DEPARTMENT OF
MECHANICAL AND AUTOMATION ENGINEERING

30TH ANNIVERSARY SPECIAL

MAJOR UPDATES WITHIN 5 YEARS

1994

- Department's Establishment (Prof. KWONG Chung Ping as Founding Chairman)

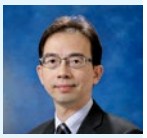
2019

- Department's 25th Anniversary

2020

- Faculty members took part in the CUHK InnoHK Centres:
  - Hong Kong Centre for Logistics Robotics (Prof. LIU Yun-Hui as Director)
  - Multi-Scale Medical Robotics Centre (Prof. AU Kwok Wai Samuel as Director)
  - Centre for Perceptual and Interactive Intelligence (Prof. YAM Yeung as Program Leader)

- Prof. LIAO Wei-Hsin succeeded Prof. WANG Changling Charlie for the appointment of Director of CUHK Institute of Intelligent Design and Manufacturing (renamed from the Institute of Precision Engineering).



2021

- Research Assessment Exercise (RAE) 2020 by University Grants Committee of Hong Kong: The overall quality in mechanical and production engineering of CUHK was the highest, up to 94%, among all universities in Hong Kong by adding both categories of 4* (world leading) and 3* (internationally excellent).

2022

- MAEG started programme-based admission (JUPAS code: JS4408) from 2022 intake.

2023

- Prof. REN Wei succeeded Prof. XU Dongyan as the Programme Director of EEEN Programme.

2024

- MAEG and EEEN started to be offered as participating major programmes from CUHK in the CUHK X CUHK (Shenzhen) – Aerospace Science and Earth Informatics and X (ASEI+X) Double Major Programme.
- Prof. CHEN Ben M. succeeded Prof. LIAO Wei-Hsin as the Department Chairman (w.e.f. 1 Aug 2024).

- Prof. AU Kwok Wai Samuel and Prof. LIU Yun-Hui received funding support for their projects from the inaugural Research, Academic and Industry Sectors One-plus Scheme (RAISe+ Scheme) of The Innovation and Technology Commission of the HKSAR Government.

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The information in this brochure covers the period from July 2021 to June 2024.

MESSAGE FROM THE VICE-CHANCELLOR

It gives me great pleasure to contribute a message to congratulate the Department of Mechanical and Automation Engineering (MAE) on its 30th anniversary.

Since its establishment in 1994, the Department has been committed to nurturing future technology innovators. Equipped with professional knowledge and a global mindset, graduates from the Department have established themselves as world-class scholars, technical leaders and well-respected entrepreneurs making remarkable contributions to society. They are eager to bring tangible benefits to the world by applying what they have learnt from the Department's meticulously designed academic programmes to advance the development of mechanical engineering, robotics, automation, energy and environmental engineering, and beyond.

The 30 years of proud history has been a result of the concerted efforts and dedication of all staff, students and alumni of the Department, who have consistently engaged themselves in multifarious education and research programmes that aim to foster global technological advancement and shape the future of engineering. As the Department reaches a significant milestone, I would like to offer my best wishes for its continuous growth as one of the best engineering departments in Asia, cultivating talents and yielding actionable knowledge and translational research outcomes that respond to the needs of the 21st century society.

Professor Rocky S. TUAN
Vice-Chancellor and President
The Chinese University of Hong Kong

MESSAGE FROM THE PROVOST

MAE at 30 exemplifies what happens when good people come together and what hard work and dedication can achieve. The Department may be relatively modest in size, but it packs a punch in providing top quality education, world-leading research, and increasingly, making a difference in innovation and commercialization of technologies. When it comes to delivering value for society, MAE is second to none. Warmest congratulations on the Department's 30th Anniversary. The best is yet to come!

Professor Alan K.L. CHAN
Provost
The Chinese University of Hong Kong

MESSAGE FROM THE FACULTY DEAN

Congratulations to the Department of Mechanical and Automation Engineering (MAE) on its 30th anniversary in 2024!

Since its inception, MAE has nurtured more than three thousand graduates, including undergraduates, masters and PhD graduates. Many of the MAE alumni are to be congratulated for their distinguished service and prominent roles in society after they graduated. The professors and students in MAE have advanced the state-of-the-art in many fields, including smart materials, biomedical engineering, robotics and automation, systems and control, unmanned/intelligent systems, autonomous vehicles, energy storage, and advanced manufacturing. I particularly commend the MAE Department for its distinguished record in the translation of academic research to real world practical use in the wider society, and the wide-reach and significant impact of its research in the wider society. MAE is truly world class, as was confirmed in the last Research Assessment Exercise conducted by an independent panel of internationally renowned expert assessors under the auspices of the government's University Grants Committee, which gave MAE the coveted top 4* (world leading) evaluation for 100% of its research impact cases. I am confident that the Department can continue to advance the state-of-the-art and help educate the next generation of engineers, entrepreneurs and leaders in society.

Professor Hon Ki TSANG
Dean
Faculty of Engineering, The Chinese University of Hong Kong

MESSAGE FROM THE CHAIRMAN OF ADVISORY COMMITTEE

On this momentous occasion of the 30th anniversary of the Department of Mechanical and Automation Engineering at The Chinese University of Hong Kong, we celebrate three decades of excellence, innovation, and dedication to the field of engineering.

Since its inception in 1994, the Department has continually strived for academic brilliance, fostering innovation and pushing the boundaries of knowledge in Asia and beyond. The commitment to academic excellence, research advancements, and industry partnerships has been instrumental in establishing a legacy of success.

Throughout the years, the Department has not only produced outstanding engineers but has also contributed significantly to the advancement of technology and society as a whole.

As we celebrate this significant milestone, I would like to express my deepest gratitude to the dedicated teaching and research staff whose unwavering commitment and expertise have been supportive in shaping the Department's success. Their pioneering approaches, innovative methodologies, and tireless efforts have significantly advanced the professional landscape of mechanical and automation engineering in Hong Kong.

I am confident that the Department of Mechanical and Automation Engineering will continue to thrive and contribute to the betterment of the engineering industry in the years to come. Here's to celebrating 30 years of excellence and to many more years of success, growth, and impactful contributions.

Ir. Hon. Siu Hung CHAN, JP
Chairman of the Advisory Committee on Mechanical and Automation Engineering
The Chinese University of Hong Kong

MESSAGE FROM FORMER DEPARTMENT CHAIR (AUG 2018 – JUL 2024)

Congratulations to the Department of Mechanical and Automation Engineering (MAE) at The Chinese University of Hong Kong (CUHK) on its 30th Anniversary. It was an honor for me to serve as the Department Chairman from August 2018 to July 2024. The MAE Department has successfully recruited high-caliber faculty members and experienced significant expansion. Over the past six years, the Department has recruited 1 Professor, 7 Assistant Professors, 9 Research Assistant Professors, and 2 Lecturers. The dedicated MAE faculty members consistently strive to deliver quality teaching and have been recognized with teaching awards, including the UGC Teaching Award 2019, CUHK Vice-Chancellor's Exemplary Teaching Award 2023, and SCGE Exemplary Teaching Award in General Education 2023. Despite challenges brought on by the COVID-19 pandemic, such as the postponement of the 2020 summer industrial training to 2021 and the need to conduct course lab experiments online, the MAE faculty members and staff have exhibited resilience and determination in overcoming these adversities. The MAE students have demonstrated exceptional performances in various competitions, securing numerous awards including the Hong Kong Robocon Championship in 2018, 2019, 2022, 2023, and 2024, the ABU Asia-Pacific Robot Contest Grand Prix in 2019, 2022, and 2024, the Best Design Award at the ASME Student Design Competition 2019, and the Champion at the IMechE Greater China Design Competition 2019. In the Professor Charles K. Kao Student Creativity Awards 2023, MAE students claimed 9 out of 15 awards, including 3 Champions out of 4. Other notable achievements include the Red Dot Award: Design Concept 2022 and the James Dyson Award 2023 - International Sustainability Award.

The MAE faculty members have achieved remarkable success in securing external grants. They have also spearheaded the establishment of two Hong Kong InnoAIR Centres in medical and logistics robotics. Faculty members and alumni from the MAE Department have garnered numerous prestigious awards on a global scale, attesting to their significant contributions to society. Some recent accolades include the Falling Walls Science Breakthroughs of the Year 2023, the R&D 100 Award, the ASME Leonardo Da Vinci Award 2023, the Xplorer Prize 2021, as well as winning 7 Gold and 8 Silver Medals at Inventions of Geneva between 2019-2024. In addition, two faculty members were honored with the RGC Research Fellowship in the academic years 2021-22 and 2022-23, respectively. The research findings from the Department have been published in esteemed journals such as *Science, Science Robotics, Nature Materials, Nature Sustainability*, and other reputable engineering journals. Furthermore, more than 10 start-up companies founded by MAE faculty members and students have received support from the Technology Start-up Support Scheme for Universities (TSSSU). Two of them, Cornerstone Robotics Ltd. and LaSense Technology, were recognized as winners of the Deloitte Hong Kong Rising Star award.

I would like to take this opportunity to express my sincerest gratitude to former chairmen and all colleagues for their dedication to advancing the Department over the past three decades. Under the leadership of our current Chairman, Prof. Ben M Chen, I am confident that the MAE Department will continue to thrive and succeed.

Professor Wei-Hsin LIAO
Choh-Ming Li Professor of Mechanical and Automation Engineering

MESSAGE FROM THE DEPARTMENT CHAIR (AUG 2024 –)

Over the past three decades, the Department of Mechanical and Automation Engineering (MAE) at The Chinese University of Hong Kong (CUHK) has evolved into a hub for cutting-edge research, transformative education, and impactful community engagement. Our achievements are the collective result of the dedication, creativity, and hard work of our faculty, students, alumni, and staff. With the leadership of former Department Chairmen, we have together built a vibrant academic environment where knowledge meets real-world application and where future leaders in engineering are nurtured.

CUHK MAE is home to two forward-looking undergraduate programmes: the BEng in Mechanical and Automation Engineering and the BEng in Energy and Environmental Engineering. These programmes provide students with a solid foundation in mechanical principles, automation technologies, and sustainable energy solutions, equipping them to lead in fields ranging from robotics to environmental management. A testament to this is our students' consistent success in Robocon, both locally and internationally, with our teams once again securing the Champion and First-Runner Up in the 2024 Hong Kong contest and the Championship at the ABU Asia-Pacific Robot Contest (ABU Robocon) held recently in Vietnam this year. Through a rigorous curriculum, hands-on learning opportunities, and a strong emphasis on innovation, we prepare our students to make significant contributions to society.

Our dynamic faculty members are at the forefront of pioneering research in areas such as advanced manufacturing, energy and environmental technologies, smart materials, biomedical engineering, robotics and automation, systems and control, and unmanned systems with smart city applications. Among our many achievements, it is particularly noteworthy that in the 2020 Research Assessment Exercise (RAE), all of our impact cases received the highest possible rating, highlighting their outstanding contributions to the field. CUHK's mechanical and production engineering discipline has been recognized as the best among all universities in Hong Kong. Additionally, our faculty members play key roles in the InnoHK Centres funded by the Innovation and Technology Commission (ITC), and we excelled in the recent ITC RAISe+ funding scheme, with two of the seven CUHK projects awarded originating from MAE.

I would like to take this opportunity to extend my heartfelt thanks to all our faculty, staff, and alumni, whose successes and contributions bring pride to our department and inspire future generations. I also wish to express my gratitude to our advisory committee, industry partners, and collaborators, whose support has been instrumental in our achievements.

Finally, to our students, I encourage you to embrace the opportunities that lie ahead. You are the engineers and innovators of the future, and your journey with us is just the beginning of a lifelong adventure in learning and discovery. We are here to support you every step of the way.

As we celebrate our 30th anniversary, let us continue to work together to uphold the values of excellence, innovation, and integrity that have always defined MAE at CUHK. I look forward to our department's continued success and the bright future that lies ahead.

Professor Ben M. CHEN
Chair of Department of Mechanical and Automation Engineering

MESSAGE FROM THE EEEN PROGRAMME DIRECTOR

I am honored to reflect on our remarkable journey and the significant impact our MAE department has made over the past three decades. Established under the department, the Energy and Environmental Engineering Programme (EEEN) represents a pivotal chapter in our history. Created in response to the growing global demand for sustainable solutions, our programme was designed to equip students with the skills and knowledge needed to address the urgent challenges of climate change, energy sustainability, and environmental protection.

The government's recent announcements of the Clean Air Plan for Hong Kong 2035 and Climate Action Plan 2050 underscore the importance of the work we are doing. These initiatives highlight the critical need for expertise in energy and environmental engineering as Hong Kong advances toward its goal of carbon neutrality and a sustainable future. Our department and programme are committed to contributing to these goals by fostering innovation, advancing research, and producing graduates who are equipped to lead in this vital area.

With three specialized streams—Sustainable Energy Technology, Green Building Technology, and Environmental Engineering—we prepare our graduates to become leaders in these critical fields. Our alumni have gone on to excel in diverse and impactful careers, taking on roles as ESG engineers, consultants, and analysts, as well as mechanical, construction, and IT engineers, and business and technology consultants. Their achievements are a source of immense pride for us and a clear indication of the quality and relevance of the education. They are the driving force behind the continued success and reputation of our department and programme.

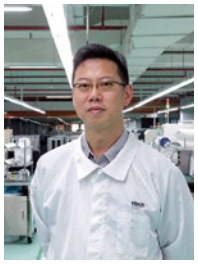
Looking ahead, we remain committed to pushing the boundaries of what is possible in mechanical, automation, energy and environmental engineering. Together, we will continue to innovate, educate, and lead the way towards a more sustainable and prosperous future.

Happy 30th Anniversary to MAE Department!

Professor Wei REN
Director
Energy and Environmental Engineering Programme

MESSAGES FROM GRADUATES

MAE / ACE GRADUATES



Mr. WONG Chun Yu
BEng in MAE (1997)

Manufacturing Manager, VTech

As one of the pioneering graduates from the inaugural MAE programme in 1997, I've witnessed the department's growth firsthand. From a small class of around 30 students, it has blossomed into a hub of scientific research and academic excellence. Let's celebrate the achievements of the past three decades and look forward to an exciting future. May the department continue to innovate, explore cutting-edge technologies, and lead the way in robotics, control systems, computer vision, and artificial intelligence, etc. Here's to another 30 years of success, camaraderie, and technological advancement!

Mr. WONG Kwun Yun
BEng in MAE (1997)

Senior Technical Purchaser, OneSpan Solutions UK Limited

Congratulations to MAE Department on its 30th anniversary since its establishment in 1994!

MAE offers more than the classical mechanics courses expected, which include rudimentary electrical/electronic theory, industrial automation, computer networks, and artificial intelligence, etc., which are prevalent nowadays and versatile enough to cover many engineering aspects to broaden the engineering mindset. Hitherto, I find these skills still useful when we work collaboratively with others in their specific engineering fields or even manage people. I gained more than anticipated from MAE, which keeps me abreast of engineering trends.

Ir. Prof. LAM Alan Hiu Fung, JP
BEng in MAE (1999);
MPhil in ACE (2001);
PhD in ACE (2004)

Chairman of Sengital Group and CEO of Gravity Capital Partners

Congratulations to the MAE Department on reaching this remarkable 30-year milestone! It is an honor to celebrate the department's dedication to excellence in engineering education and research. Over the years, MAE has been instrumental in shaping innovative minds and fostering a spirit of discovery and collaboration. As an alumnus, I am proud of the department's achievements and its commitment to nurturing future leaders in the field. May this anniversary be a testament to the hard work and passion of the faculty, students, and staff. Here's to continued success and groundbreaking advancements in the years to come.

Dr. FOK Lo Ming Crystal
BEng in MAE (2000);
MPhil in ACE (2002);
PhD in ACE (2009)

Director of AI Applications, Cyberport Hong Kong

Congratulations to the MAE Department on your 30th anniversary! Over the past three decades, your pioneering work in research has been influential in shaping the industry. By cultivating a talented pool of engineers and researchers, you have fueled innovation and driven transformative advancements.

Your commitment to translating cutting-edge ideas into practical technologies has yielded significant results. From enhanced robotics to assistive technologies, the real-world impact of your research is evident across diverse sectors. This unwavering focus on bridging the gap between research and application has solidified the department's reputation as a driving force in various fields.

I applaud your visionary work and look forward to the next chapter of pioneering achievements. Cheers to 30 more years of excellence!

Prof. LAI Wai Chiu King
BEng in MAE (2000);
MPhil in MAE (2002);
PhD in MAE (2005)

Associate Professor, City University of Hong Kong

Cheers to 30 years of incredible work! Congratulations to success and reputation to next new milestone!

Prof. LEI Kin Fong Thomas
MPhil in ACE (2000);
PhD in MAE (2005)

Professor in BME and Dean for International Affairs,
Chang Gung University, Taiwan

As a MAE alumnus, I am filled with pride and joy to congratulate our department on its 30th anniversary. For three decades, MAE has provided world-class education. The achievements of our faculty, students, and alumni are a reflection of the robust academic foundation and the cutting-edge research environment that MAE provides. I am grateful for the invaluable experiences and knowledge gained during my time at MAE, which have been instrumental in shaping my professional journey. I am certain countless other alumni share this sentiment, and we all celebrate this milestone together.

Dr. FUNG Wai-keung
PhD in MAE (2001)

Senior Lecturer in Electronics, Robotics and Control Engineering, Field Group Chair in Robotics

Cardiff Metropolitan University, Cardiff, Wales, UK

Happy 30th anniversary to the MAE Department! It's been an honour and a pleasure to be part of the development of the department. I joined the graduate programme in 1996 under the supervision of Prof. Yunhui Liu. I sincerely thank MAE for the excellent training and resources provided which laid a solid foundation for me to continue my research and teaching career.

Prof. CHEN Zhiyong
MPhil in ACE (2002);
PhD in ACE (2005)

Professor, The University of Newcastle

Studying at the MAE Department for five years to earn both MPhil and PhD degrees profoundly shaped my knowledge and professionalism. It served as a strong foundation for my career and life, opening windows to the external world and the realm of knowledge. I deeply appreciate the invaluable insights, skills, and networks gained during this transformative journey. This experience equipped me with expertise in my field and instilled a commitment to lifelong learning and growth. I am grateful for the opportunities and perspectives it provided, paving the way for a fulfilling and impactful professional journey.

Dr. LIANG Jian
PhD in MAE (2006)

Principal Manager - Research & Ecosystems, CLP Holdings Limited

Time flies, and it has been over 20 years since I started my PhD studies in MAE in 2003. It was a precious memory and period full of friendship and happiness. In particular, I had great opportunities to study in a young and energetic department with valuable guidance from various knowledgeable professors and research experience from multiple projects, which formed a solid foundation for my life and future development. On this 30th anniversary, I would like to wish MAE everything the best, continuing to be an energetic and creative department alongside the world-leading research pathway.

Dr. LUO Yilun
MPhil in ACE (2006)

Staff Researcher, General Motors Global Technical Center

Congratulations on MAE's 30th anniversary! Honored to study and graduate in ACE as the start of my research career. And lucky to be mentored by my amazing advisor and professors!

Mr. PENG Biao
BEng in ACE (2008)

Senior Manager - IT Audit, Asia Pacific, Chanel Limited

Congratulations on the 30th anniversary of MAE! I am always proud to be a student and alumnus. Wish the Department continued success for many more years of inspiring greatness!

Ir. WONG Kai Man Teresa
BEng in ACE (2009)

Director and Founder, JAM Island Theatre / JAM Island Edu & Arts Tech Ltd.

Congratulations on reaching the remarkable milestone of the 30th anniversary of the Department of Mechanical and Automation Engineering! As an alumna, I am proud to witness the growth and achievements of the MAE Department. The skills I developed in problem-solving, along with the comprehensive knowledge I gained from the programme, have equipped me to apply engineering concepts in real-world scenarios and shape my future. Your commitment to excellence continues to inspire countless students and professionals. Here's to many more years of success and groundbreaking advancements!

Mr. CHAN Kin Lun
BEng in ACE (2010)

Director, APlus IT Service Limited

I graduated in 2010, majoring in the automation stream. After graduation, I engaged in science and technology education work until 2016, when I founded APlus IT Service Limited. Our focus is on the crossover between information technology and interior design, designing and building smart offices and smart homes for users, utilizing automation technology to improve people's lives and applying the knowledge I gained during my studies in practical ways.

Mr. LO Wai Chong Danny
BEng in MAE (2011)

Head of Site Management and Services, Hong Kong Aircraft Engineering Company Limited (HAECO)

Congratulations on MAE's 30th anniversary! As an alumnus, I am thrilled to see how far you have come. My undergraduate degree in Mechanical and Automation Engineering laid a solid foundation for my professional journey. The comprehensive curriculum and exceptional faculty nurtured my skills and knowledge, enabling me to excel in my role at HAECO. Thank you for empowering me with the expertise and confidence to soar to new heights in my career.

Ms. WONG Wing Yee Winnie
BEng in MAE (2011)

Facilities Manager, Jones Lang LaSalle

Congratulations, MAE! As an alumna, I'm proud to be part of this remarkable journey. From gears to robotics, you've shaped engineers who innovate, design, and transform the world. Here's to three decades of excellence!

Dr. DAI Jingwen
PhD in MAE (2012)

Co-Founder & CTO, Guangdong Virtual Reality Technology Co., Ltd. (Ximmerse)

I deeply cherish my three years as a PhD student in the MAE programme, as during this period, I gradually developed skills that are crucial for entrepreneurship and have benefited me throughout my life. Firstly, through rigorous scientific methods, I cultivated the ability to identify, analyze, and solve problems. Secondly, I built resilience and the capacity to handle complex and challenging tasks independently. Lastly, I enhanced both my oral presentation and written communication skills.

Prof. LI Zheng
PhD in MAE (2013)

Associate Professor,
The Chinese University of Hong Kong

As we come together today to commemorate the 30th anniversary of our esteemed department, I am overwhelmed with a profound sense of joy and pride. Having been part of this extraordinary journey, from my days as a PhD student to now, witnessing the remarkable expansion and flourishing of our department, has been an absolute honor. Looking ahead, I am filled with anticipation and excitement for what the future holds. I am confident that our department will continue to thrive, pushing boundaries, and scaling new heights of academic and research excellence. Happy 30th Anniversary!

Dr. ZHOU Xi
PhD in MAE (2015)

Senior Mechatronic Engineer, ASML

Thanks to my five years of study in the MAE Department, I gained knowledge of emerging semiconductor manufacturing technologies and entered the semiconductor industry. This experience has been invaluable in broadening my horizons and allowing me to practice the necessary skills to thrive in my career.

Mr. CHU Ki Sum
BEng in MAE (2015)

Technology Director and Co-founder, MTcure BioTech Limited

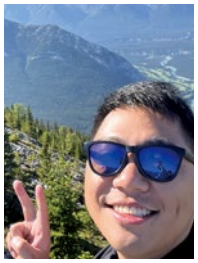
My learning experience at MAE was transformative. It provided a rigorous platform to deepen my understanding of engineering. I chose to study at MAE primarily because of its strong reputation for fostering innovation and entrepreneurship, which aligns perfectly with my aspiration to establish a technology startup.

During my studies, I honed my skills and creativity in product development. I learned to navigate the complexities of problem-solving and design. MAE's interdisciplinary approach and emphasis on practical applications equipped me with the knowledge and networks necessary to turn my vision into reality. Happy 30th anniversary, MAE!

Mr. KWAN Lok Bond
BEng in MAE (2016)

Project Engineer, Airport Authority Hong Kong

Time flies, and it has been nearly a decade since I graduated from the MAE Department. In my current role, which focuses on numerous autonomous systems, including the automated parking system utilizing Automated Guided Vehicles, the solid fundamental knowledge I gained from MAE courses has proven useful in tackling the associated engineering challenges. While I am proud to see MAE continue to shine academically over the past decade with excellent achievements, I wish the department all the best for more successful years to come!



Mr. YIP Kwan Yi
BEng in MAE (2018)

Mechanical Engineer, Acculogic Inc.

Congratulations on MAE's 30th anniversary! I am very grateful for the invaluable knowledge and opportunities I received as an alumnus. Best wishes for continued success and many more achievements in the years to come!

Mr. KAN Kwok Ching
MSc in MAE (2020)

Data Center Operations Engineer, Amazon Data Services Hong Kong Limited

The master's programme in MAE has inspired me with a wealth of knowledge, including automation, Python, and AI training skills, which I did not know much about prior to the programme. This was a major factor that I decided to join one of the leading AI companies in the world, AWS.

Miss LEE Ka Ki
BEng in MAE (2023)

Graduate Engineer, Airport Authority Hong Kong

Congratulations to the MAE Department on the 30th anniversary! The knowledge and skills I gained during my studies have been invaluable in my career. I cherish the experiences and connections I built during my time in the programme. Here's to the future of MAE — may it continue to thrive and inspire future generations of engineers! Cheers to the next 30 years!

EEEN GRADUATES

Miss YEUNG Sze Hang
BEng in EEEN (2022)

Engineer, ATAL Building Services Engineering Limited

Congratulations on MAE's 30th anniversary! Thank you for providing us with the autonomy and support to pursue our dreams. The opportunities here have prepared me to participate in a leading industry project—the Digital Twin. Going forward, I will continue to make substantial contributions by applying what I've learned at MAE to better our community. I am grateful to be part of this remarkable legacy.

Miss IP Pui Ki
BEng in EEEN (2022)

Engineering Trainee, Schneider Electric (Hong Kong) Limited

My sincere congratulations on MAE's 30th anniversary! My time as an EEEN student was inspiring. Especially during the industrial training, I gained a deep understanding of power systems and a passion for digital transformation. I am currently working as an engineering trainee and using my expertise to enhance building management systems. Additionally, in order to create a more environmentally friendly future, one of my tasks is to promote energy-efficient products to potential customers. Without the department, I may not have been able to shape my profession.

Mr. CHEUNG King Ho
BEng in EEEN (2023)

Graduate Engineer, Veolia Hong Kong Holding Limited

Happy 30th anniversary! As a graduate in Energy and Environmental Engineering, I am grateful for the interdisciplinary teaching approach provided by the MAE Department. The department's dedication to hands-on learning has equipped me to succeed in my waste management position today. Throughout the four years, various coursework and internship opportunities ignited my passion for pursuing a greener future with my fellow classmates. My career has been made possible by MAE's commitment to excellence.

Mr. CHOI Wai Chung
BEng in EEEN (2023)

Graduate Engineer, ATAL Building Services Engineering Limited

Happy 30th anniversary to the MAE Department, my second home! After completing the EEEN programme, I have always been mindful of the wonderful teachers and students I had the opportunity to interact with. The department has equipped me for the challenges of the real world with its dedication to creating a dynamic learning environment. As a graduate E&M engineer, I am able to apply what I have learned during practical projects and industrial training to real-world practices. I have become a responsible and innovative engineer, equipped to take on the world's energy challenges, thanks to MAE's commitment to excellence.

Mr. CHEN Zhenxi
BEng in EEEN (2023)

Graduate Engineer, ATAL Building Services Engineering Limited

What a wonderful 30th anniversary! As an EEEN graduate, I will always be appreciative of MAE's priceless imparting of knowledge and skills. In fact, the coursework and lab sessions created an atmosphere that was favourable for knowledge exchange and personal growth. After four years of learning technical and soft skills in the department, I am prepared to solve problems in the energy management industry. I am now working as a recent graduate at an E&M contractor, where I excel in tasks including solar energy integration and retro-commissioning. MAE's dedication to environmental protection resonates deeply with my purpose in the sustainable field. I wish it continued success in shaping the next generation of engineering leaders.

Miss KOO Kin Yee
BEng in EEEN (2023)

Graduate Environmental Consultant, Mott MacDonald Hong Kong Limited

A heartfelt congratulations on MAE's 30th anniversary! My time in the EEEN programme was truly transformative. Although I graduated some time ago, I will never forget how the professors constantly challenged us on the concept of sustainability. Thanks to the robust curriculum, I am equipped with the skills to perform ecological monitoring on site. With a deep understanding of environmental protection principles, I am prepared to tackle environmental issues in the field. In fact, I am proud to be an alumna and look forward to seeing the department's continued impact on education.

Miss SUARLY Laurentia Issabel
BEng in EEEN (2023)

Graduate Engineer, Veolia Hong Kong Holding Limited

Happy 30th anniversary, MAE! My time at EEEN was life-changing and went beyond academics. As an international student, the welcoming atmosphere encouraged me to enjoy learning and collaborating with locals on various group projects. My enthusiasm for decarbonisation was sparked by the department's commitment to sustainability. I'm currently using my knowledge to tackle real waste management challenges as an engineering trainee. From optimizing leachate management to designing sustainable landfills, I believe my skills are contributing to a cleaner future. I'm grateful for the foundation the department provided and the opportunity to make a positive impact.

Miss LAI Tsz Ying
BEng in EEEN (2024)

Graduate Trainee, ATAL Building Services Engineering Limited

Can you recall those late-night study sessions before the mid-term and final exams? Those were the good old days at CUHK! Time flies indeed, but one thing remains: all those thermodynamics equations and late nights actually paid off. Dear professors and classmates, now I am a graduate engineer, assisting in different RCx and renewable projects. Who knew those "impossible" assignments would prepare me to wrangle real-world challenges? Thanks, MAE Department and EEEN programme, for the tough love and the career path that's way more fun than I ever imagined (and a lot less coffee-fuelled). Happy 30th Anniversary!

FACULTY MEMBERS

PROF. AU KWOK WAI SAMUEL

Professor
Director of Multi-Scale Medical Robotics Center (MRC)

Research Interests:

- Medical Robotics
- Bioinspired Robotics
- Control System Design
- Mechatronics System Development

PROF. CHEN FEI

Assistant Professor

Research Interests:

- Robot Learning
- Robot Grasping and Manipulation
- Human-robot Collaboration
- Embodied AI for Humanoid Robots

PROF. CHEN BEN M.

Professor
Department Chair and Graduate Division Head

Research Interests:

- Control Applications
- Unmanned Systems Technologies and Applications
- Digital Twins
- Smart Cities

PROF. CHEN SHIH-CHI

Professor

Research Interests:

- Ultrafast Laser Fabrication
- Light Microscopy & Spectroscopy
- Precision Engineering
- Microsystem Design

PROF. CHEN CHUN

Associate Professor

Research Interests:

- Built Environment and Energy
- Airborne Particle Modeling
- Advanced Air Filtration Technology
- Smart Indoor Air Quality Control

PROF. CHEN XI

Research Assistant Professor

Research Interests:

- Green Building
- Renewable Application in Buildings
- Built Environment Modeling
- Smart Inspection

PROF. CHEN YUE

Vice-Chancellor Assistant Professor

Research Interests:

- Trustworthy AI
- Optimization and Control
- Smart Grids
- Electric Vehicle

PROF. HE QIGUANG

Assistant Professor

Research Interests:

- Smart Materials and Structures
- Soft Robotics
- Mechanical Metamaterials
- Physical Intelligence

PROF. CHENG SHING SHIN

Associate Professor

Research Interests:

- Flexible Miniature Robots
- Image-guided Robotic Surgery
- Soft Actuators and Sensors
- AI Applications in Medical Robotics

PROF. HUANG JIE

Choh-Ming Li Research Professor of Mechanical and Automation Engineering
Associate Dean (Research)

Research Interests:

- Systems and Control
- Guidance and Control of Flight Vehicles
- Robotics and Automation
- Game Theory and Its Applications

PROF. FANG GUOXIN

Assistant Professor

Research Interests:

- Geometry Computing
- Computational Design
- Advanced Manufacturing
- Robotics

PROF. KWOK KA WAI

Professor

Research Interests:

- Surgical Robotics
- Intra-operative Medical Imaging Processing
- Control and Intelligent Systems

DR. HAN DONGKUN

Lecturer

Research Interests:

- Engineering General Education
- Cooperative Control of Multi-agent Systems
- Robustness of Uncertain Systems
- Stability of Nonlinear Systems

PROF. LAU DARWIN TAT MING

Associate Professor
Assistant Dean (Student Affairs)

Research Interests:

- Cable-Driven Robot Mechanisms
- Dynamics and Control
- Biomechatronics
- Building Construction Robots
- Human-robot Interaction and Teleoperation

DR. LAU SIU HONG ALEX

Lecturer

Research Interests:

- Animal Flight Aerodynamics
- Computational and Theoretical Aeroacoustics

PROF. LIU XIAOHUA

Research Assistant Professor

Research Interests:

- Micro/nano Structures Fabrication
- Glass Molding and Mold Fabrication
- Wearable Flexible Electronic Sensor

PROF. LI CHENGLIN

Research Assistant Professor

Research Interests:

- Precision Engineering
- Mechanical Design
- Nanomanufacturing
- Metrology

PROF. LIU YUN-HUI

Choh-Ming Li Professor of Mechanical and Automation Engineering
Director of CUHK T Stone Robotics Institute (CURI)
Director of Hong Kong Centre for Logistics Robotics (HKCLR)

Research Interests:

- Robotics
- Machine Intelligence and Artificial Intelligence
- Human-robot Interactions
- Biomedical Engineering

DR. LI YIYANG

Senior Lecturer

Research Interests:

- Structural Health Monitoring
- Noise and Vibration Control
- Algorithm Optimization
- Smart Structures

PROF. LU YI-CHUN

Professor
Vice-Chair (Graduate)
MSc Programme Director

Research Interests:

- Energy Storage and Utilization
- Batteries & Fuel Cells
- Redox Flow Batteries
- Energy Storage for Electric Vehicles & Micro-Grid

PROF. LIAO WEI-HSIN

Choh-Ming Li Professor of Mechanical and Automation Engineering
Director of Institute of Intelligent Design and Manufacturing, CUHK

Research Interests:

- Smart Materials and Adaptive Structures
- Energy Harvesting and Vibration Control
- Intelligent Design and Manufacturing
- 3D/4D Printing
- Mechatronics and Exoskeleton

PROF. MA XIN

Research Assistant Professor

Research Interests:

- Robotics and Automation
- Computer Vision
- Medical Robot
- Unmanned Aerial Vehicle
- Sensors and Actuators

DR. PAN ZINI

Lecturer

Research Interests:

- Cooperative Control
- Networked Systems
- Multi-agent Systems

PROF. WANG JIANGLIU

Research Assistant Professor

Research Interests:

- Computer Vision
- Surgical Robotics
- Medical Image Analysis
- Video Understanding

PROF. REN WEI

Professor
EEEN Programme Director
Assistant Dean (Research)

Research Interests:

- Optical Sensing
- Laser Spectroscopy
- Environmental Monitoring
- Combustion and Propulsion

PROF. WANG ZHEN

Research Assistant Professor

Research Interests:

- Ultrasensitive Gas Sensing
- Photoacoustic/photothermal Spectroscopy
- Cavity-enhanced Absorption Spectroscopy
- Quantum/interband Cascade Laser Characterization and Application

PROF. SONG XIN

Research Assistant Professor

Research Interests:

- Micro/nano robotics
- Medical Robotics
- Biomaterials

PROF. XU DONGYAN

Professor

Research Interests:

- Nanoscale Thermal Transport
- Boiling Heat Transfer for Electronic Cooling
- Thermal Energy Harvesting Materials and Devices
- Flexible Tactile and Thermal Sensing

PROF. SONG XU

Assistant Professor

Research Interests:

- Design for Additive Manufacturing
- 3D-Printing Processes
- Metamaterials by Design

PROF. XU YANGSHENG

Professor of Automation and Computer-Aided Engineering

Research Interests:

- Robotics
- Dynamics and Control
- Human Interface
- Intelligent Vehicles

PROF. XU YUNJIAN

Associate Professor

Research Interests:

- Stochastic Optimal Control
- Safe/robust Reinforcement Learning
- Power System Optimization and Control
- Mechanism Design for Electricity Markets

PROF. ZHANG LI

Professor

Research Interests:

- Small-scale Robotics and Intelligent Systems
- Medical Miniature Robots and Platforms
- Robot Swarm/Collective at Small Scales
- Functional Materials, Sensors and Actuators for Robotics and Intelligent Systems
- Translational Biomedicine and Minimally Invasive Intervention

PROF. YAM YEUNG

Research Professor
Director of CUHK Shenzhen Research Institute (SZRI)

Research Interests:

- Intelligent Systems
- Computational Control
- Smart Manufacturing
- Surgical Robotics

PROF. ZHANG WEIZHAO

Assistant Professor

Research Interests:

- Fiber-Reinforced Polymer Composites
- Advanced Manufacturing
- Integrated Computational Material Engineering
- Computational Mechanics

PROF. YANG CHAOYU

Research Assistant Professor

Research Interests:

- Microfluidics
- Microrobots
- Nature-inspired Engineering
- Wettability

PROF. ZHOU JIANSHU

Research Assistant Professor

Research Interests:

- Robotics
- Robotic Hands
- Robotic Grasping and Manipulation

PROF. YUAN HAIDONG

Associate Professor

Research Interests:

- Dynamical System and Control Theory
- Modeling and Control of Systems at Micro, Nano and Mesoscopic Scale
- Quantum Information and Quantum Computing
- Complex Systems and Networks

TECHNOLOGY TRANSFER

UNMANNED AERIAL SYSTEM (UAS) AND AI DRIVEN HIGH EFFICIENCY AND PRECISION BUILT ASSET INSPECTION AND MANAGEMENT

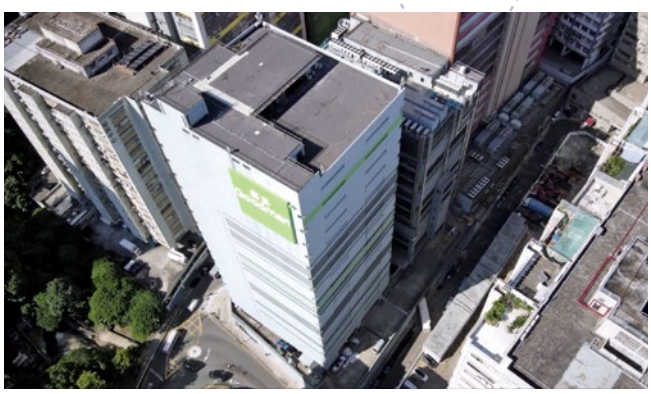
Prof. CHEN Ben M.

Collaboration

China Resources Logistics (Group) Limited
Goodman Hong Kong Logistics Partnership (GHKLP)

Description

This project can greatly contribute to the knowledge transfer via commercial venture development. The project creates a startup (i.e. CU-Craft Limited) to develop and provide cutting-edge technology solutions for the unmanned aerial system and AI-driven high-performance digitized management of built environment under the Smart City 2.0 framework. The startup can provide uniquely designed drones and software platforms related to specialized and intelligent drones as



well as contract services covering built assets inspection, site reconstruction and management, environment survey and monitoring, as well as facility management. CU-Craft has already started providing solutions to industrial partners, such as China Resources Logistics (Group) Limited and Goodman Hong Kong Logistics Partnership (GHKLP).

DEVELOPMENT OF INTELLIGENT ROBOTS FOR OBJECT SORTING

Prof. CHEN Fei

Collaboration

SOTA Robotics (HK) Limited

Description

SOTA Robotics (HK) Limited, a spin-off company from Prof. CHEN Fei's lab and CUHK, develops an innovative robotic waste sorting system employing a high-precision delta robot to efficiently categorize and separate various types of waste materials. This advanced system utilizes computer vision and machine learning algorithms to identify and classify different waste objects, such as metals, plastics, and municipal solid wastes. The rapid and accurate movements of the robot allow for swift picking and tossing of items into appropriate

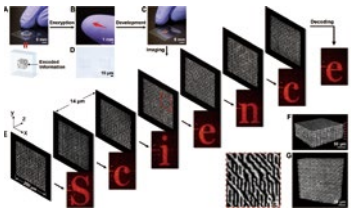
recycling streams. This automated solution not only increases sorting efficiency and accuracy but also reduces human exposure to potentially hazardous materials. By integrating this technology into waste management facilities, the company can significantly improve recycling rates, minimize landfill usage, and contribute to a more sustainable circular economy.

NEXT GENERATION HIGH-DENSITY 3D OPTICAL STORAGE PLATFORM BASED ON ULTRAFAST LASERS

Prof. CHEN Shih-Chi

Collaboration
Diffractive Technology Holding Co. Limited

Description
This project develops an ultrahigh density 3D optical storage device (~5 petabit/cm^3) and parallel optical writing and reading systems based on digital holography and temporal focusing, which can achieve a data writing/reading rate of 50 and 80 megabit/sec respectively. In the Internet era, data storage technologies are critically important to support the rapid development of information processing and storage, and an economic, robust, high-density and high-speed 3D optical storage solution may fundamentally address the ever-growing challenges. In this project, we have achieved ultrafast multi-focus laser writing (with 5000 laser foci at 10 kHz) via the combination of digital holography and ultrafast lasers. Fast optical read-out is realized via 3D temporal focusing microscopy that generates optical cross-sections at 1000 fps. Based on the platform, we have studied and optimized different storage media including fused silica, PMMA-based polymers, ion-doped glasses and hydrogels. By exploiting laser intensity and phase, multi-level optical storage is being achieved to further enhance the storage density. Lastly, volume-shrinkable hydrogel substrates are applied to achieve ultrahigh density writing and physical data encryption.



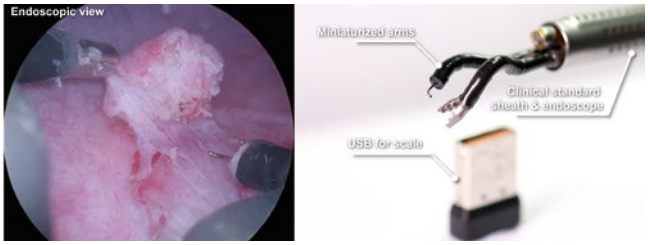
The image was published in Science:
F. Han, S. Gu, A. Klimas, N. Zhao, Y. Zhao, and S. Chen, "3D Nanofabrication via Ultrafast Laser Patterning and Kinetically-regulated Material Assembly," Science, Vol. 378, No. 6626, pp. 1325-1331, 2022.

ULTRA-THIN FLEXIBLE ROBOTIC INSTRUMENTS FOR ENDOLUMINAL SURGERY

Prof. KWOK Ka Wai

Collaboration
Agilis Robotics Limited

Description
Collaborating with Agilis Robotics co-founded by Prof. Kwok, the project aims to develop fully flexible robotic instruments with cutting edge mechanical architecture for incisionless endoluminal surgery. The system is designed with miniaturized robotic tools that are compatible with conventional endoscope working channels, to perform endoscopic submucosal dissection (ESD) along gastrointestinal tract and en bloc resection of bladder tumour (ERBT) for treating early-stage cancers. The robotic system seamlessly integrates into existing endoscopy facilities and surgical procedures adopted in hospitals. Improvements in instrument dexterity and intuitiveness in manipulation brought by the system drastically reduce learning curve associated with endoscopic surgery, striving to provide clinicians with the next-generation of minimally invasive instruments for more effective and affordable early-stage care for patients.



WALL-R BUILDING WINDOW CLEANING ROBOT

Prof. LAU Darwin Tat Ming

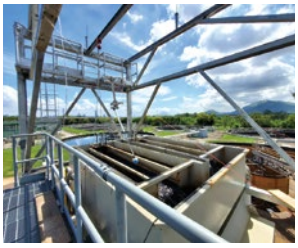
Collaboration
Chun Wo Construction & Engineering Company Limited

Description
Construction is one of Hong Kong's core industries where labour shortage is negatively impacting the industry. Operations on high-rise building façades, for example, window cleaning and façade painting, are in desperate need of automated solutions to relieve the labour shortage. Currently, gondola systems carrying the human workers are used to perform the required tasks. Dangerous and harsh working conditions (high heat, wind and rain), extended working periods and high insurance costs result in a lack of skilled workers and high labour costs.

In this project, a hybrid cable-driven robot with robot arms to autonomously perform window cleaning and façade painting was developed. The system is unique in that the dexterity of robot arms is combined with the cable-driven robot's ability to operate in large distances. Furthermore, it cleaning is performed with wipers and painting is performed with rollers in the same manner as human workers and can even operate on surfaces that are not completely flat.

LAMELLA-CBOT: LAMELLA PLATE CLEANING ROBOT

Prof. LAU Darwin Tat Ming



Collaboration

Drainage Services Department, HKSAR Government

Description

At sewage treatment facilities with sedimentation tanks, lamella plates can be installed in order to increase the efficiency of sedimentation to separate the sludge and waste water. It is anticipated that after a long period of operation, the sludge would be aggregate on the lamella plates. Manual cleaning of the lamella plates for sedimentation tanks poses to be a laborious, harsh and dangerous job for human workers. To eliminate such risks, a robotic solution is developed to automate the cleaning of lamella plates for sedimentation tanks without the need of human workers to be involved. The system developed is a type of cable-driven parallel robot, with bespoke cleaning end-effector, fail-safe and operating software, designed for the particular application. Beyond the design and development, the robot was pilot tested on a final sedimentation tank at the Stanley Sewage Treatment Works and testing primary sedimentation tank at the Yuen Long Sewage Treatment Works.

HYDROPONICS ROBOT SYSTEM

Prof. LAU Darwin Tat Ming

Collaboration

Agriculture, Fisheries and Conservation Department, HKSAR Government
Prof. Jimmy H. M. Lee, Department of Computer Sciences and Engineering, CUHK
Dr. Anthony K. W. Sum, Department of Computer Sciences and Engineering, CUHK

Description

In this project, an autonomous robotic system for operations within indoor clean-room horticulture farms was developed and deployed. The system is responsible for automated seeding onto growing trays, delivery of trays between the nurturing racks and collecting station, and the software management system for the workflow of the automated farm. By implementing an automated system, this would relieve the laborious human tasks within the farm, and also lower the risks of bringing undesired insects or contamination into the clean room. The system is deployed at the Controlled Environment Hydroponic Research and Development Centre (CEHRDC) at the Vegetable Marketing Organisation.

3D IMAGING SENSOR

Prof. LIU Yun-Hui

Collaboration

DepthVision Limited

Description

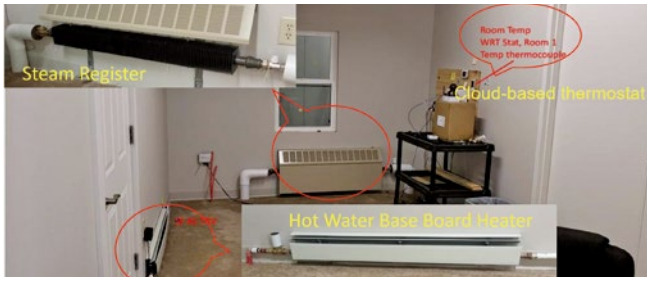
DepthVision Limited is a pioneering technology company specializing in high-end 3D imaging sensors and 3D AI vision solutions. It was founded in 2021 with headquarter in Hong Kong, and technical and marketing offices in Shenzhen and Changsha. The company has a strong technical R&D team, which brings together well-known professors and PhD graduates from the CUHK. The team has been deeply involved in 3D sensing and perception for many years and is committed to becoming an industry leader in 3D vision in China. The company's products are widely used in scenarios such as visual inspection and robot guidance in construction, automotive manufacturing, robotics, lithium batteries, 3C, logistics, and other industries.

DEEP REINFORCEMENT LEARNING (DRL) BASED CONTROL MODULES

Prof. XU Yunjian

Collaboration
Computime Limited

Description
In collaboration with the Computime Limited, we develop deep reinforcement learning (DRL) based control modules to automatically control the temperature setting of cloud-based thermostats for residential customers. Field test with hundreds of residential customers with radiant heating systems in Europe and the U.S. showed that the developed



DRL algorithms lead to more than 20% energy saving and enhancement of customer satisfaction. The innovative smart thermostat control is under commercialization and has led to one US patent. (see the picture above on the test of the developed control scheme in our industrial partner's lab)

ROBOTIC ENDOSCOPIC PLATFORM FOR PERFORMANCE OF ADVANCED ENDOLUMINAL SURGERY

Prof. YAM Yeung

Collaboration
Multi-scale Medical Robotics Center (MRC)

Description
This project aims to develop a high manoeuvrable dual-arm endoscopic surgical robotic platform for sophisticated surgical procedures with high accuracy and increased surgical safety and success rate. By introducing flexible robotic manipulators through the working channel of an endoscope to reach the site of interest, surgical procedures are performed without the need for creating an opening in the patients' body, greatly reducing the pain and speeding up recovery. The two flexible robotic manipulators include a lifter and a dissector for tissue retraction and tissue dissection, respectively. Comparing to conventional procedures, this platform creates triangulation

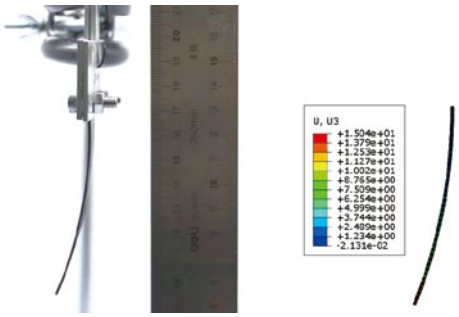
between different tools for more working space, creates more tissue tension for effective dissection, and decouples camera motion for a stable point of view. This platform has been tested to perform Endoscopic Submucosal Dissection (ESD) in the live porcine models. There were no bleeding and no perforation in all trials. The operation time was reduced by 2-3 times, comparing to using conventional tools. The project serves to enhance the development of a proof-of-concept robotic endoscope for endoscopic surgery and marks a new milestone in technological advancement for cancer surgery.

MULTISCALE MODELING AND HOMOGENIZATION FOR THERMAL-MECHANICAL PROPERTIES OF CARBON FIBER REINFORCED THERMOSET POLYMERS DURING CURING PROCESS

Prof. ZHANG Weizhao

Collaboration
The Commercial Aircraft Corporation of China, Ltd. (COMAC)

Description
This project involves numerical modeling and virtual characterization for the thermal-chemical-mechanical performance of a toughened carbon fiber reinforced thermoset composites and its laminates throughout the curing process. This composite is specifically designed for aerospace and aviation applications. Thus far, the composite, in both single layer and laminates, and its thermoset resin have been successfully measured and numerically modeled



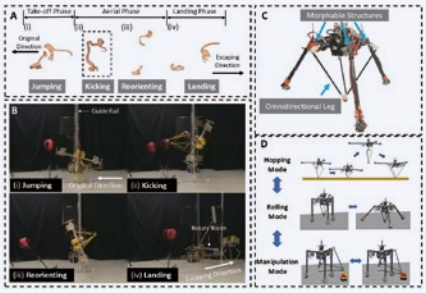
with high accuracy. Up-till-now, the project has reached multiple key milestones, including one software copyright currently under review and publication of one research paper, additionally with one software copyright and two papers currently in progress. The collaboration with COMAC has been highly productive, and the project outcome has great potential to further the field of advanced materials in aerospace applications.

HIGHLIGHTED PROJECTS

WHEN TRANSFORMER MEETS KUNG FU: A LEGGED ROBOT THAT CAN FLIP, KICK, AND TRANSFORM TO A MULTI-MODE PLATFORM

Prof. AU Kwok Wai Samuel

This project aims to investigate performing agile motions in legged locomotion. Our lab has a close collaboration with biologists who provide extensive insights into animal agile motions, especially the interaction between kangaroo rats (k-rats) and rattlesnakes (Fig. A). Inspired by those, we propose and design a novel robot, called Bruce to respect Kung Fu star Bruce Lee and his famous Bruce Lee flying kick. Bruce can kick an "enemy" in the air, which greatly mimics the escaping behaviour of k-rats once attacked by a snake (Fig. B). We also extend Bruce to a "Transformer" via morphable structures (Fig. C). When a transformer meets Kung Fu, such a legged robot is expected to show both agility and multi-functionality (Fig. D).



AERIAL-MARINE COLLABORATIVE HETEROGENEOUS MULTI-AGENT SYSTEMS WITH DIGITAL TWIN TECHNOLOGY FOR SMART OCEANS

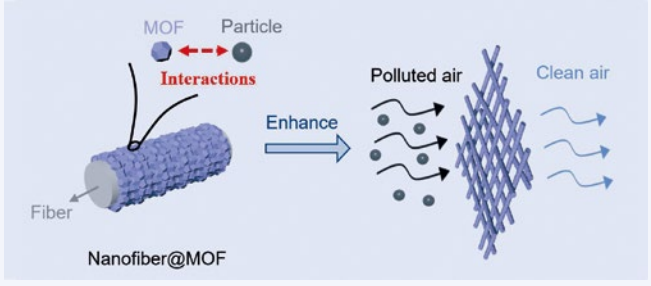
Prof. CHEN Ben M.

This project aims to develop an innovative solution for search and coverage to navigate through complicated ocean environments. This approach leverages the active sensing capabilities of multi-robot systems to supplement digital twin model, offering a more comprehensive and real-time understanding of the environment. Based on point cloud data, which are inherently non-convex and unstructured, this method efficiently generates collision-free Voronoi regions using only local sensing information through spatial decomposition and spherical mirroring techniques. A deadlock-aware guided map integrated with a gradient-optimized and centroid Voronoi-based coverage control policy is constructed to improve efficiency by avoiding exhaustive searches and local sensing pitfalls. In addition, dynamic connectivity maintenance method is designed, aiming to enhance multi-robot coordination, maximize coverage efficiency, and hasten marine target detection.

SMART AND EFFICIENT CONTROL OF AIRBORNE PARTICLES IN BUILT ENVIRONMENTS

Prof. CHEN Chun

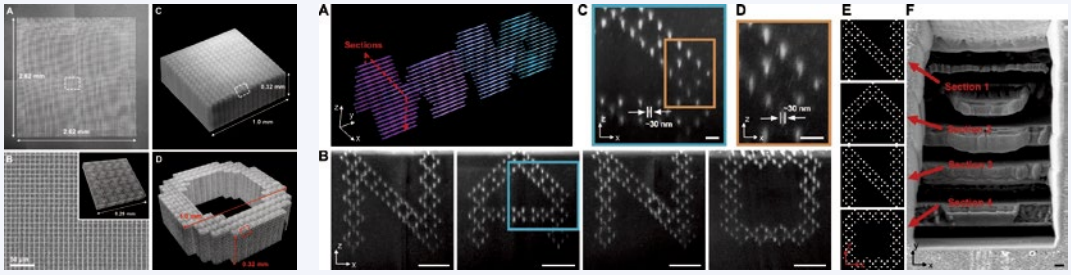
Extensive efforts have been made in smart and efficient control of airborne particles in built environments such as buildings and transportation vehicles. We develop advanced nanofiber air filters using the electrospinning technique to lower the air resistance of air filters, so that we will have high-efficiency air cleaning devices for airborne particle removal. We develop faster-than-real-time simulation algorithms to predict the transport of airborne particles in built environments, which can be used for online control of indoor particles with information from the digital twin. We develop reinforcement learning algorithms to smartly control indoor particles while maintaining good thermal comfort with less energy consumption to promote health and sustainability.



HIGH-THROUGHPUT FABRICATION PLATFORMS FOR SUBMICRON SCALE OPTICAL COMPONENTS AND PHOTONIC DEVICES

Prof. CHEN Shih-Chi

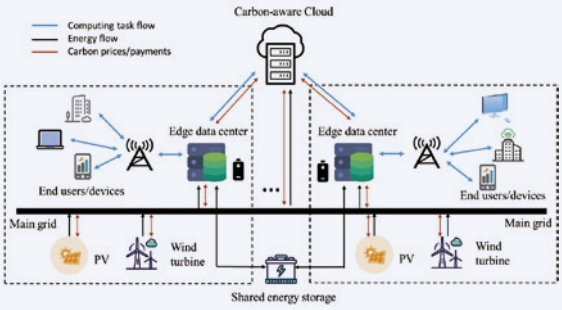
This ITF supported project developed two high-throughput fabrication platforms for large-scale production of 2D and 3D optical components and photonic devices, achieving a resolution of 20 nm, based on our femtosecond light-sheet 3D printing system, which presently holds the world record in printing resolution (140 nm) and speed (100 mm^3/hr). The first platform combines the light sheet system with micro-molding processes to offer low-cost high-precision (~200 nm) solutions to custom-fabricate various optical components, e.g., microlenses and diffractive optical elements, for industrial scale applications. The second platform combines the light sheet system with implosion fabrication, where 2D and 3D structures of selected materials, e.g., metals and semiconductors, are deposited in expanded hydrogels through two-photon processes, followed by a 1000 - 27,000-time volume shrinkage, leading to a fundamentally new solution to perform multi-material 3D printing at 20 nm resolution. Metamaterial structures, e.g., metalenses and split-ring resonator for visible light applications, have been designed and fabricated to demonstrate the efficacy of the platform. The results substantially improve the throughput and quality of nanofabrication.



HIERARCHICAL CARBON-CENTRIC ENERGY MANAGEMENT SYSTEM FOR ENERGY STORAGE-ASSISTED DATA CENTERS

Prof. CHEN Yue

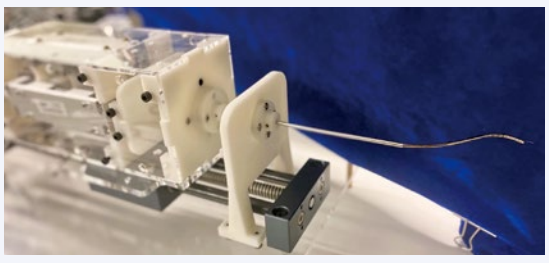
The project aims to tackle the growing carbon footprint of data centers. A hierarchical carbon-centric data center energy management system is constructed. Firstly, we improve the carbon efficiency of individual edge data centers by addressing the volatility of their local renewables. An online algorithm is developed to co-optimize computing task assignment and energy utilization. Secondly, we improve the carbon efficiency of regional data center clusters leveraging the fact that aggregate renewable power across a region is more predictable. A computing workload and energy co-sharing approach is developed to achieve the best tradeoff between reduced emission and lower computing latency. Lastly, we improve the carbon efficiency of the overall system by coordinating cloud and edge data center operations with well-designed prices.



FOLLOW-THE-LEADER CONTINUUM ROBOTIC CANNULA FOR INTRACEREBRAL HEMORRHAGE EVACUATION

Prof. CHENG Shing Shin

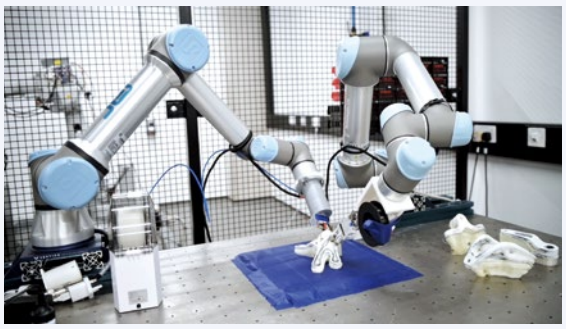
A continuum robotic cannula, consisting of a precurved body and a 2-degree-of-freedom (DoF) flexible tip, monolithically fabricated has been developed to enable nonlinear trajectory access towards the intracerebral hemorrhage (ICH) and dexterous distal manipulation for more complete ICH evacuation. Dedicated design optimization and motion planning algorithms enable the follow-the-leader (FTL) motion of the cannula. Simulated results show the ability of the cannula to travel along a preplanned curved trajectory with submillimeter shape deviation. The motion capability of the robotic cannula was further experimentally proven in a brain-like gelatin phantom.



MULTI-AXIS ADDITIVE MANUFACTURING WITH FUNCTIONAL MATERIALS

Prof. FANG Guoxin

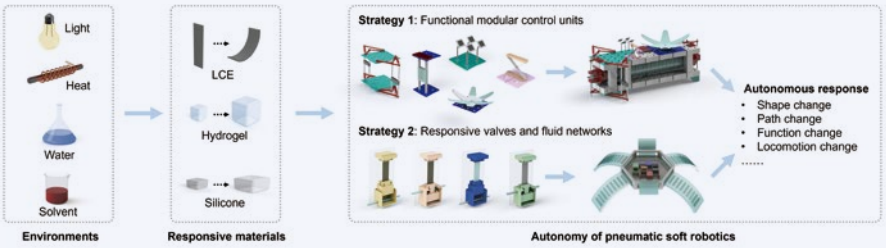
Prof. FANG Guoxin's research group focuses on developing theoretical foundations and computational tools that will shape the future of enriched intelligence in robots and manufacturing systems. His team incorporates robotic arms with high DOFs into additive manufacturing systems, creating the advantage of spatial alignment of materials (metal, polymer, composites, biomaterial, etc.) rather than conventional planar-based processes. This enables multi-functionality in the printed products (e.g., support-free and reinforcement), and his team is working on both software and hardware development of the system. The image presents the use of a dual-robot arm system to print continuous carbon fiber composites that aligns fibers with complex 3D stress directions. By using the same amount of material, the printed model generated by topology optimization withstands 6x more force and is 2.3x stiffer than the model printed in a planar way.



EMBODIED AND DISTRIBUTED PHYSICAL INTELLIGENCE FOR PNEUMATIC SOFT ROBOTS

Prof. HE Qiguang

Pneumatic soft robots exhibit unique features, including exceptional adaptability and versatile locomotion modes. However, to interact with environments, these robots rely on conventional mechatronics to construct a "sensing, control, actuation" feedback loop. These electronics are rigid, bulky, and incompatible with soft materials. In this project, inspired by the biological structures, we develop a novel strategy to achieve autonomy for pneumatic soft robots, whose sensing, control, and actuation are embodied and distributed in their physical bodies. Specifically, we will design functional control modules and intelligent valves based on multiple 3D-printed stimuli-responsive materials. These materials enable the robots to sense and respond to various and distinct environmental stimuli, causing autonomous changes in robotics' function, trajectory, morphology, and function.

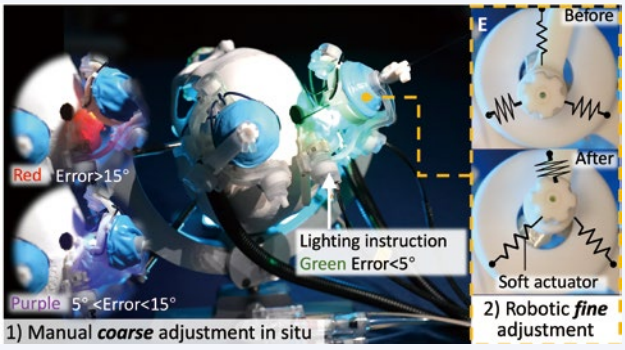


MRI-GUIDED SURGICAL ROBOT SYSTEMS FOR PERCUTANEOUS AND STEREOTACTIC INTERVENTIONS

Prof. KWOK Ka Wai

Magnetic resonance imaging (MRI) has demonstrated its unique and superior advantages for interventional procedures, such as high soft-tissue contrast, zero ionizing radiation. Besides, MR thermometry can provide precise (<1°C) and real-time temperature monitoring for ablation.

MRI-guided robotic systems leveraging on these advantages have drawn increasing attention, for improvements in surgical instruments manipulation precision, and intervention efficacy. However, there are still technical challenges to be hurdled. This project is to develop robotic systems to overcome these obstacles, targeting to be applied in various interventions, e.g. percutaneous spine injections/ liver ablation, and stereotactic neurosurgery. They could be manipulated within confined workspace of imaging coil, high-intensity magnetic and radiofrequency fields generated by MRI scanner, as well as MR-based real-time tracking of instruments.



ROBOTAPPER: HAMMER TAPPING ROBOT FOR FAÇADE INSPECTION

Prof. LAU Darwin Tat Ming

RoboTapper is an innovative lightweight and easy to set up solution for inspection and maintaining facade surfaces. Suspended by cable from a mobile robot at the rooftop of buildings, the tapping robot maneuvers on the façade surface to perform physical hammer tapping. The presence of defects is identified by analysing the sound of the tapping using artificial intelligence (AI). The RoboTapper aims to improve worker safety by eliminating working at height and improve inspection quality with digital tracing to protect both workers and the general public to meet the demands of the Hong Kong society. The positive benefits have been demonstrated through over 20 real-world building inspections using RoboTapper.

WEARABLE EXOSKELETON FOR LOAD TRANSPORTATION

Prof. LIAO Wei-Hsin

Robotic exoskeletons are devices for motion assistance of mobility impaired patients and motor ability augmentation of healthy people. Considering the interactive action between exoskeletons and human body, a safe and comfortable human-exoskeleton interaction is essential to achieve effective exoskeleton operations for human motion assistance. Low back pain is a common musculoskeletal disorder caused or made worse by the exposure of high spinal loads during repetitive manual lifting tasks. Our invention of wearable back support exoskeletons provides personalized assistance to the wearer when moving heavy objects to reduce back strain and muscle activity, and hence minimize the risk of low back pain while maximizing comfort and safety. This project won Gold Medal at the 49th International Exhibition of Inventions Geneva 2024.

TUMBLER INSPECTION BALL ROBOT

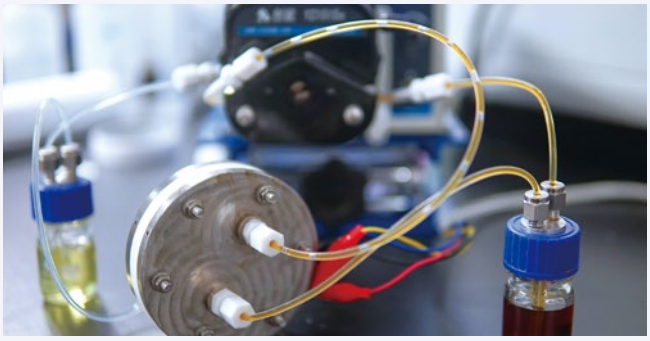
Prof. LIU Yun-Hui

Co-developed with the Drainage Services Department (DSD), the Tumbler Inspection Ball (TIB) Robot is specifically designed for underground sewage tunnel inspections, which can withstand strong currents and remain upright, eliminating the risk of capsizing. The robot is equipped with an integrated stabilizing system and utilizes AI applications to capture crystal-clear 360-degree panoramic videos and provide precise positioning data, enabling drainage service personnel to assess pipeline conditions with utmost clarity using computers, and facilitating prompt maintenance arrangements. The groundbreaking invention was honored with a gold award at the 2024 Geneva International Invention Exhibition.

SAFE AND HIGH-ENERGY-DENSITY AQUEOUS BATTERIES

Prof. LU Yi-Chun

The widespread and deep penetration of renewable energy relies on low-cost and efficient energy storage technologies. Prof. LU Yi-Chun's research group has been working on the forefront of safe and clean energy storage with strong commercialization potentials. We have demonstrated a high-voltage aqueous battery using low-cost and eco-friendly molecular crowding electrolytes and low-cost and long-life polysulfide redox flow batteries. Owing to its inherent safe feature (water based) and high energy density, these results have strong potentials in commercialization.



ULTRASENSITIVE OPTICAL GAS SENSING TECHNOLOGY

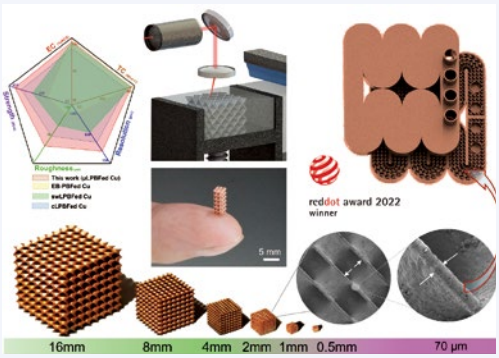
Prof. REN Wei

Our goal is to develop novel spectroscopic techniques for trace gas sensing, to innovate laser diagnostics for environmental monitoring and industrial process control, and to understand the fundamental processes in energy and biomedicine. We have innovated laser spectroscopic techniques with artificial intelligence to achieve ultrasensitive, ultra-dynamic-range and online gas detection. Our research to date has resulted in more than 130 peer-reviewed journal publications and 10 US and Chinese patents. Our techniques have allowed direct applications to exhaust monitoring in power plants, petrochemical industries, and patient breath analysis. These sensors are expected to further contribute to the next-generation sensing systems required for robotics and smart city. LaSense Technology, founded as a spin-off company from our laboratory, stands as a pioneering high-tech startup focused on innovating laser-based gas sensing technology. The company's flagship product, the high-precision greenhouse analyzer, has been adopted by industrial parks and environmental protection departments.

MICRO LASER POWDER BED FUSION OF PURE COPPER FOR HIGH-PERFORMANCE FREEFORM HEAT EXCHANGERS

Prof. SONG Xu

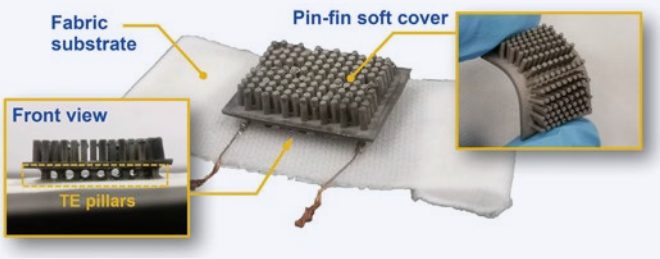
The advancement of additive manufacturing enables the fabrication of copper components with complex geometry, which provides freeform design to many industry applications, a notable example is heat exchangers (HXs). Micro Laser powder bed fusion (μLPBF) of copper is employed to overcome the technical difficulties such as the high reflection of infrared laser and high thermal conductivity. With the combinations of fine beam (25μm), fine powders (0~25μm) and thin layer thickness (10μm), μLPBF can achieve full-dense microscale pure copper components with International Annealed Copper Standard conductivity > 96%, and yield strength > 200MPa. Such improvement in printing resolution and strength have overcome the restrictions of traditional HXs, allowing for the development of high-performance freeform compact HXs made from pure copper.



SOFT-COVERED WEARABLE THERMOELECTRIC DEVICE FOR BODY HEAT HARVESTING AND ON-SKIN COOLING

Prof. XU Dongyan

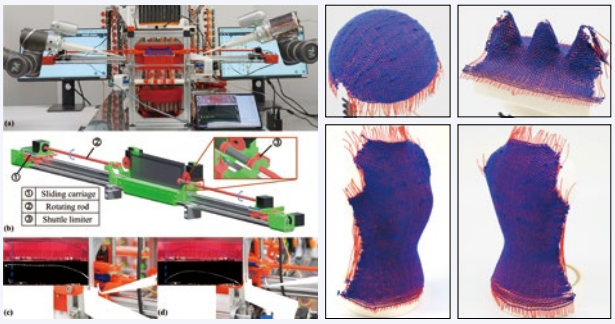
The recent advance of self-powered wearable electronics gives rise to a growing demand for flexible, sustainable, and portable power supply. We develop a wearable thermoelectric device (WTED) for body heat harvesting and on-skin cooling, which demonstrates the desirable performance and wearer comfort. Systematic theoretical and finite element analysis was conducted to optimize the output power and wearability of the soft-covered WTED. The optimized WTED achieves a power density of 6.63 μW cm^{-2} on a stationary human body under natural convection condition with an ambient temperature of 20°C, which is higher than the previously reported WTEDs with flat soft covers made of high-thermal-conductivity elastomers. Furthermore, our WTED can realize a 1.5°C temperature drop for the human skin through Peltier cooling. This work demonstrates a new route to develop soft-covered WTEDs for self-powered wearable electronics and personal thermoregulation.



AI-BASED PERSONALIZED DESIGN AND FABRICATION

Prof. YAM Yeung

The project focuses on the research of 3D human modelling, parametric design, prototyping and non-traditional materials fabrication. A Full-Scale 3D Human Body Scanner in the laboratory allows full body digitization of human subject with 0.2mm precision to support the formulation and analysis of a wide range of 3D human modelling schemes. The digital human can then serve as an avatar for virtual reality applications. Furthermore, going from digital human to personalized wearable fabrication, algorithms are developed to transform the target geometric shape into special representation map. Upon encoding, such map can be converted into knitting instructions map or weaving map for machine execution. The project has independently developed an in-house 3D weaving machine that innovates both software and hardware and supports non-traditional materials weaving. Potential applications are being explored for the advance mechanical property and capabilities facilitated by the 3D weaving fabrication on non-traditional materials.



AI-ASSISTED MICROROBOTIC PLATFORM FOR MINIMALLY INVASIVE INTERVENTIONS

Prof. ZHANG Li

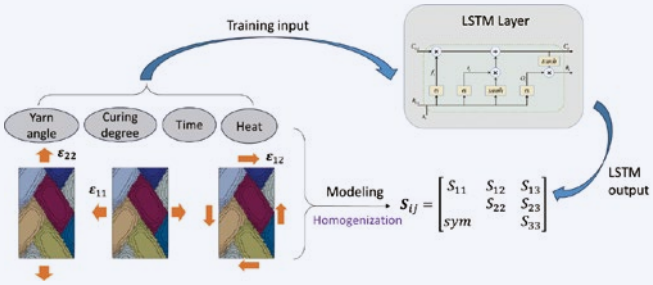
Prof. ZHANG Li has been granted HKD26.69 million by the Research Grants Council (RGC) Strategic Topics Grant (STG) 2023/24 to support this five-year research project.

To apply AI to miniature robots for minimally invasive interventions, the project will address the challenges of integrating AI and microrobotics research, including control, imaging, performance in dynamic physiological conditions, and appropriate autonomy for intervention. The advanced technology and the outcomes from this joint research project will significantly contribute to Hong Kong, particularly in the emerging field of AI and medical miniature robots for minimally invasive medicine. The project team, composed of engineering experts and medical professionals from CUHK, HKU, CityU, PolyU, NTU LKCMedicine, and ETH Zurich.

INVESTIGATING AND PREDICTING PREFORMING EFFECTS ON CURING OF WOVEN CARBON FIBER REINFORCED POLYMER COMPOSITES

Prof. ZHANG Weizhao

This project aims to investigate and predict preforming effects on curing of woven carbon fiber reinforced plastics (CFRPs). The major challenge is to precisely include the preformed fabric architecture in curing modeling for CFRPs with significant temperature- and deformation-path-dependent properties. To tackle this challenge, the research team has developed an advanced multiscale and multi-step modeling method to predict chemical-thermal-mechanical coupled behaviors of preformed CFRPs during curing. An innovative non-contact measurement platform has also been established for thermal expansion and chemical shrinkage of highly creep resin and fiber yarns under curing conditions. The research has resulted in world-leading prediction accuracy for curing-induced deformation of polymer resin and its CFRPs, assisting optimization for manufacturing of lightweight CFRP structures with complex 3D geometry.



FEATURE AWARDS

THE CUHK ROBOCON TEAM

ABOUT THE CUHK ROBOCON TEAM

The CUHK Robocon team has participated in the Robocon Hong Kong Contest since 2004. The team builds robots to complete competition specified-tasks, where students solve engineering problems by developing innovative ideas.

Currently, the team is comprised mainly of students from Mechanical and Automation Engineering (MAE), Electronic Engineering (EE), Computer Science and Engineering (CSE), and the Faculty of Medicine, while others come from various faculties and departments.

2022

Robocon 2022 Hong Kong Contest

The CUHK team "Golden Striker" clinched the **Championship** and the **Best Team Spirit Award**, while the other CUHK team "Power Builder" received the **3rd Runner-up**.

Golden Striker – Team Members:
NG Pui Hin, SHEA Yi Yui, NG Hui Yin, CHOW Tsun Yu, WONG Ching Yan, FENG Yalei, CHAN Siu Ting, WONG Chi Ka, KWOK Lam Him, SHEK Tsz Him, YEUNG Yuk Lun, MAN Tui Dor, CHAN Yi Man, CHEUNG So Yee, TONG Tsz Hin (Co-instructor), FAN Chun Yin (Co-instructor) & YIP Chun Wa (Instructor)

Power Builder – Team Members:
NG Mei Ki, KIM Keunyoung, KIM Seungwon, HO Meng Xi, YU Ka Hin, KU Tsz Yui, LAM Ping Sum, LAM Wing Choi, TAI Long Kwan Jeffrey, CHAU Sen Yu, DING Chun Yeung, WANG Jiaqi, WONG Chun Hin, WAI Chun Kit, WU Ka Long, TONG Tsz Hin (Co-instructor), FAN Chun Yin (Co-instructor) & YIP Chun Wa (Instructor)

THE ASIA-PACIFIC BROADCASTING UNION (ABU) ASIA-PACIFIC ROBOT CONTEST 2022 – INDIA

The CUHK robotics team won the **Grand Prix Award** at the Asia-Pacific Broadcasting Union's Asia-Pacific Robot Contest (ABU Robocon) 2022, which was held online in New Delhi, India with 13 regional winning teams from universities, colleges and academies in 12 countries and territories across the Asia-Pacific region competing in the final.

Since ABU Robocon's inception in 2002, CUHK robotics team has advanced to five finals (2016, 2019, 2020, 2021 and 2022) of this international trophy, and in 2019 became the first Hong Kong team to win the championship. In 2022, it was the second time CUHK took the award.

Team Members:
NG Pui Hin, SHEA Yi Yui, NG Hui Yin, CHOW Tsun Yu, WONG Ching Yan, NG Mei Ki, YU Ka Hin, KU Tsz Yui, CHAN Yi Man, LAM Ping Sum, LAM Wing Choi, YEUNG Yuk Lun, MAN Tui Dor, DING Chun Yeung, CHAU Sen Yu, WANG Jiaqi, KWOK Lam Him, SHEK Tsz Him, WONG Chun Hin, WAI Chun Kit, FENG Yalei, CHAN Siu Ting, WONG Chi Ka, WU Ka Long, CHEUNG So Yee, TONG Tsz Hin (Co-instructor), FAN Chun Yin (Co-instructor), WONG Fei Yan Fiat (Co-instructor) & YIP Chun Wa (Instructor)

2023

Robocon 2023 Hong Kong Contest

The CUHK team "The Lord of the Rings" won the **Championship** and the **Best Engineering Award**, while the other team "Ring Slinger" received the 3rd Runner-up.

The Lord of the Rings – Team Members:
KU Tsz Yui, KWOK Lam Him, LAM Wing Choi, CHAN Yi Man, YEUNG Yuk Lun, MAN Tui Dor, DING Chun Yeung, WAI Chun Kit, WONG Chun Hin, FENG Yalei, CHAN Siu Ting, WONG Chi Ka, WU Ka Long, SHEA Yi Yui (Co-instructor), FAN Chun Yin (Co-instructor), WONG Fei Yan Fiat (Co-instructor), NG Pui Hin (Co-instructor) & YIP Chun Wa (Instructor)

Ring Slinger – Team Members:
NGAN Ka Fai, KIM Seungwon, LEE Pak Ho, KWONG Ka Kiu, CHING Wing Yan, CHEN Zhenghang, CHIM Ho Yin, FAN Chun Ho, ZHANG Yixin, LI Tsz Yeung, NGAN Wing Lam, MUHANDIRUMGE Lakindu Lehan Lithpura, LIN Yat Fai, LAU Tsun Shing, CHENG Shui Kwong, KWOK Ka Ming, LIU Shi Pang, WONG Chu Hei, CHAN Cody, NG Wai Nam, SHEA Yi Yui (Co-instructor), FAN Chun Yin (Co-instructor), WONG Fei Yan Fiat (Co-instructor), NG Pui Hin (Co-instructor) & YIP Chun Wa (Instructor)

THE ASIA-PACIFIC BROADCASTING UNION (ABU) ASIA-PACIFIC ROBOT CONTEST 2023 – CAMBODIA

After two consecutive years (2021-2022) of the ABU Robocon being held virtually due to the pandemic, the CUHK robotics team was thrilled to participate in the contest in person, showcasing their technical prowess and innovative designs on the international stage in Phnom Penh, Cambodia. The CUHK team seized the moment with remarkable skills and determination, culminating in their outstanding performances, which earned them the **1st Runner-up** and the **Best Design Award** at the ABU Robocon 2023.

Team Members:
KU Tsz Yui, NGAN Ka Fai, LEE Pak Ho, KWONG Ka Kiu, CHING Wing Yan, KWOK Lam Him, LAM Wing Choi, CHAN Yi Man, LIN Yat Fai, CHENG Shui Kwong, YEUNG Yuk Lun, MAN Tui Dor, CHEN Zhenghang, CHIM Ho Yin, FAN Chun Ho, LI Tsz Yeung, WONG Chun Hin, WONG Chu Hei, FENG Yalei, CHAN Siu Ting, WONG Chi Ka, WU Ka Long, CHAN Cody, NG Wai Nam, FAN Chun Yin (Co-instructor), WONG Fei Yan Fiat (Co-instructor), NG Pui Hin (Co-instructor), SHEA Yi Yui (Co-instructor) & YIP Chun Wa (Instructor)

2024

Robocon 2024 Hong Kong Contest

The theme of the 2024 contest, "Harvest Day", drew inspiration from the terraced fields of Vietnam. Participating teams were required to design and manufacture both manual and fully automated robots, as well as employ machine learning models, to complete the task of harvesting rice.

The CUHK teams, "Wonder Seed" and "Golden Farmer", demonstrated their exceptional capabilities by achieving remarkable success at the Robocon 2024 Hong Kong Contest, which featured elements of artificial intelligence. "Wonder Seed" clinched the **Championship** and the **Best Presenter Award**, while the "Golden Farmer" earned the **First Runner-up** and the **Best Performance Award**.

Wonder Seed – Team Members:
FUNG Cheuk Kiu, LAM Kiu Yu, LUI Siu Hing, KWONG Ka Kiu, KU Tsz Yui, LEUNG Wing Hei, LIU Chi Wang, JIANG Yin Hang, LI Chun Yan, WONG Man Tung, CHIM Ho Yin, LEUNG Ho Chun, LIN Yat Fai, CHAN Yi Man, LAM Wing Choi, WU Ka Long, CHAN Cody, WONG Chi Ka, CHAN Siu Ting, FENG Yalei, NG Pui Hin (Co-instructor), WONG Fei Yan Fiat (Co-instructor), KWOK Lam Him (Co-instructor), SHEA Yi Yui (Co-instructor) & YIP Chun Wa (Instructor)

Golden Farmer – Team Members:
FUNG Ho Yat Aaron, NGAN Ka Fai, LEE Pak Ho, XIE Ka Hin, CHAN Ka Wing, XIONG Qian, LI Ho Yin, ZHANG Yixin, LUI Kiu Sing, FAN Chun Ho, LI Tsz Yeung, TANG Cheuk Hin, LAM Tsz Kin, LEUNG Yau Ming, CHENG Shui Kwong, TSE Hui Tung, CHEN Yuk San, LAI Cheok Kwan, WONG Tin Long, SHEK Tsz Him, WONG Chun Hin, LEE Kit Ching, NG Wai Nam, NG Pui Hin (Co-instructor), WONG Fei Yan Fiat (Co-instructor), KWOK Lam Him (Co-instructor), SHEA Yi Yui (Co-instructor) & YIP Chun Wa (Instructor)

THE ASIA-PACIFIC BROADCASTING UNION (ABU) ASIA-PACIFIC ROBOT CONTEST 2024 – VIETNAM

The CUHK robotics team "Wonder Seed" was selected to represent Hong Kong in the ABU Robocon, held in Quảng Ninh, Vietnam, after winning the Robocon 2024 Hong Kong Contest.

The team leveraged computer vision and artificial intelligence this year, significantly boosting the precision and reliability of their robots. Team members swiftly collected and annotated over 10,000 photos on the day before the contest. This data was promptly utilised to refine the AI model, providing on-the-fly improvements to the automation algorithm.

Despite intense competition, the CUHK team won the **Championship** and the **Best Design Award** at the ABU Robocon 2024 after defeating 12 teams from 11 countries and regions. This was the third time the CUHK team won the championship title, following its successes in 2019 and 2022.

Team Members:
LEE Pak Ho, KU Tsz Yui, NGAN Ka Fai, FUNG Ho Yat Aaron, FUNG Cheuk Kiu Ryan, LAM Kiu Yu Tracy, LUI Siu Hing Steven, WONG Fei Yan Fiat, NG Pui Hin, CHEUNG So Yee, KWOK Lam Him, LI Tsz Yeung, WONG Man Tung, FAN Chun Ho, LUI Kiu Sing, LI Ho Yin Leo, LI Chun Yan, CHIM Ho Yin, JIANG Yin Hang, XIONG Qian Shirley, LEUNG Ho Chun, LAM Wing Choi, CHENG Shui Kwong, LEUNG Yau Ming, TANG Cheuk Hin, LEUNG Wing Hei, LIU Chi Wang Wilson, SHEK Tsz Him, LAI Cheok Kwan Chester, WONG Chun Hin, LEE Kit Ching Trevor, CHAN Cody, FENG Yalei, CHAN Siu Ting, WONG Chi Ka, WU Ka Long, SHEA Yi Yui (Co-Instructor) & YIP Chun Wa (Instructor)

THE INTERNATIONAL EXHIBITION OF INVENTIONS OF GENEVA

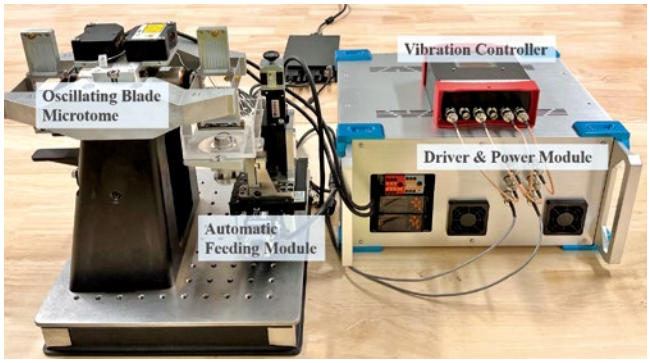
ABOUT THE EXHIBITION

The International Exhibition of Inventions of Geneva is the largest global exhibition devoted exclusively to inventions. All entries have been evaluated by an international jury of specialists.

INTERNATIONAL EXHIBITION OF INVENTIONS OF GENEVA 2022

Gold Medal: Ultrafast Oscillating Blade Microtome
This new oscillating blade microtome enables the precise sectioning of various ultrasoft tissues, fresh tissues and fixed whole organs that were hard to process before. Sectioning of soft tissues is achieved by exploiting the viscoelastic effect, i.e., the tissue self-stiffens at high frequency. This invention can help solve key challenges in novel bio-imaging applications, creating huge market value for pathology and biophotonics industries.

Principal Investigator: Prof. CHEN Shih-Chi



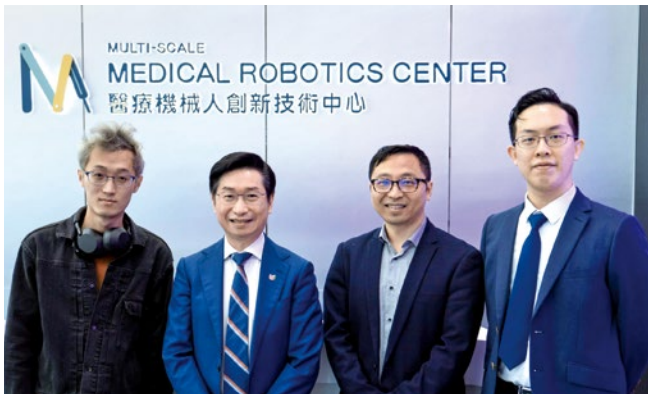
Silver Medal: Cable-driven Inspection Robot for High-rise Building Façade
Principal Investigator: Prof. LAU Darwin Tat Ming

Silver Medal: CU-Brick Robotic Brick Construction Robot
Principal Investigators: Prof. LAU Darwin Tat Ming, Prof. YAM Yeung & Prof. Adam FINGRUT (School of Architecture)

INTERNATIONAL EXHIBITION OF INVENTIONS OF GENEVA 2023

1. Gold Medal with Congratulation of the Jury: RefluxChip – a Miniature, Battery-free Remote Sensing System for Real-Time Monitoring of Gastroesophageal Reflux Disease
A miniature, battery-free remote sensing system with an extended detection period for real-time monitoring of GERD in a non-invasive, inexpensive fashion.

Principal Investigator & Team Members:
Prof. ZHANG Li (MAE Department), Prof. Philip CHIU Wai Yan (Department of Surgery), Prof. CHAN Kai Fung (Chow Yuk Ho Technology Centre for Innovative Medicine) & Mr. ZHANG Chong (Department of Biomedical Engineering)



2. Gold Medal: Self-healing Magnetic Slime Robot for Non-invasive Endoluminal Intervention in the Gastrointestinal System
A soft robot that can navigate in tiny or tortuous lumens, perform various functions, and has great potential in minimally invasive endoluminal intervention.

Principal Investigator & Team Members:
Prof. ZHANG Li, Dr. SUN Mengmeng, Mr. LIU Wai Shing (MAE Department), Prof. Philip CHIU Wai Yan (Department of Surgery) & Prof. CHAN Kai Fung (Chow Yuk Ho Technology Centre for Innovative Medicine)

3. Silver Medal: Femtosecond Projection NanoPrinter
Principal Investigator & Team Members:
Prof. CHEN Shih-Chi, Mr. Charudatta DATAR, Dr. ZHONG Qiuyuan, Dr. HAN Fei & Mr. GU Songyun (MAE Department)

4. Silver Medal: A Semi-autonomous Transperineal Prostate Biopsy Robotic System with Minimal Invasion
Principal Investigator & Team Members:
Prof. LI Zheng, Dr. Peter CHIU Ka Fung, Prof. Philip CHIU Wai Yan, Prof. NG Chi Fai, Mr. LUO Xiao (Department of Surgery), Dr. LEI Man Cheong (Multi-scale Medical Robotics Center) & Prof. LIU Yun-Hui (MAE Department)

5. Silver Medal: Modular, Foot-controlled, Cable-actuated Prosthetic
Principal Investigator & Team Members:
Prof. LAU Darwin Tat Ming, Mr. CHAN Sheung Yan & Miss Elizabeth CHAO Ting (MAE Department)

6. Silver Medal: Scalable Recycled Material-based Radiative Cooling for Free Cooling Harvesting
Principal Investigator & Team Members:
Prof. CHEN Chun, Mr. Ronaldo CHAN Hoi Fung, Miss XIAO Can (MAE Department) & Dr. YU Xinxian (The Jockey Club School of Public Health and Primary Care)

7. Silver Medal: Cable-driven Parallel Robot for Cleaning the Inclined Plates of Sedimentation Settlers
Principal Investigator & Team Members:
Prof. LAU Darwin Tat Ming, Mr. LEUNG Chun Ming (MAE Department) & Mr. Adrian LEUNG (Drainage Services Department of the Government of HKSAR)

8. Bronze Medal: Drone and AI-based Digital Platform for Outdoor Built Asset Inspection and Information Management
Principal Investigator & Team Members:
Prof. CHEN Xi, Prof. CHEN Ben M., Mr. YANG Guidong, Mr. ZHANG Jihan, Mr. ZHAO Benyun, Mr. GAO Chuanxiang & Mr. CHEUNG Ka Lung (MAE Department)

9. Bronze Medal: Autonomous Indoor Drone Inspection and Modelling System
Principal Investigator & Team Members:
Prof. CHEN Xi, Prof. CHEN Ben M., Mr. WANG Ruoyu, Mr. CHEN Yizhou, Mr. GUO Zixuan, Dr. Mark Kyeredey ANSAH & Mr. ZHAI Yu (MAE Department)

INTERNATIONAL EXHIBITION OF INVENTIONS OF GENEVA 2024

Gold Medal: Flexible Exoskeleton for Load Transportation
A versatile back exoskeleton with an intelligent actuation system to assist material handling work, enhancing personal welfare and industrial productivity.

Principal Investigator and Team Members:
Professor LIAO Wei-Hsin, Dr. CHAN Hugo Hung Tin, Dr. LIAO Hongpeng, Dr. GAO Fei & Mr. ZHAO Xuan

Gold Medal: MightySort: Intelligent Robotic Sorting Systems for MRFs
A waste-sorting robot system that replaces manual labour in recycling plants. It uses visual recognition and robots for efficient sorting and integrates seamlessly into existing processes.

Principal Investigator and Team Members:
Prof. CHEN Fei, Mr. DONG Zhipeng & Mr. WANG Shixiong

Silver Medal: MagicSort™: Intelligent Recycling System for Identification and Sorting of Municipal Recyclables
Principal Investigator and Team Members:
Prof. CHEN Fei, Mr. DONG Zhipeng & Mr. WANG Shixiong (Hong Kong Centre for Logistics Robotics Limited & SOTA Robotics (HK) Limited)

STAFF ACHIEVEMENTS

Aug 2021

CHINA'S EXCELLENT YOUNG SCIENTISTS FUND 2021

Prof. REN Wei has been awarded China's Excellent Young Scientists Fund 2021 for his project entitled "Laser diagnostics for flow fields". The Fund allows young who have demonstrated achievements in basic research to further conduct research in areas of their own choice, fostering intellectual development in academics.

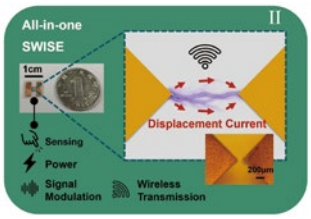
Sep 2021

XPLORER PRIZE 2021

Prof. LU Yi-Chun has been awarded the XPLORER PRIZE 2021. Being one of the three scholars from Hong Kong awarded the Prize, Prof. Lu is recognised for her outstanding achievement in the field of energy and environmental protection. Prof. Lu has successfully invented a safe, high-energy, low-cost, and environmentally-friendly battery that serves as a substitute for commercial lithium-ion batteries which are indispensable in daily lives. Her research provides a new platform for designing an aqueous electrolyte with a large voltage window and high stability for safe, low cost, and environmentally-friendly energy storage.

Sep 2021

ULTRA-THIN SELF-POWERED WIRELESS SENSING E-STICKER



A research team led by **Prof. ZI Yunlong** has developed a self-powered wireless sensing e-sticker (SWISE). SWISE can convert the energy of the finger touch on the e-sticker into electromagnetic wave signals for wireless transmission without batteries or wires. Taking advantage of flexible, ultra-thin, and long effective transmission distance, SWISE can further advance the development of smart sensing and remote-control technologies.

Dec 2021

HONG KONG ICT AWARDS 2021

The "CUHK Jockey Club AI for the Future Project" led by **Prof. YAM Yeung** has won the Gold Award in the Smart People (Smart Education and Learning) Category in the Hong Kong ICT Awards 2021. The Project's objective is to create a new AI curriculum and a sustainable AI education model, with relevant supporting infrastructure, to establish an ecosystem conductive to AI education for Hong Kong's secondary schools and to equip the next generation with AI knowledge and ethics. In 2021, the Project's curriculum team, together with six local pioneering schools, published the first-ever AI Teaching and Learning Pack for junior secondary students.

April 2022

SLIME ROBOT MAKES REMARKABLE TRIP THROUGH MODEL DIGESTIVE SYSTEM

The slime robot, developed by a research team led by **Prof. ZHANG Li**, can deform, grab objects and move, just like the sci-fi movie creatures. Indeed, the robot design was inspired by the movie Venom, but it is different from Venom in a way that it is expected to bring benefit to human beings in the future.

The magnet particles in the slime give it conductivity and the capability to change its shape to navigate through narrow tubes and complex mazes, self-heal and grab objects driven by an external magnetic field. The slime robot is expected to be of great value in medical applications, such as removing accidentally swallowed objects like button batteries and sharp bones.

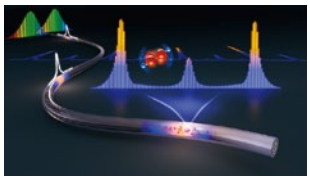
May 2022

NEW REDOX FLOW BATTERIES FOR EXTREME COLD WEATHER

A research team led by **Prof. LU Yi-Chun** has successfully developed a new electrolyte that enables high power, long life flow battery applications at both room temperature and low temperatures down to –20°C. The new flow battery achieves a high power density of 282.4 mW cm^{-2} and stability over 800 cycles (more than 1,200 hours) without decay at –20°C. This work enables high power, long life redox flow batteries to be used in regions with cold weather or severe weather fluctuations, a significant step towards the practical application of redox flow batteries for grid-scale storage of renewable energy.

May 2022

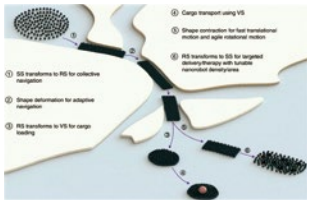
POTENTIAL FOR MULTI-GAS DETECTION IN JUST A SPLIT SECOND USING DUAL-COMB PHOTOTHERMAL SPECTROSCOPY



A research team led by **Prof. REN Wei** has demonstrated the world's first dual-comb photothermal spectroscopy (DC-PTS), a breakthrough in high-precision spectroscopy with proven potential for highly sensitive multi-gas detection from a small sample volume within a millisecond. It opens up a wider application in gas sensing, from the detection of toxic gases to the measurement of chemical compounds in breath samples, such as biochemical markers of COVID-19.

May 2022

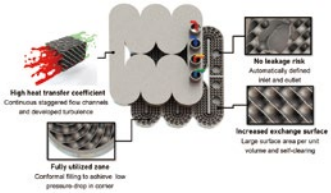
AI TECHNOLOGY NAVIGATES MICROROBOT SWARM IN COMPLEX ENVIRONMENTS INSIDE HUMAN BODY



Bees are extremely intelligent insects with the ability to communicate with the rest of their swarm to orchestrate their collective movement in complex environments. A research team led by **Prof. ZHANG Li** has built an artificial intelligence (AI) navigation system that can make millions of microrobots behave like a bee swarm, autonomously reconfiguring their motion and distribution according to environmental changes, such as going around obstacles inside a human body.

Jun 2022

RED DOT AWARD: DESIGN CONCEPT 2022



A research team led by **Prof. SONG Xu** received the Red Dot Award: Design Concept 2022, an internationally recognised seal for excellence in design innovation, for their work "Ultra-compact heat exchanger fabricated by 3D printing". The team developed an ultra-compact heat exchanger enabled by laser 3D printing technology. It employs the mathematically perfect Triply Periodic Minimal Surface (TPMS) structure in the heat exchanger design, which has the unique properties of high surface-area-to-volume ratio and smooth and intertwined fluid channels in 3D space.

Jul 2022

SMALL-SCALE "ORIGAMI" SOFT ROBOTS WITH INTEGRATED MULTIFUNCTIONAL MODULES

A research team led by **Prof. ZHANG Li** has devised a novel fabrication method for soft robots, using adhesive tape and magnetic microparticles with simple cutting and embedding. This structural fabrication, like 3D origami, provides a foundation for developing modular soft robots that potentially enable flexible shape deformation and multifunctionality in environmental sensing and medical tasks, after assembling different functional modules.

Jul 2022

OUTSTANDING CONTRIBUTION AWARD BY TCCT

Prof. CHEN Ben M. has received the Outstanding Contribution Award presented by the Technical Committee on Control Theory (TCCT), Chinese Association of Automation. The recipients of Outstanding Contribution Award are the individuals who have served TCCT for a considerably long time and have made significant contributions to enhance the development of control theory and its applications in China.

Aug 2022

RGC RESEARCH FELLOW

Prof. LU Yi-Chun has been awarded the title of "RGC Research Fellow" under the 2022-23 Research Grants Council (RGC) Research Fellow Scheme in recognition of her distinguished research achievements. The research project of Prof. Lu is "Polysulfide-based aqueous redox flow batteries with high stability and high-power density for low-cost and long-duration energy storage".

Aug 2022

BRONZE AWARD IN THE TERA-AWARD SMART ENERGY INNOVATION COMPETITION

Luquos Energy, a start-up led by **Prof. LU Yi-Chun**, won the Bronze Award in the TERA-Award Smart Energy Innovation Competition organised by the Hong Kong and China Gas Company Limited (Towngas) and State Power Investment Corporation. Out of 208 projects from 23 countries and regions, Luquos Energy's "Safe and Low-cost Flow Battery" won third place, receiving the Bronze Award and US$50,000. Luquos Energy has received strategic investment of tens of millions of Hong Kong dollars from Towngas.

Oct 2022

NSFC YOUNG SCIENTISTS FUND 2022

Prof. MA Xin has received the National Natural Science Foundation of China's (NSFC) Young Scientists Fund 2022 for his project "Design, optimisation and human-machine cooperation control of multilayer, multi-form, rigid-flexible, hybrid structure". The Fund started accepting applications from Hong Kong researchers in 2022. It supports young scholars as they carry out basic research in areas of their choice, enhancing their ability to conduct innovative projects independently and fostering the promotion of young scientists.

Oct 2022

NOVEL MAGNETIC HELICAL MICROROBOT WITH ENDOSCOPE-ASSISTED DELIVERY FOR BIOFILM ERADICATION IN EAR TUBES

Prof. ZHANG Li and members from the Department of Otorhinolaryngology, Head and Neck Surgery at CU Medicine joined hands to develop a magnetic helical microrobot with endoscope-assisted delivery for biofilm eradication in ear tube. The treatment system consists of helical microrobot, endoscope, magnetic actuation unit with robotic arm, and catheter. Surgeons first use an endoscope to deliver the helical microrobot with a catheter into the ear tube. Then they can remotely actuate the microrobot by the programmed magnetic field in the ear tube to perform biofilm eradication.

Oct 2022

CHINA TOP CITED PAPER AWARD FROM IOP PUBLISHING

Prof. LIAO Wei-Hsin has received the China Top Cited Paper Award by IOP Publishing for his research paper that is among the most influential articles from China. IOP Publishing selected the papers from across the entire IOP Publishing journal portfolio within the past three years (2019-21), recognising the top 1% of most cited papers in different areas. The award-winning paper, *4D printed tunable mechanical metamaterials with shape memory operations*, was published in *Smart Materials and Structures* in 2019, and won in the materials category. It introduced tunable metamaterials with reversible thermo-mechanical memory operations developed using fused decomposition modelling (FDM).

Nov 2022

CABLE-DRIVEN ROBOT FOR HIGH-RISE BUILDING FACADES

With Hong Kong's construction industry plagued by manpower shortages over the past few years, safety has never been more important. As a first, a research team led by **Prof. LAU Darwin Tat Ming** has developed a cable-driven robot which accurately mimics human movement to clean building windows and paint facades. The system is expected to replace human wiper and roller-based window cleaning and facade painting works at high-rise buildings, helping to relieve the industry's labour shortages and reduce safety risks, and reducing occupational hazards.

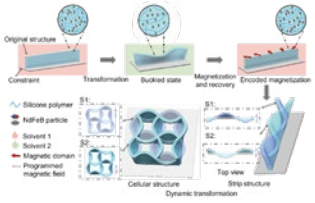
Dec 2022

CIC CONSTRUCTION INNOVATION AWARD 2022

Prof. LAU Darwin Tat Ming and his team have won the Young Innovator Prize in the CIC Construction Innovation Award 2022 for the project "Mobile cable-driven robot system for contact-based façade inspection". The project presents a cable-driven robot system to perform physical contact-based façade inspections. The cable-driven robot system aims to be easy to deploy, safe to operate, capable of inspecting large façade surfaces, and able to perform a wide range of non-contact and physical contact inspection tasks. The robotic system can autonomously conduct façade inspections of high-rising buildings, circumventing the need for working at height and minimizing workers' risks.

Dec 2022

3D SOFT ARCHITECTED MATERIALS WITH MAGNETIC CONTROL DYNAMIC MORPHOLOGICAL TRANSFORMATION



A collaborative research team led by **Prof. ZHANG Li** has developed a ferromagnetic silicone elastomer with three-dimensional (3D) deformability, further expanding new applications of morphable soft materials in various engineering fields, such as shaping more flexible soft robots. The research results have been published in the internationally renowned journal *Nature Communications*.

Dec 2022

TOP 10 INNOVATION AND TECHNOLOGY NEWS IN HONG KONG IN 2022

The research of **Prof. ZHANG Li** on magnetic slime robot has been selected as Top 10 Innovation and Technology News in Hong Kong in 2022. The online voting of the "Top 10 Innovation and Technology News" was organized by the Beijing-Hong Kong Academic Exchange Centre.

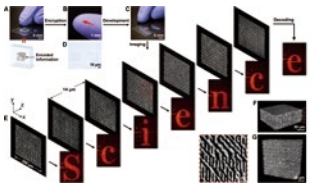
Jan 2023

IEEE FELLOW 2023

Prof. ZHANG Li has been elected Fellow of the prestigious Institute of Electrical and Electronics Engineers (IEEE) in the class of 2023 for his contributions to micro-/nanorobot swarms and platforms for translational biomedicine.

Jan 2023

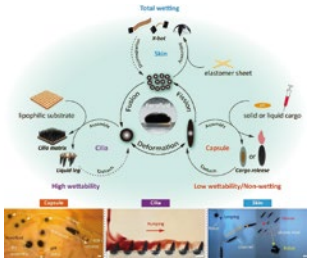
BREAKTHROUGH TECHNIQUES TAKING NANOSCALE 3D PRINTING INTO A NEW ERA



Multi-material 3D fabrication at nanoscale has been the holy grail of nanotechnology and a key enabler for the development of new technologies, including photonic, electronic, and biomedical devices. **Prof. CHEN Shih-Chi** and his team, in collaboration with Prof. ZHAO Yongxin from Carnegie Mellon University and Prof. ZHAO Ni from CUHK's Department of Electronic Engineering, have developed a 3D nanofabrication platform that for the first time realises multi-material fabrication, meaning it is able to make a great variety of materials, including metals, alloys, semiconductors, polymers, ceramics and biomaterials at a record-setting resolution of 20 nanometers, and a light patterning speed of 300 mm^3/hour, three orders of magnitude faster than conventional serial fabrication systems that are currently used in the commercial world. The achievement has recently been published in the journal *Science*, affirming its status as a technological breakthrough that leads nanoscale 3D printing into a new era.

Jan 2023

DIVERSIFIED MINIATURE SOFT MACHINES WITH FERROFLUIDS BASED ON THEIR THREE WETTING CHARACTERISTICS



Prof. ZHANG Li has developed multifunctional miniature machines using the three wetting characteristics of ferrofluids, which not only have more robust deformation capabilities but can also exhibit a variety of motion modes, further expanding the prospects for applications of miniature soft machines in biomedicine. Study results have been published in the international journal *Nature Communications* and featured on its Editors' Highlights website "Applied physics and mathematics".

Feb 2023

INNOVATIVE APPROACH ENABLES STUDENTS TO CONTINUE REAL-TIME EXPERIMENT REMOTELY

After three years of battling the COVID-19 pandemic, online learning has become more and more popular, promoting the development of innovative educational approaches. **Dr. HAN Dongkun** and his team designed and assembled 12 robotic arms from scratch to form the "Flipped online laboratory", a new pedagogical approach to eLearning that allows students to use cross-platform remote control technology to operate robotic arms and laboratory instruments on campus in real time.

Mar 2023

WIRELESSLY POWERED ELECTRONIC STENTS FOR GASTRIC ACID REFLUX TREATMENT: A NEW NON-INVASIVE THERAPY

A collaborative research team led by **Prof. ZHANG Li**, and Prof. Philip CHIU Wai Yan and Prof. Tony CHAN Kai Fung from the CU Medicine has developed wirelessly powered electronic stents for a new electrical stimulation therapy to prevent and potentially cure gastric acid reflux. This collaborative work was published recently in the renowned international research journal *Science Advances*.

May 2023

INVENTION OF AN AERIAL-AQUATIC HYBRID DRONE

A research team jointly led by **Prof. CHEN Ben M.** and Prof. CHEN Jie from Tongji University's Shanghai Research Institute for Intelligent Autonomous Systems has successfully invented the TJ-FlyingFish, an unprecedented amphibious drone capable of exploring underwater environments. Launched in early February 2023, this remarkable creation is a game-changing tool for a wide range of industries.

The TJ-FlyingFish is completely autonomous, requiring no human intervention during its journey. When in flight, all four units face upwards and spin at high speed. Once the drone lands on water, the units rotate to face downwards and spin at a lower speed, pulling the drone beneath the surface. It is equipped with a cross-domain positioning and navigation system, consisting of GPS, an inertial measurement unit, a depth meter and a mini doppler velocity log, which enables autonomous control during its entire amphibious journey. The drone can be used for aerial and aquatic surveys, remote sensing and search-and-rescue operations, among other applications.

May 2023

AN INTERVENTIONAL CATHETERISATION-INTEGRATED SWARMING MICROROBOTIC PLATFORM FOR ANEURYSM EMBOLISATION TREATMENT: A NEW NON-INVASIVE APPROACH

A collaborative research team led by **Prof. ZHANG Li** and Prof. Simon YU Chun Ho from CU Medicine has developed swarming self-adhesive microgels for a new embolisation strategy to prevent aneurysms from continuously bulging to a point of rupture. This collaborative work was published recently in the renowned international research journal *Science Advances*.

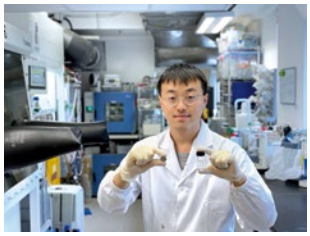
Jun 2023

LEADER OF THE YEAR 2022

Prof. LIU Yun-Hui was awarded the Leader of the Year 2022 in the Education/Professions/Technology & Innovation category by Sing Tao News Corporation Limited for his significant contributions to Hong Kong. The annual event "Leader of the Year" has been established by Sing Tao News Corporation Limited since 1994 with the aim of recognizing and encouraging the achievements of Hong Kong's finest individuals who have made outstanding contributions towards Hong Kong's success and prosperity, linking it to mainland China and the international community.

Jul 2023

ADDING EDIBLE SALT TO THE ELECTROLYTE RECIPE TO CREATE SAFE, LONG-LIFE AQUEOUS ZINC BATTERIES



A research team led by **Prof. LU Yi-Chun** has taken a critical step forward in creating a high-performance, eco-friendly electrolyte for aqueous zinc batteries. The team applied a strategy from pharmaceutical science to increase drug solubility, solving the problems of aqueous zinc batteries' short life span by enabling highly concentrated zinc acetate electrolytes, a halogen-free zinc salt. The breakthrough was recently published in the world-leading scientific journal *Nature Sustainability*, a sister journal of Nature.

Aug 2023

WINNER FOR THE FALLING WALLS SCIENCE BREAKTHROUGHS OF THE YEAR 2023

Prof. CHEN Shih-Chi has been selected as a winner for the Falling Walls Science Breakthroughs of the Year 2023 in the category of Engineering and Technology. Prof. Chen is recognized for his development of a revolutionary nanoscale 3D printing platform based on femtosecond projection that achieved a record-setting resolution of 20 nm, a printing rate of 400mm^3/hour, and a lower cost at US$1.5/$mm^3$. It supports nanofabrication with 20 different materials, addressing critical fabrication challenges in nanotechnology, photonics, energy, and biotechnology.

Sep 2023

MAGNETIC HYDROGEL MICROMACHINES WITH ON-DEMAND REACTIVE OXYGEN SPECIES RELEASE FOR ANTI-BIOFILM TREATMENT

A collaborative research team led by **Prof. ZHANG Li** achieved a breakthrough in magnetic microrobots. The team has developed magnetic hydrogel micromachines that can combat biofilm within small tubular medical implants. Featuring new on-demand reactive oxygen species releasing technology, the micromachines open up the possibility of applying the treatment to a broader range of body parts, especially hard-to-reach regions deep inside the body. The findings have been published in the scientific journal *Advanced Intelligent Systems* and highlighted in *Advanced Science News*.

Sep 2023

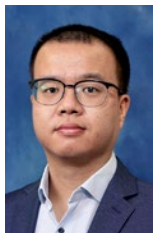
LEONARDO DA VINCI AWARD 2023

Prof. LIAO Wei-Hsin recently won the 2023 Leonardo Da Vinci Award from the Design Engineering Division of the American Society of Mechanical Engineers (ASME). Prof. Liao is the first scholar from Hong Kong to win the ASME Leonardo Da Vinci Award in its 45-year history.

The ASME commended Prof. Liao for his outstanding contributions to the design and invention of machines and devices for human motion assistance, with applications in prostheses, exoskeletons and wearables such as smartwatches and wristbands.

Sep 2023

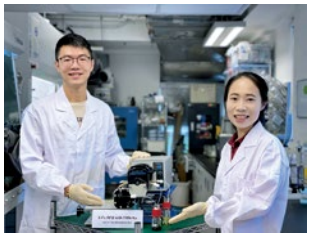
NSFC YOUNG SCIENTISTS FUND 2023



Prof. CHEN Yue and **Prof. WANG Zhen** have received the NSFC's Young Scientists Fund 2023. Each of them will receive funding of RMB300,000 to support their projects for three years. Prof. Chen's project is "Real-time aggregation and operation methods for distributed energy resources based on an energy sharing mechanism" and Prof. Wang's project is "Highly sensitive gas sensing based on mid-infrared doubly resonant photoacoustic spectroscopy".

Dec 2023

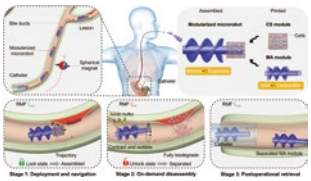
ENERGY-EFFICIENT REDOX FLOW BATTERY WITH BIOMIMETIC MOLECULAR CATALYSTS



A research team led by **Prof. LU Yi-Chun** has successfully developed a biomimetic molecular catalyst to enable a low-cost, energy-efficient, sulphur-based redox flow battery via homogeneous catalysis, successfully tackling the bottleneck of the poor kinetics of sulphur-based redox flow batteries. A report on the breakthrough was recently the cover story of world-leading scientific journal *Nature Energy*'s December issue.

Jan 2024

NEW MODULAR MAGNETIC MICROROBOT TO DELIVER CELLS INTO THE BILE DUCT FOR TARGETED THERAPY



A collaborative research team led by **Prof. ZHANG Li**, and Prof. Philip CHIU Wai Yan and Prof. Tony CHAN Kai Fung from CU Medicine, with Prof. Joseph SUNG Jao-Yiu from Nanyang Technological University, who is also an emeritus professor at CU Medicine, has developed a modular microrobot with lockable and detachable modules, which provides a powerful propulsive force for targeted cell delivery in the bile duct without leaving any non-degradable materials inside it. This collaborative work was published recently in the renowned international research journal *Science Advances*.

Mar 2024

HONG KONG ENGINEERING SCIENCE AND TECHNOLOGY AWARD 2023

Prof. LU Yi-Chun has been awarded the Hong Kong Engineering Science and Technology Award 2023 by the Hong Kong Academy of Engineering Sciences for her accomplishments and contributions in materials science, engineering and energy engineering, particularly sustainable battery technology. Prof. Lu was honoured by the recognition and stated that she and her team will continue to advance energy storage technology for a future of safe, sustainable energy.

Apr 2024

NOVEL RETRIEVABLE NANOROBOTS FOR TARGETED AND ENHANCED THROMBOLYSIS

A cross-disciplinary research team, including **Prof. ZHANG Li**, has developed magnetic tissue plasminogen activator (tPA)-anchored nanorobots (tPA-nbots) to treat ischemic stroke. The novel technology exhibits a thrombolysis rate 5 to 20 times faster than traditional treatment and capabilities in recanalising more distal and smaller branches. It demonstrates potential to benefit patients by reducing brain damage and minimising side effects. The team also succeeded in using laser speckle contrast imaging (LSCI) guidance for real-time tracking and delivery of nanorobots and instant monitoring the bloodstream, providing a novel approach for nanorobots-based endovascular intervention therapy.

Apr 2024

CHINA'S TOP 10 OPTICAL BREAKTHROUGHS (FUNDAMENTAL RESEARCH)

Prof. CHEN Shih-Chi and his team have received the 2023 Award for China's Top 10 Optical Breakthroughs (Fundamental Research) for their research entitled "Three-dimensional nanofabrication via ultrafast laser patterning and kinetically regulated material assembly". The Chinese Laser Press has established this Award since 2005 with the aims of disseminating innovative and important achievements by Chinese researchers and further boosting the development of optics in China. It is one of the top awards in optics in China.

STUDENT ACHIEVEMENTS

Nov 2021

2021 CHINA UNIVERSITY STUDENTS ENGINEERING PRACTICE AND INNOVATION ABILITY COMPETITION

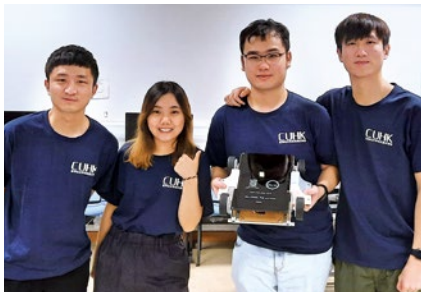
Miss WANG Xingyu (UG, MAEG), Miss KWOK Tien Wing (UG, MAEG), Mr. WANG Wenhao (UG, MAEG) and Mr. CHEN Yiwei (UG, EEEN) received the Silver Award in the Intelligent Logistics Handling of the "Smart +" Category in the national finals of the 2021 China University Students Engineering Practice and Innovation Ability Competition.

READ MORE

Apr 2022

THE 10TH GREATER CHINA DESIGN COMPETITION

Mr. CHOW Tsun Yu (UG, MAEG), Mr. CHEUNG Cheuk Yuen (UG, MAEG), Mr. TSE Siu Hung Henry (UG, MAEG) and Miss FONG Ching Man (UG, EEEN) received the First Runner-up in the 10th Greater China Region Design Competition 2022. The team designed and built a "self-balancing robot" that could be used for balancing an object at different slopes.



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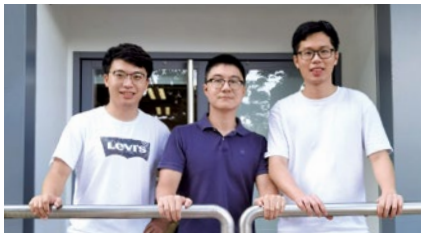
May 2022

TOP PRIZE AT THE 17TH "CHALLENGE CUP" NATIONAL COLLEGE STUDENTS' EXTRACURRICULAR ACADEMIC SCIENCE AND TECHNOLOGY CONTEST

The CUHK team, comprising Mr. WANG Yan, Mr. LIN Hongbin, and Mr. WANG Xuchen, Ph.D. students of Prof. AU Kwok Wai Samuel, performed outstandingly to win the Top Prize for the first time at the 17th "Challenge Cup" National College Students' Extracurricular Academic Science and Technology Contest.

TOP PRIZE: MINIATURISED ROBOTIC STEERABLE SURGICAL DRILL FOR CONFINED-SPACE BONE WORK

The team developed a miniaturised steerable surgical drill for bone work in a confined space. The miniature size of the tip at 4.5 mm in diameter and the large distal bending angle of 65° allow it to reach target surgical sites through small incisions while steering around anatomical corners. That reduces intraoperative damage to patients, shortens hospitalisation and recovery times, and lowers the risk of complications.



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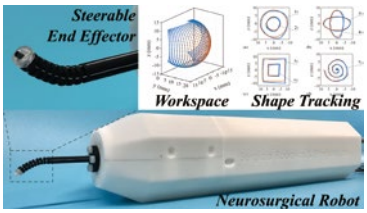
May 2022

THE 8TH HONG KONG UNIVERSITY STUDENT INNOVATION AND ENTREPRENEURSHIP COMPETITION

READ MORE

MAE student teams have received 11 prizes, namely four Second Prizes, three Third Prizes and four Merit Prizes, at the 8th Hong Kong University Student Innovation and Entrepreneurship Competition.

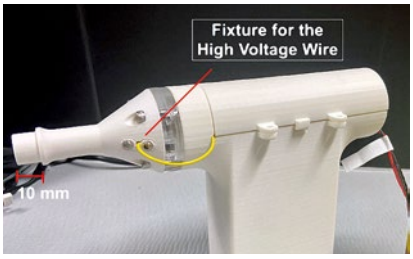
Prize	Awardee	Project Name
Category: Innovation - Information Technology		
Merit	Mr. LIU Kangcheng (Ph.D., MAE) Prof. CHEN Benmei (Supervisor)	Autonomous Robots Based Intelligent Defects Detection for Local Infrastructures Inspections
Category: Innovation - Mathematics and Physics / Mechanics and Control Systems		
Second	Mr. DING Qingpeng (Ph.D., MAE) Prof. CHENG Shing Shin (Supervisor)	A SMA-Driven MRI Compatible Neurosurgical Robot  READ MORE
Second	Mr. LEE King Hang Henry (UG, MAEG) Mr. YIU Chi Ho (UG, CSE) Prof. LAU Darwin Tat Ming (Supervisor) Prof. LEE Ho Man Jimmy (Supervisor, CSE)	Automatic Strawberry Pollination Robot for Indoor Horticulture  READ MORE
Third	Mr. YAN Junyan (Ph.D., MAE) Mr. CHEN Jibiao (Ph.D., MAE) Mr. XUE Jiaqi (Research Staff, MAE) Mr. FANG Haiyang (Ph.D., MAE) Mr. YUAN Sishen (Ph.D., EE) Mr. QIU Yufu (MSc, MAE) Prof. CHENG Shing Shin (Supervisor)	A Robotic Cannula for Minimally Invasive Intracerebral Hemorrhage Evacuation
Category: Innovation - Mathematics and Physics / Mechanics and Control Systems		
Third	Mr. YUAN Sishen (Ph.D., EE) Mr. XUE Junnan (MSc, ME, HIT(SZ)) Mr. YUE Wenchao (Ph.D., EE) Mr. CHEN Zixuan (UG, EE) Mr. YAN Junyan (Ph.D., MAE) Mr. FANG Haiyang (Ph.D., MAE)	Integrated Magnetic Control of Anchoring and Drug Release for Wireless Capsule Robots
Third	Mr. WANG Xuchen (Ph.D., MAE) Mr. YAN Junyan (Ph.D., MAE) Mr. NG Wee Shen (M.Phil., MAE) Mr. XUE Jiaqi (Research Staff, MAE) Prof. AU Kwok Wai Samuel (Supervisor)	Handheld Flexible Robotic Surgical Endoscope for Confined ENT Space
Merit	Mr. NG Pui Hin (UG, MAEG) Prof. AU Kwok Wai Samuel (Supervisor)	Cubli
Category: Innovation - Life Sciences		
Merit	Miss NG Hui Yin (UG, MAEG) Mr. YIM Ming Yeung Arthur (UG, MAEG) Mr. LI Fengsen (UG, MAEG) Mr. LEUNG Hing Chun (UG, MAEG) Prof. WONG Hay (Co-Supervisor) Prof. CHEN Chun (Co-supervisor)	Surface and Air Disinfection with Atmospheric Non-Thermal Plasma

Prize	Awardee	Project Name
Category: Entrepreneurship - Startup		
Second	Dr. FU Xinlei (Ph.D. Graduate, MAE) Dr. ZHONG Qiuyuan (Research Staff, MAE) Dr. XU Xiayi (Research Staff, MAE) Prof. CHEN Shih Chi	A Novel Tissue Sectioning System for 3D Imaging and Drug Screening
Second	Mr. LI Chun Fung (Research Staff, MAE) Mr. LEUNG Chun Ming (Ph.D., MAE) Mr. CHAN Hing Cheung (M.Phil., MAE) Prof. LAU Darwin Tat Ming (Supervisor)	Cable-driven Robot System for Inspection of High-rise Building Façade
Category: Social Enterprise / Cultural & Creative Services		
Merit	Mr. CHAN Tak Keung (MSc, MAE)	TheBiscuit

Jun 2022

OUTSTANDING AWARD IN ASM TECHNOLOGY AWARD 2022

Miss NG Hui Yin, Mr. LEUNG Hing Chun, Mr. LI Fengsen and Mr. YIM Ming Yeung Arthur from MAEG programme received the Outstanding Award in ASM Technology Award 2022 for their project "Surface and air disinfection with atmospheric non-thermal plasma".



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Jun 2022

VTECH INNOVATION AND SUSTAINABILITY AWARD 2021/22

The VTech Innovation and Sustainability Award is the initiative of VTech Group of Companies (VTech) to promote innovation and awareness of sustainability. The Award is open to final-year undergraduate students studying Energy and Environmental Engineering (EEEN) or Mechanical and Automation Engineering (MAEG). With a generous donation from VTech, the Award recognizes and rewards students for their final year projects which demonstrate excellence in developing innovative technology to improve sustainability of human life.

Award	Awardee	Project Title
Champion	Miss NG Hui Yin (MAEG) (Supervisor: Prof. WONG Hay)	Development of a Surface Disinfection Gun
1st Runner-up	Mr. HO Ka Chun (EEEN) (Supervisor: Prof. XU Yunjian)	A Hardware-in-the-Loop Simulation Platform for Smart Electric Vehicle Charging Stations
2nd Runner-up	Mr. HON Wing Ngai (EEEN) (Supervisor: Dr. HAN Dongkun)	E-Platform Construction for Recycling Facilities in CUHK Smart Garden
Honorable Mentions	Miss CHU Wai Ying (EEEN) (Supervisor: Dr. HAN Dongkun)	Renewable Energy Harvesting with its Influence on Smart Grid Systems
	Mr. YIM Ming Yeung Arthur (MAEG) (Supervisor: Prof. WONG Hay)	Development of a Cost-Effective, mini Localized Air Disinfection System

READ MORE

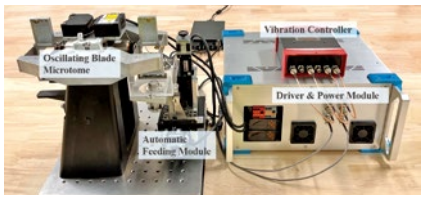
Nov 2022

THE 8TH CHINA INTERNATIONAL COLLEGE STUDENTS' 'INTERNET+' INNOVATION AND ENTREPRENEURSHIP COMPETITION

Dr. FU Xinlei (Ph.D. Graduate, MAE), Dr. ZHONG Qiuyuan (Research Staff, MAE) and Dr. XU Xiayi (Research Staff, MAE), under supervision of Prof. CHEN Shih-Chi, received Silver Medal at the 8th China International College Students' 'Internet+' Innovation and Entrepreneurship Competition for their project entitled "A novel tissue sectioning system for 3d imaging and drug screening".

PROJECT DESCRIPTION:

Precision Cut Limited is founded by a team of experts in precision engineering and biomedical engineering from CUHK. The team is dedicated to developing solutions of precision tissue sectioning and cutting via various technologies. The proposed product is the ultrafast oscillating blade microtome for precision tissue sectioning. The new microtome successfully addresses the existing challenges for the commercial products. The highest blade oscillating frequency (up to 350 Hz) and minimal error motion (< 1 μm) ensure excellent cutting capability, which will generate great commercial value in the fields of pathology and biophotonics.



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Mar 2023

THE 3RD GUANGDONG-HONG KONG-MACAO UNDERGRADUATE ENGINEERING PRACTICE AND INNOVATION ABILITY COMPETITION

Two student teams, comprising undergraduate students Miss LAM Yan Tung (MAEG), Miss CHIANG Hiu Ying (MAEG), Miss YAN Jiayin (MAEG), Miss TSANG Kit Yi (EEEN) and Miss YUNG Choi Yam (EEEN), received the Second Prizes in the 3rd Guangdong-Hong Kong-Macao Undergraduate Engineering Practice and Innovation Ability Competition, hosted by the Department of Education of Guangdong Province.

The teams participated in the "Smart +" Category: Intelligent Logistics Handling in which they designed an autonomous robot that could complete specific tasks such as QR code scanning, materials delivery, etc. within a limited time.

READ MORE

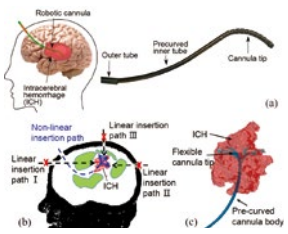
Apr 2023

GOLD PRIZE AT THE 13TH CHALLENGE CUP CHINA COLLEGE STUDENTS' ENTREPRENEURSHIP COMPETITION

Mr. CHEN Jibiao and Mr. YAN Junyan, Ph.D. students of Prof. CHENG Shing Shin, received the Gold Prize in the "science and technology innovation and future industry" category at the 13th Challenge Cup China College Students' Entrepreneurship Competition.

THE GOLD PRIZE PROJECT: A ROBOTIC CANNULA FOR MINIMALLY INVASIVE INTRACEREBRAL HEMORRHAGE EVACUATION

Neurosurgery involves high-risk, highly complex operations that require great precision. The team, under the guidance of Prof. Cheng, invented a new type of continuum robotic cannula for neurosurgery with a motion planning and navigation system. It consists of a straight or precurved rigid body and a flexible tip. The navigation system can reconstruct the brain map of the patient before operations, carry out preoperative and intraoperative motion planning and control, and customise the optimal cannula design based on the patient's anatomy, enabling the cannula to be accurately positioned while minimising damage to normal brain tissue and improving the evacuation completeness of intracerebral hemorrhage.



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Jun 2023

PROFESSOR CHARLES K. KAO STUDENT CREATIVITY AWARDS 2023

MAE students received 9 awards (out of 15 awards) in Professor Charles K. Kao Student Creativity Awards 2023 organized by The Office of Research and Knowledge Transfer Services and Center for Entrepreneurship at The Chinese University of Hong Kong.

Award	Project Name	Awardee
2nd Runner-up (Undergraduate Group)	Portable Non-Thermal Plasma and UVC Negative Pressure System for Home Isolation (and Pending Admission)	Mr. KONG Ming Hang (UG, MAEG) Mr. WONG Chak Shing (UG, MAEG) Miss LI Wai Laam (UG, EEEN) (Supervisor: Prof. WONG Hay)
Champion (Postgraduate Individual)	An Encrypted 3D Optical Storage based on Projection of Ultrafast Lasers	Mr. GU Songyun (Ph.D., MAE) (Supervisor: Prof. CHEN Shih-Chi)
1st Runner-up (Postgraduate Individual)	Telescopic Aerodynamic Appendage: Enabling Legged Robots with Aerial Adjustment and Robust Landing Capabilities for Applications in Confined and Hazardous Environments	Mr. FAN Chun Yin (M.Phil., MAE) Mr. WONG Fei Yan Fiat (M.Phil., MAE) (Supervisor: Prof. AU Kwok Wai Samuel)
Merit (Postgraduate Individual)	A Multi-imager Compatible Surgical Robot Driven by Modular SMA with Real-time Performance	Mr. DING Qingpeng (Ph.D., MAE) (Supervisor: Prof. CHENG Shing Shin)
Champion (Postgraduate Group)	Drone and AI Based Digital Platform for Outdoor Built Asset Inspection and Information Management 	Mr. ZHANG Jihan (Ph.D., MAE) Mr. ZHAO Benyun (Ph.D., MAE) Mr. YANG Guidong (Ph.D., MAE) Mr. CHEUNG Ka Lung (Ph.D., MAE) Miss DOU Jia (M.Phil., MAE) Miss HAN Bingxin (Ph.D., MAE) (Supervisors: Prof. CHEN Ben M. & Prof. CHEN Xi)
Champion (Postgraduate Group)	Scalable Recycled Material-based Radiative Cooling for Free Cooling Harvesting 	Miss XIAO Can (Ph.D., MAE) Mr. CHAN Hoi Fung Ronaldo (UG, EEEN) Mr. ZHANG Juyuan (UG, CSE) (Supervisor: Prof. CHEN Chun)
2nd Runner-up (Postgraduate Group)	UAV-based System for Civil Infrastructure Inspection and Reconstruction	Mr. GAO Chuanxiang (Ph.D., MAE) Mr. WANG Ruoyu (Ph.D., MAE) Miss WANG Xinyi (Ph.D., MAE) Mr. CHEN Yizhou (Ph.D., MAE) Mr. ZHAO Zuoquan (Ph.D., MAE) Mr. DING Wendi (Ph.D., MAE) (Supervisors: Prof. CHEN Ben M. & Prof. CHEN Xi)
2nd Runner-up (Postgraduate Group)	Hand-Held Hybrid-Structure Robotic Surgical System for Confined Space ENT Surgery	Mr. WANG Xuchen (Ph.D., MAE) Mr. NG Wee Shen (M.Phil., MAE) Mr. LIN Hongbin (Ph.D., MAE) (Supervisors: Prof. AU Kwok Wai Samuel & Prof. MA Xin)
Special Award (Mathematics and Physics /Mechanics and Control Systems)	Telescopic Aerodynamic Appendage: Enabling Legged Robots with Aerial Adjustment and Robust Landing Capabilities for Applications in Confined and Hazardous Environments	Mr. FAN Chun Yin (M.Phil., MAE) Mr. WONG Fei Yan Fiat (M.Phil., MAE) (Supervisor: Prof. AU Kwok Wai Samuel)

Jun 2023

THE 9TH HONG KONG UNIVERSITY STUDENT INNOVATION AND ENTREPRENEURSHIP COMPETITION

MAE student teams received 6 prizes, namely one Grand Prize, one First Prize, two Second Prizes and two Merit Prizes, at the 9th Hong Kong University Student Innovation and Entrepreneurship Competition.

1. **Grand Prize (Innovation):**
   A MR Safe RCM Constrained Robotic Needle with Bellow-based Hydraulic Actuators for Spine Procedures
   Mr. QIU Yufu (Ph.D., MAE), Mr. YAN Junyan (Ph.D., MAE), Mr. CHEN Jibiao (Ph.D., MAE), Mr. FANG Haiyang (Ph.D., MAE), Prof. CHENG Shing Shin (Supervisor)
2. **First Prize (Mathematics and Physics / Mechanics and Control Systems):**
   A MR Safe RCM Constrained Robotic Needle with Bellow-based Hydraulic Actuators for Spine Procedures
   Mr. QIU Yufu (Ph.D., MAE), Mr. YAN Junyan (Ph.D., MAE), Mr. CHEN Jibiao (Ph.D., MAE), Mr. FANG Haiyang (Ph.D., MAE), Prof. CHENG Shing Shin (Supervisor)
3. **Second Prize (Mathematics and Physics / Mechanics and Control Systems):**
   A Semi-autonomous Handheld Robotic System with Ultrasound-based Visual Feedback and Shared Control for Pericardiocentesis
   Mr. YAN Wanquan (PhD., MAE), Mr. YAN Kim (M.Phil., MAE Alumnus), Prof. CHENG Shing Shin (Supervisor)
4. **Second Prize (Mathematics and Physics / Mechanics and Control Systems):**
   Handheld Hybrid Structure Robotic Surgical System for Confined Space ENT Surgery
   Mr. WANG Xuchen (Ph.D., MAE), Mr. NG Wee Shen (M.Phil., MAE), Mr. LIN Hongbin (Ph.D., MAE), Prof. AU Kwok Wai Samuel (Supervisor)
5. **Merit Prize (Mathematics and Physics / Mechanics and Control Systems):**
   A Flexible and Energy-efficient Wearable Back-support Exoskeleton for Asymmetric Lifting Tasks Assistance
   Mr. LIAO Hongpeng (Ph.D., MAE), Mr. CHAN Hugo Hung Tin (Ph.D., MAE), Prof. LIAO Wei-Hsin (Supervisor)
6. **Merit Prize (Startup):**
   Femtosecond Projection NanoPrinter Ultrafast Multimaterial 3D Nanofabrication Platform
   Mr. DATAR Charudatta Achyut (Ph.D., MAE), Dr. ZHONG Qiuyuan (Staff, MAE), Mr. GU Songyun (Ph.D., MAE), Dr. HAN Fei (Staff, MAE), Dr. FU Xinlei (Ph.D., MAE Alumnus), Prof. CHEN Shih-Chi (Supervisor)

INNOVATION GRAND PRIZE AND FIRST PRIZE: A MR SAFE RCM CONSTRAINED ROBOTIC NEEDLE WITH BELLOW-BASED HYDRAULIC ACTUATORS FOR SPINE PROCEDURES

Metal and electrical materials affect the Magnetic Resonance Imaging (MRI) process, which makes conventional robotic systems unusable. The MAE student team has countered that with the MRI-safe robotic system using a bellows-based hydraulic actuator that they have developed, which does not contain any metal or electronic components in the MRI chamber. The system has a 2-DOF (two-degree-of-freedom) RCM (remote centre-of-motion) mechanism and a 1-DOF needle insertion device, which can be fixed on the patient's back and placed in the MRI scanner to perform various percutaneous interventional spine procedures with real-time image guidance. Equipment outside the MRI chamber drives the robot, providing pressure that expands and contracts the bellows.

READ MORE

Jun 2023

VTECH INNOVATION AND SUSTAINABILITY AWARD 2022/23

The following five students were awarded the VTech Innovation and Sustainability Award 2022/23 for their outstanding final year projects with elements of "Innovation" and "Sustainability".

Award	Awardee	Project Title
Champion	Mr. CHEUNG King Ho (EEEN) (Supervisor: Dr. HAN Dongkun)	E-platform Construction for the Aquaponics System in CUHK Smart Garden
1st Runner-up	Mr. CHEN Zhenxi (EEEN) (Supervisor: Dr. HAN Dongkun)	E-platform Construction for the Aquaponics System in CUHK Smart Garden
2nd Runner-up	Miss LEE Man Lai (EEEN) (Supervisor: Prof. ZHANG Weizhao)	Experiments and Modeling on the Reversibility of CFRPs subjected to Artificial Seawater Immersion
Honorable Mentions	Miss BHATTACHARJYA Eshanee (EEEN) (Supervisor: Prof. CHEN Yue)	Determining Real-Time Electricity Price in a Wholesale Electricity Market Integrated with Energy Storage Systems
	Miss KOO Kin Yee (EEEN) (Supervisor: Prof. CHEN Xi)	Estimating the Impact of Microclimate on Building Energy Performances in High-Density Urban Contexts

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Jul 2023

GUAN ZHAO-ZHI AWARD AT THE 42ND CHINESE CONTROL CONFERENCE

Mr. DOU Minghao (Ph.D., MAE), Mr. LIU Xuchen (Ph.D., MAE), Mr. HUANG Dongyue (Ph.D., MAE) and Prof. CHEN Ben M. won the Guan Zhao-Zhi Award at the 42nd Chinese Control Conference for their project "Modeling and operating point analysis for aquatic translational motion of a cross-medium vehicle".

Established in 1994, the Guan Zhao-Zhi Award aims to memorize and honor Professor Guan Zhao-Zhi and to promote the development of control theory in China. The Award will be given to no more than two papers at each Chinese Control Conference.

READ MORE

Nov 2023

INTERNATIONAL SUSTAINABILITY AWARD IN THE JAMES DYSON AWARD

A student research team, comprising Mr. CHAN Hoi Fung Ronaldo (UG, EEEN) and Miss XIAO Can (Ph.D., MAE) under the supervision of Prof. CHEN Chun, has won the International Sustainability Award in the James Dyson Award for their invention "E-COATING". This marks the first time a team from the Greater China region has won this international award.

E-COATING is a cooling coating embodies the principles of circular economy. It is made from recycled waste glass, manufactured at a lower cost, and capable of reducing the indoor temperature of buildings without using electricity.

READ MORE

Dec 2023

THE 9TH CHINA INTERNATIONAL COLLEGE STUDENTS' "INTERNET+" INNOVATION AND ENTREPRENEURSHIP COMPETITION

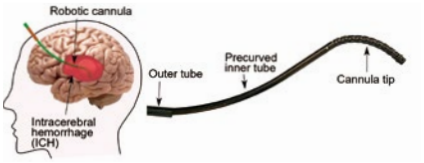
MAE student teams received two Gold Prizes at the National & Greater Bay Area Youth Innovation & Entrepreneurship Competitions – Hong Kong Regional Award Ceremony 2023, organised by the Hong Kong New Generation Cultural Association.

THE GOLD PRIZE PROJECT: AN INTELLIGENT ROBOTIC SYSTEM FOR NEUROSURGERY

Under the supervision of Prof. CHENG Shing Shin from the MAE Department and Prof. George WONG Kwok Chu from the Department of Surgery, Mr. YAN Junyan and his team members, Mr. QIU Yufu, Mr. CHEN Jibiao and Mr. FANG Haiyang from the MAE Department, have introduced the world's first flexible robot with an intelligent navigation system for neurosurgery. The robot's end effector can avoid damaging important functional areas of the brain and achieve a level of precision superior to the average neurosurgeon.

THE GOLD PRIZE PROJECT: DEXTEROUS MULTI-LAYER RIGID-FLEXIBLE HYBRID STRUCTURE ROBOTIC SYSTEM

The project team comprising Mr. WANG Xuchen, Mr. NG Wee Shen and Mr. LIN Hongbin has developed a series of multi-layer rigid-flexible hybrid structure robotic products that can dexterously perform difficult tasks in confined spaces, under the supervision of Prof. AU Kwok Wai Samuel and Prof. MA Xin from the MAE Department. These products include minimally invasive surgical robots for narrow physiological structures in ear, nose and throat surgery, as well as industrial robots for inspection and secondary machining of aerospace components with physically inaccessible or confined spaces.



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Dec 2023

THE 2023 NATIONAL UNDERGRADUATE ENGINEERING PRACTICE AND INNOVATION ABILITY COMPETITION

Miss LAM Yan Tung, Miss CHIANG Hiu Ying and Mr. CHUNG Tsz Lung from MAEG programme received the Bronze Award in the National Finals of the 2023 National Undergraduate Engineering Practice and Innovation Ability Competition in Changchun, Jilin.

The team designed an autonomous robot that could complete specific tasks such as getting tasks by scanning QR code, identifying and picking up different materials on the rotating disc, transporting materials to corresponding storage area, etc.

READ MORE

Mar 2024

GUANGDONG-HONG KONG-MACAO GREATER BAY AREA TERTIARY INSTITUTION INNOVATION PROJECT GBA INVITATIONAL COMPETITION

With good collaboration and teamwork between the MAE student team and Shenzhen Polytechnic University Team A Group, the joint team received the following six awards in the Guangdong-Hong Kong-Macao Greater Bay Area Tertiary Institution Innovation Project GBA Invitational Competition organised by The Hong Kong Institution of Engineers (the HKIE).

Awardees: Miss JIANG Tsz Yan (MAEG), Mr. FUNG Ho Yat Aaron (MAEG), Mr. TUNG Pok Man (MAEG), Mr. NGAN Ka Fai (MAEG) & Mr. NG Wai Nam (ENSC)

- Champion in Most Creative Remote Control Car Design Award
- 1st Runner-up in Fastest Remote Control Car Award
- 1st Runner-up in Most Eco-Friendly Bridge Design Award
- 2nd Runner-up in Most Creative Bridge Design Award
- 2nd Runner-up in Best Sandcastle Design Award
- 2nd Runner-up in Best Teamwork Award

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Mar 2024

2024 ASMEHK-CITYU STUDENT DESIGN COMPETITION

Two MAE student teams won the Champion and First Runner-up, respectively, in the 2024 ASMEHK-CityU Student Design Competition, hosted by the ASME Hong Kong Section. Each team was required to design and build a remotely controlled vehicle that could harvest renewable solar and/or wind energy for mechanical and transportation purposes.

CHAMPION

Mr. SZE Chun Ming, Mr. TANG Kwok Hei & Mr. YAU Chak Lai (UG, MAEG)

FIRST RUNNER-UP

Mr. CHAN Nok Shing, Mr. CHEUNG Ka Kiu, Miss CHING Wing Yan, Mr. CHOW Tsz Fung & Mr. LEUNG Ho Yin (UG, EEEN)

READ MORE

Jun 2024

THE VICE CHANCELLOR'S CUP OF STUDENT ENTREPRENEURSHIP 2024

Mr. ZHOU Cong (Ph.D., MAE), Dr. CHAN Hugo Hung Tin (Ph.D. Graduate, MAE), Dr. LIAO Hongpeng (Ph.D. Graduate, MAE), students of Prof. LIAO Wei-Hsin, won the Champion of The Vice Chancellor's Cup of Student Entrepreneurship (VCCE) 2024 for their project "Wearable Robot for Load Transportation".

Manual material handlers face the risk of developing low back pain due to lifting and lowering heavy loads, impacting their work efficiency, production costs, and daily life. The project specializes in advanced exoskeleton systems that protect the lower back, enhance mobility, strength, and endurance. The team has developed back-support exosuits, reducing physical burden by over 30% during manual lifting tasks.

READ MORE

Jul 2024

VTECH INNOVATION AND SUSTAINABILITY AWARD 2023/24

The following five students were awarded the VTech Innovation and Sustainability Award 2023/24 for their outstanding final year projects with elements of "Innovation" and "Sustainability".

Award	Awardee	Project Title
Champion	Mr. CHAN Hoi Fung Ronaldo (EEEN) (Supervisor: Prof. CHEN Chun)	Development of Low-Cost and Low-Carbon Passive Daytime Radiative Cooling Coating - E-COATING
1st Runner-up	Miss SUYANTO Pamela Wylona (EEEN) (Supervisor: Prof. ZHANG Weizhao)	Mechanical Properties Testing and Analysis of Woven Composite Preformed Structure Based on Experiment and Numerical Simulation
2nd Runner-up	Mr. CHEUNG Cheuk Him (MAEG) (Supervisor: Dr. HAN Dongkun)	E-platform Construction for the Aquaponics System in CUHK Smart Garden
Honorable Mentions	Mr. AU Ming Piu (MAEG) (Supervisor: Prof. ZHANG Weizhao)	Optimal Design of Lay-Up Structure and Mechanical Property Analysis for Modified Fiber Reinforced Composites
	Miss HUI Pak Kei (EEEN) (Supervisor: Dr. HAN Dongkun)	Renewable Energy Devices Development in CUHK Smart Garden

HONOURS AND AWARDS

	Name of Awardee(s)		Award
Jul 2021	Dr. CAI Mingjing Prof. LIAO Wei-Hsin (Supervisor)	Ph.D. Alumnus & Staff, MAE Faculty Member	Received the Faculty Outstanding PhD Thesis Award 2020, CUHK
Jul 2021	Prof. CHEN Fei	Faculty Member	Shortlisted as the Best Conference Paper Award Finalist at the IEEE International Conference on Advanced Robotics and Mechatronics 2021 (IEEE ARM 2021)
Jul 2021	Prof. LAU Tat Ming Darwin Mr. LEUNG Chun Ming Miss LAM Wai Yi Mr. KWOK Chun Keung	Faculty Member M.Phil. Alumnus, MAE MSc Alumna & Staff, MAE UG Alumnus & Staff, MAE	Received the Best Paper Award ("Application" Category) at the Fifth International Conference on Cable-Driven Parallel Robots (CableCon 2021)
Jul 2021	Mr. WANG Yan Mr. YIP Hoi Wut Mr. ZHENG Hao Mr. LIN Hongbin Prof. Russell H. TAYLOR Prof. AU Kwok Wai Samuel	Ph.D., MAE M.Phil. Alumnus, MAE Staff, MAE Ph.D., MAE Professor, Johns Hopkins University Faculty Member	Shortlisted as Best Student Paper Finalist at the 2021 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2021)
Jul 2021	Dr. JI Fengtong Prof. ZHANG Li (Supervisor)	Ph.D. Alumnus & Staff, MAE Faculty Member	Received the Best Oral Presentation Award - 1st Class at the International Youth Conference of Bionic Science and Engineering Conference 2021 (IYCBSE 2021)
Jul 2021	Dr. ZHOU Panpan Prof. CHEN Ben M. (Supervisor)	Ph.D. Alumna & Staff, MAE Faculty Member	Received the 2021 IEEE CSS Beijing Chapter Young Author Prize at the 40th Chinese Control Conference (CCC 2021)
Jul 2021	Prof. ZHANG Li	Faculty Member	Received the Research Fellow Award by the Research Grants Council of Hong Kong 2021/22
Jul 2021	Dr. XIE Jing Prof. LU Yi-Chun (Supervisor)	Ph.D. Alumna, MAE Faculty Member	Received the Postgraduate Research Output Award 2020, CUHK
Jul 2021	Prof. CHEN Fei	Faculty Member	Received the Best Student Paper Award at the 11th IEEE International Conference on Cyber Technology in Automation, Control and Intelligent Systems (IEEE-CYBER 2021)
Aug 2021	Prof. LIAO Wei-Hsin	Faculty Member	Appointed as Choh-Ming Li Professor of Mechanical and Automation Engineering, CUHK
Aug 2021	Prof. CHEN Shih-Chi	Faculty Member	Selected as Editors' Choice Article in the Journal of Precision Engineering
Aug 2021	Mr. HO Ka Chun Miss LI Wing Lam	UG, EEEN UG, GRM	Won the Champion (Tertiary Division) in the Hong Kong Green Building Council "My Green Space" Student Competition 2020-21
Aug 2021	Prof. ZHANG Li	Faculty Member	Received the Best Conference Paper Award at the 2021 IEEE International Conference on Manipulation, Manufacturing and Measurement on the Nanoscale (IEEE 3M-NANO 2021)
Aug 2021	Prof. LIAO Wei-Hsin Mr. CHAN Hugo Hung Tin Mr. LIAO Hongpeng Dr. GAO Fei Mr. ZHAO Xuan	Faculty Member Ph.D., MAE Ph.D., MAE Ph.D. Alumnus & Staff, MAE Staff, MAE	Received the Best Conference Paper Award at the 2021 IEEE International Conference on Mechatronics and Automation (IEEE ICMA 2021)
Aug 2021	Prof. LAU Tat Ming Darwin Mr. KWOK Chun Keung Dr. BHUTTA Muhammad Usman M. Prof. LEE Ho Man Jimmy Mr. HUI Hon Kit	Faculty Member UG Alumnus & Staff, MAE Staff, MAE Staff, CSE Staff, CSE	Received the Silver Poster Award (Pedagogical Innovation Category) in CUHK Teaching and Learning Innovation Expo 2021

	Name of Awardee(s)		Award
Aug 2021	Prof. LAU Tat Ming Darwin Dr. BHUTTA Muhammad Usman M. Miss LAM Wai Yi Mr. ZHAO Xinyan Prof. LEE Ho Man Jimmy	Faculty Member Staff, MAE MSc Alumna & Staff, MAE Staff, MAE Staff, CSE	Received the Gold Poster Award (Educational Technology Innovation Category) in CUHK Teaching and Learning Innovation Expo 2021
Aug 2021	Prof. LAU Tat Ming Darwin Dr. HAN Dongkun Mr. LAW Ka Ho Mr. HUANG Hejun Prof. LEE Ho Man Jimmy Prof. JAGGI Sidharth Prof. SO Man Cho Anthony Dr. WONG Tik Lun Franko	Faculty Member Faculty Member Staff, MAE Staff, MAE Staff, CSE Staff, IE Staff, SEEM Staff, CLEAR	Received the Silver Poster Award (Pedagogical Innovation Category) and the People's Poster Prize in CUHK Teaching and Learning Innovation Expo 2021
Aug 2021	Dr. HAN Dongkun Mr. LEUNG Yun Yee Martin (Support)	Faculty Member Staff, MAE	Received the Silver Poster Award (Pedagogical Innovation Category) in CUHK Teaching and Learning Innovation Expo 2021
Aug 2021	Prof. REN Wei	Faculty Member	Awarded China's Excellent Young Scientists Fund 2021
Aug 2021	Prof. LU Yi-Chun	Faculty Member	Received the CUHK Research Excellence Award 2020-21 in the Faculty of Engineering
Sep 2021	Prof. LU Yi-Chun	Faculty Member	Received the Xplorer Prize 2021 (established by Tencent Foundation)
Sep 2021	Dr. CAI Mingjing Dr. WANG Jiahua Prof. LIAO Wei-Hsin	Ph.D. Alumnus & Staff, MAE Ph.D. Alumnus, MAE Faculty Member	Received the 2020 Energy Harvesting TC Best Paper Award at the ASME 2021 Conference on Smart Materials, Adaptive Structures, and Intelligent Systems (ASME SMASIS 2021)
Sep 2021	Mr. CHEN Keyu Dr. GAO Qiang Dr. FANG Shitong Dr. ZOU Donglin Prof. LIAO Wei-Hsin	Ph.D., MAE Staff, MAE Ph.D. Alumna & Staff, MAE Staff, MAE Faculty Member	Received the 2021 Best Student Paper Award (2nd Place) at the ASME 2021 Conference on Smart Materials, Adaptive Structures, and Intelligent Systems (ASME SMASIS 2021)
Oct 2021	Prof. ZI Yunlong	Faculty Member	Received the Nano Energy Award at the 5th International Conference on Nanoenergy and Nanosystems 2021
Nov 2021	Mr. LI Pak Kiu	UG, MAEG	Received the Academic Creativity Award in the Yu-Luan Shih and Academic Creativity Awards 2020/2021, CUHK
Nov 2021	Mr. WANG Yintao Mr. SHAO Qi Mr. TIAN Zezhi Prof. CHEN Shih-Chi (Supervisor)	Ph.D., MAE Ph.D., MAE Ph.D., MAE Faculty Member	Won the First Place in the 2021 ASPE Student Challenge, American Society for Precision Engineering
Nov 2021	Mr. LIU Wai Shing Mr. CHENG Chak Kit Prof. ZHANG Li (Advisor) Dr. CHAN Kai Fung (Advisor)	Ph.D., MAE MSc, BME Faculty Member Staff, TCIM	Received the Bronze Award & Clinical Readiness Award in the Engineering Medical Innovation Global Competition 2021 (EMedIC Global 2021)
Nov 2021	Miss WANG Xingyu Miss KWOK Tien Wing Mr. WANG Wenhao Mr. CHEN Yiwei Prof. XU Dongyan (Supervisor) Dr. LI Yiyang (Supervisor)	UG, MAEG UG, MAEG UG, MAEG UG, EEEN Faculty Member Faculty Member	Received the Silver Award in the Intelligent Logistics Handling of the "Smart +" Category in the national finals of the 2021 China University Students Engineering Practice and Innovation Ability Competition
Dec 2021	Prof. YAM Yeung	Faculty Member	Received the Gold Award in the Smart People (Smart Education and Learning) Category in the Hong Kong ICT Awards 2021
Dec 2021	Dr. HAN Dongkun	Faculty Member	Received the Gold Award in the Technology Innovation Award Category at the 16th eLearning Forum Asia 2021
Dec 2021	Dr. LI Zhejun Prof. LU Yi-Chun (Supervisor)	Ph.D. Alumna, MAE Faculty Member	Received the 2021 Young Scientist Award in Engineering Science from the Hong Kong Institution of Science
Dec 2021	Dr. BIAN Ye Prof. CHEN Chun (Co-supervisor) Prof. ZHANG Li (Co-supervisor)	Ph.D. Alumnus, BME Faculty Member Faculty Member	Shortlisted as the 2021 Young Scientist Award Finalist in Engineering Science by the Hong Kong Institution of Science
Dec 2021	Prof. CHEN Fei	Faculty Member	Shortlisted as the T.J. Tarn Best Paper in Robotics Award Finalist at the 2021 IEEE International Conference on Robotics and Biomimetics (IEEE-ROBIO 2021)
Dec 2021	Prof. LIU Yun-Hui Prof. CHENG Shing Shin Prof. ZHOU Jianshu Prof. TONG Chi Fai Michael	Faculty Member Faculty Member Faculty Member Staff, ENT	Shortlisted as the Best Paper in Biomimetics Award Finalist at the 2021 IEEE International Conference on Robotics and Biomimetics (IEEE-ROBIO 2021)
Dec 2021	Prof. CHEN Shih-Chi	Faculty Member	Received the 2021 Outstanding Reviewer Award from the Optical Society of America (Optica)
Jan 2022	Prof. CHEN Yue	Faculty Member	Received the Outstanding Reviewer Award of IEEE Transactions on Smart Grid in 2021
Jan 2022	Prof. ZHANG Li	Faculty Member	Elected as Fellow of the Royal Society of Chemistry (FRSC)
Mar 2022	Refer to the 'Feature Awards' section.		Won 1 Gold Medal & 2 Silver Medals at the International Exhibition of Inventions Geneva 2022

	Name of Awardee(s)		Award
Mar 2022	Mr. WANG Yan Mr. LIN Hongbin Mr. WANG Xuchen Prof. AU Kwok Wai Samuel (Supervisor)	Ph.D., MAE Ph.D., MAE Ph.D., MAE Faculty Member	Won the Top Prize at the 17th "Challenge Cup" National College Students' Extracurricular Academic Science and Technology Contest
Mar 2022	Mr. KWOK Chun Keung Prof. LAU Tat Ming Darwin (Supervisor)	UG Alumnus & Staff, MAE Faculty Member	Received the Second Prize at the 17th "Challenge Cup" National College Students' Extracurricular Academic Science and Technology Contest
Apr 2022	Mr. CHOW Tsun Yu Mr. CHEUNG Cheuk Yuen Mr. TSE Siu Hung Henry Miss FONG Ching Man Prof. XU Dongyan (Supervisor) Dr. LI Yiyang (Supervisor) Mr. LEUNG Yun Yee Martin (Assessor) Mr. YU Siu Ning (Assessor)	UG, MAEG UG, MAEG UG, MAEG UG, EEEN Faculty Member Faculty Member Staff, MAE Staff, MAE	Received the First Runner-up in the 10th Greater China Region Design Competition 2022
May 2022	Refer to the 'Student Achievements' section.		Received 4 Second Prizes, 3 Third Prizes & 4 Merit Prizes at the 8th Hong Kong University Student Innovation and Entrepreneurship Competition
Jun 2022	Dr. HAN Dongkun	Faculty Member	Received the University Education Award 2022 (Early Career Faculty Members), CUHK
Jun 2022	Dr. FANG Shitong Prof. LIAO Wei-Hsin (Supervisor)	Ph.D. Alumna & Staff, MAE Faculty Member	Received the Faculty Outstanding PhD Thesis Award 2021
Jun 2022	Golden Striker	CUHK Robotics Team	Won the Champion and the Best Team Spirit Award in Robocon 2022 Hong Kong Contest
Jun 2022	Power Builder	CUHK Robotics Team	Received the 3rd Runner-up in Robocon 2022 Hong Kong Contest
Jun 2022	Prof. SONG Xu Dr. GAO Shiming Mr. DING Junhao	Faculty Member Ph.D. Alumnus, MAE Ph.D., MAE	Received the Red Dot Award: Design Concept 2022
Jun 2022	Mr. LEUNG Hing Chun Mr. LI Fengsen Miss NG Hui Yin Mr. YIM Ming Yeung Arthur Prof. WONG Hay (Supervisor)	UG, MAEG UG, MAEG UG, MAEG UG, MAEG Faculty Member	Received the Outstanding Award in ASM Technology Award 2022
Jun 2022	Refer to the 'Student Achievements' section.		Won the Champion, 1st Runner-up, 2nd Runner-up & two Honorable Mentions in the VTech Innovation and Sustainability Award 2021/22
Jun 2022	Mr. LIN Hongbin Mr. LI Bin Prof. AU Kwok Wai Samuel (Supervisor)	Ph.D., MAE Ph.D., MAE Faculty Member	Received the First Place in the 2021-2022 AccelNet Surgical Robotics Challenge (Online)
Jul 2022	Dr. HAN Dongkun	Faculty Member	Received the Dean's Exemplary Teaching Award 2021, Faculty of Engineering, CUHK
Jul 2022	Dr. XIE Jing Prof. LU Yi-Chun (Supervisor)	Ph.D. Alumna, MAE Faculty Member	Received the CUHK Young Scholars Thesis Award 2021, CUHK
Jul 2022	Prof. CHEN Ben M.	Faculty Member	Received the Outstanding Contribution Award, Technical Committee on Control Theory, Chinese Association of Automation
Jul 2022	Mr. ZHANG Moqiu Mr. YANG Lidong Mr. YANG Haojin Miss SU Lin Prof. ZHANG Li (Supervisor)	Ph.D., MAE Ph.D. Alumnus, MAE Ph.D., MAE Ph.D., MAE Faculty Member	Received the Best Student Paper Award at the 2022 International Conference on Manipulation, Automation and Robotics at Small Scales (MARSS 2022)
Jul 2022	Mr. LI Zhihao Mr. ZHENG Shuaishuai Mr. DONG Zhipeng Dr. LI Miao Prof. CHEN Fei	Ph.D., MAE M.Phil., MAE Staff, CURI Staff, Wuhan University Faculty Member	Shortlisted as Best Paper Award Finalist at the 12th IEEE International Conference on CYBER Technology in Automation, Control, and Intelligent Systems (IEEE-CYBER 2022)
Aug 2022	Prof. LU Yi-Chun	Faculty Member	Awarded the title of "RGC Research Fellow" under the 2022-23 Research Grants Council (RGC) Research Fellow Scheme
Aug 2022	Prof. LU Yi-Chun	Faculty Member	Won the Bronze Award in the TERA-Award Smart Energy Innovation Competition organised by the Hong Kong and China Gas Company Limited and State Power Investment Corporation (Start-up: Luquos Energy)
Aug 2022	Golden Striker	CUHK Robotics Team	Won the Grand Prix Award & Panasonic Award at the Asia-Pacific Broadcasting Union's Asia-Pacific Robot Contest (ABU Robocon) 2022
Sep 2022	Prof. HUANG Jie Dr. WANG Tianqi	Faculty Member Ph.D. Alumnus, MAE	Won the Unmanned Systems' Best Paper Award 2019-2020 (Theory Category) (awarded by Beijing Institute of Technology & World Scientific)
Sep 2022	Prof. ZHANG Li	Faculty Member	Shortlisted as Finalist for the Falling Walls Science Breakthroughs of the Year 2022 in Engineering and Technology

	Name of Awardee(s)		Award
Sep 2022	Prof. CHEN Shih-Chi Dr. ZHONG Qiuyuan Dr. XU Xiayi	Faculty Member Staff, MAE Staff, MAE	Won the Champion in the CUHK Entrepreneurship Competition 2022 (Start-up: Precision Cut)
Oct 2022	Prof. MA Xin	Faculty Member	Received the National Natural Science Foundation of China's (NSFC) Young Scientists Fund 2022
Oct 2022	Prof. ZHANG Li Prof. CHAN Kai Fung Mr. LIU Wai Shing	Faculty Member Staff, TCIM Ph.D., MAE	Received the Most Innovative Technology Award in Elevator Pitch Competition on CUHK Innovation Day 2022 (Company: MicroMag Healthcare Limited)
Oct 2022	Dr. LIU Tao Prof. HUANG Jie (Supervisor)	Ph.D. Alumnus, MAE Faculty Member	Received the National Natural Science Foundation of China's (NSFC) Excellent Young Scientists Fund (Overseas) 2022
Oct 2022	Prof. LIAO Wei-Hsin Dr. Mahdi BODAGHI	Faculty Member Staff, MAE	Received the China Top Cited Paper Award by IOP Publishing
Nov 2022	Dr. YAN Yamin Prof. HUANG Jie (Supervisor)	Ph.D. Alumna, MAE Faculty Member	Selected as one of the Rising Stars Women at the Asian Deans' Forum 2022 – The Rising Stars Women in Engineering Workshop
Nov 2022	Prof. CHEN Shih-Chi	Faculty Member	Elected as Fellow of Optica (formerly OSA)
Nov 2022	Prof. ZHANG Li Prof. XIE Hui Dr. SUN Mengmeng	Faculty Member Staff, Harbin Institute of Technology, China Staff, MAE	Received the Pineapple Science Award 2022 – Invention Award
Nov 2022	Dr. FU Xinlei Dr. ZHONG Qiuyuan Dr. XU Xiayi Prof. CHEN Shih-Chi	Ph.D. Alumnus, MAE Staff, MAE Staff, MAE Faculty Member	Received the Silver Medal at the 8th China International College Students' "Internet+" Innovation and Entrepreneurship Competition
Nov 2022	Mr. CHEN Keyu Dr. FANG Shitong Prof. LIAO Wei-Hsin	Ph.D., MAE Ph.D. Alumna & Staff, MAE Faculty Member	Received the Best Student Paper Award – Gold Award at the 32nd International Conference on Adaptive Structures and Technologies (ICAST 2022)
Nov 2022	Mr. XING Juntong Dr. FANG Shitong Dr. FU Xinlei Prof. LIAO Wei-Hsin	Ph.D., MAE Ph.D. Alumna & Staff, MAE Ph.D. Alumnus, MAE Faculty Member	Received the Best Student Paper Award – Silver Award at the 32nd International Conference on Adaptive Structures and Technologies (ICAST 2022)
Dec 2022	Dr. YANG Lidong Prof. ZHANG Li (Supervisor)	Staff, MAE Faculty Member	Shortlisted as the 2022 Young Scientist Award Finalist in Engineering Science by the Hong Kong Institution of Science
Dec 2022	Prof. ZHOU Jianshu Prof. LIU Yun-Hui	Faculty Member Faculty Member	Shortlisted as Best Conference Paper Finalist at the 2022 IEEE International Conference on Robotics and Biomimetics (IEEE ROBIO 2022)
Dec 2022	Prof. LAU Tat Ming Darwin	Faculty Member	Received the Young Innovator Prize in the Hong Kong Construction Industry Council (CIC) Construction Innovation Award 2022
Dec 2022	Dr. HAN Dongkun Prof. LEE Tan	Faculty Member Staff, EE	Received the Gold Poster Award (Educational Technology Innovation Category) in the CUHK Teaching and Learning Innovation Expo 2022
Dec 2022	Prof. ZHANG Li	Faculty Member	Elected as Fellow of Asia-Pacific Artificial Intelligence Association (AAIA)
Dec 2022	Prof. ZHANG Li Dr. SUN Mengmeng Mr. HAO Bo Mr. WANG Xin	Faculty Member Staff, MAE Ph.D., MAE Ph.D., MAE	Research on magnetic slime robot selected as Top 10 Innovation and Technology News in Hong Kong in 2022 (organised by the Beijing-Hong Kong Academic Exchange Centre)
Jan 2023	Prof. ZHANG Li	Faculty Member	Elected as Fellow of IEEE in the class of 2023
Jan 2023	Mr. AN Yuting Mr. NIU Zhuolun Prof. CHEN Chun	Ph.D., MAE Ph.D., MAE Faculty Member	Received the 2022 Best Paper Award for a Young Author from journal Building and Environment
Feb 2023	Prof. CHEN Shih-Chi Dr. FU Xinlei Dr. ZHONG Qiuyuan Dr. XU Xiayi	Faculty Member Ph.D. Alumnus, MAE Staff, MAE Staff, MAE	Won the Gold Medal at the 13th International Invention Fair in the Middle East (IIFME)
Feb 2023	Prof. LAU Tat Ming Darwin Dr. SUM Kwok Wing Anthony Prof. LEE Ho Man Jimmy Mr. LI Dickson Chun Fung Mr. LEUNG Chun Ming Mr. CHAN Hing Cheung Mr. LAM Yip Fu	Faculty Member Staff, CSE Staff, CSE Staff, MAE M.Phil., MAE M.Phil. Alumnus, MAE Staff, MAE	Won the Gold Medal at the 13th International Invention Fair in the Middle East (IIFME)
Feb 2023	Prof. ZHANG Li	Faculty Member	Elected as Fellow of International Association of Advanced Materials (IAAM)
Mar 2023	Refer to the 'Student Achievements' section.		Received 2 Second Prizes in the 3rd Guangdong-Hong Kong-Macao Undergraduate Engineering Practice and Innovation Ability Competition
Apr 2023	Miss HUANG Wenjie Miss GUO Kangqi Dr. PAN Yue Prof. CHEN Chun	Ph.D., MAE Ph.D., MAE Staff, MAE Faculty Member	Received the Young Investigator Award of the first-ever International Conference on Far-UVC Science and Technology (ICFUST)

	Name of Awardee(s)		Award
Apr 2023	Miss GUO Kangqi Dr. PAN Yue Mr. CHAN Hoi Fung Ronaldo Prof. CHEN Chun	Ph.D., MAE Staff, MAE UG, EEEN Faculty Member	Received the Young Investigator Award of the first-ever International Conference on Far-UVC Science and Technology (ICFUST)
Apr 2023	Mr. CHEN Jibiao Mr. YAN Junyan Prof. CHENG Shing Shin (Supervisor)	Ph.D., MAE Ph.D., MAE Faculty Member	Won the Gold Prize at the 13th Challenge Cup China College Students' Entrepreneurship Competition
Apr 2023	Dr. HAN Dongkun	Faculty Member	Received the Best Oral Presentation Award at the 9th International Conference on Education and Training Technologies (ICETT 2023)
Apr 2023	Refer to the 'Feature Awards' section.		Won 1 Gold Medal with Congratulation of the Jury, 1 Gold Medal, 5 Silver Medals & 2 Bronze Medals at the International Exhibition of Inventions Geneva 2023
May 2023	Prof. AU Kwok Wai Samuel	Faculty Member	Shortlisted as one of the 2023 Science and Technology Entrepreneurs (organized by 36Kr Holdings Inc.)
Jun 2023	Refer to the 'Student Achievements' section.		Won 3 Champions, 1 First Runner-up, 3 Second Runner-ups, 1 Merit Prize & 1 Special Award in Professor Charles K. Kao Student Creativity Awards 2023, CUHK
Jun 2023	Dr. HAN Dongkun	Faculty Member	Received the Best Presentation Award at the 5th International Conference on Modern Educational Technologies (ICMET 2023)
Jun 2023	Refer to the 'Student Achievements' section.		Won 1 Grand Prize, 1 First Prize, 2 Second Prizes & 2 Merit Prizes at the 9th Hong Kong University Student Innovation and Entrepreneurship Competition
Jun 2023	Prof. LIU Yun-Hui	Faculty Member	Selected as Leader of the Year 2022 (Education / Professions / Technology and Innovation Award Category) (organized by Sing Tao News Corporation Limited)
Jun 2023	The Lord of the Rings	CUHK Robotics Team	Won the Champion & Best Engineering Award in Robocon 2023 Hong Kong Contest
Jun 2023	Ring Slinger	CUHK Robotics Team	Received the 3rd Runner-up in Robocon 2023 Hong Kong Contest
Jun 2023	Prof. ZHANG Li	Faculty Member	Selected as Finalist of 2023 Best Transaction Paper Award for 2023 IEEE/ASME Transactions on Mechatronics
Jun 2023	Refer to the 'Student Achievements' section.		Won the Champion, 1st Runner-up, 2nd Runner-up & two Honorable Mentions in the VTech Innovation and Sustainability Award 2022/23
Jul 2023	Dr. WANG Yuqiong Prof. ZHANG Li (Supervisor)	Staff, MAE Faculty Member	Received the Outstanding Oral Presentation Award in the Hong Kong Scholars Program Annual Academic Exchange Meeting 2023
Jul 2023	Prof. CHEN Shih-Chi	Faculty Member	Elected as Fellow of the American Society of Mechanical Engineers (ASME)
Jul 2023	Mr. JIANG Jialin Dr. YANG Lidong Prof. ZHANG Li	Ph.D., MAE Ph.D. Alumnus, MAE Faculty Member	Selected as Best Paper Finalist at the 2023 IEEE International Conference on Real-time Computing and Robotics (IEEE RCAR 2023)
Jul 2023	Mr. DOU Minghao Mr. LIU Xuchen Mr. HUANG Dongyue Prof. CHEN Ben M.	Ph.D., MAE Ph.D., MAE Ph.D., MAE Faculty Member	Won the Guan Zhao-Zhi Award at the 42nd Chinese Control Conference (CCC 2023)
Jul 2023	Mr. AI Fei Prof. LU Yi-Chun (Supervisor)	Ph.D., MAE Faculty Member	Received the Postgraduate Research Output Award 2022, CUHK
Aug 2023	Mr. GU Songyun	Ph.D., MAE	Received the Second Prize at the National Finals of Light Doctoral Academic League 2023
Aug 2023	Prof. CHEN Shih-Chi	Faculty Member	Received the Outstanding Mentor Award at the National Finals of Light Doctoral Academic League 2023
Aug 2023	Prof. CHEN Shih-Chi	Faculty Member	Selected as a Winner for the Falling Walls Science Breakthroughs of the Year 2023 in Engineering and Technology
Aug 2023	Prof. LIAO Wei-Hsin	Faculty Member	Won the 2023 Leonardo Da Vinci Award from the Design Engineering Division of the American Society of Mechanical Engineers (ASME)
Aug 2023	The Lord of the Rings	CUHK Robotics Team	Won the 1st Runner-Up & Best Design Award at the Asia-Pacific Broadcasting Union's Asia-Pacific Robot Contest (ABU Robocon) 2023
Aug 2023	Dr. HAN Dongkun	Faculty Member	Received the Best Presentation Award in the 7th International Conference on Education and Multimedia Technology (ICEMT 2023)
Sep 2023	Dr. CHEN Keyu Prof. FANG Shitong Prof. GAO Qiang Prof. ZOU Donglin Prof. CAO Junyi Prof. LIAO Wei-Hsin	Ph.D. Alumnus & Staff, MAE Ph.D. Alumna, MAE Former Staff, MAE Former Staff, MAE Staff, Xi'an Jiaotong University Faculty Member	Won the SMASIS Division Best Paper Award in Structural Dynamics and Control at the ASME 2023 Conference on Smart Materials, Adaptive Structures, and Intelligent Systems (ASME SMASIS 2023)

	Name of Awardee(s)		Award
Sep 2023	Prof. CHEN Yue	Faculty Member	Received funding award from the National Natural Science Foundation of China's (NSFC) Young Scientists Fund 2023
Sep 2023	Prof. WANG Zhen	Faculty Member	Received funding award from the National Natural Science Foundation of China's (NSFC) Young Scientists Fund 2023
Nov 2023	Mr. CHAN Hoi Fung Ronaldo Miss XIAO Can Prof. CHEN Chun (Supervisor)	UG, EEEN Ph.D., MAE Faculty Member	Won the International Sustainability Award in the James Dyson Award
Dec 2023	Prof. ZHANG Li Prof. CHIU Wai Yan Philip Prof. CHAN Kai Fung Dr. SUN Mengmeng Mr. LIU Wai Shing	Faculty Member Staff, Surgery Staff, TCIM Ph.D. Alumnus, MAE Ph.D., MAE	Won Gold Medal at the 3rd Asia Exhibition of Innovations and Inventions Hong Kong (AEII 2023)
Dec 2023	Prof. ZHANG Li Prof. CHIU Wai Yan Philip Prof. CHAN Kai Fung Dr. ZHANG Chong	Faculty Member Staff, Surgery Staff, TCIM Ph.D., BME	Won Gold Medal at the 3rd Asia Exhibition of Innovations and Inventions Hong Kong (AEII 2023)
Dec 2023	Refer to the 'Student Achievements' section.		Won 2 Gold Prizes in the 9th China International College Students' "Internet+" Innovation and Entrepreneurship Competition
Dec 2023	Miss LAM Yan Tung Miss CHIANG Hiu Ying Mr. CHUNG Tsz Lung Dr. LI Yiyang (Co-Supervisor) Mr. LEUNG Yun Yee Martin (Co-Supervisor)	UG, MAEG UG, MAEG UG, MAEG Faculty Member Staff, MAE	Received the Bronze Award in the National Finals of the 2023 National Undergraduate Engineering Practice and Innovation Ability Competition
Jan 2024	Prof. CHEN Shih-Chi	Faculty Member	Elected as Fellow of SPIE (The International Society for Optics and Photonics)
Jan 2024	Dr. HAN Dongkun	Faculty Member	Received the Best Presentation Award in the 5th International Conference on Advances in Education and Information Technology (AEIT 2024)
Jan 2024	Prof. CHEN Yue Dr. YAN Dongxiang	Faculty Member Staff, MAE	Received the Third Prize of Excellent Paper for Automation of Electric Power Systems in 2022
Jan 2024	Prof. CHEN Yue	Faculty Member	Received the 2023 Annual Highly Cited Paper Award for Energy Conversion and Economics
Jan 2024	Prof. CHEN Yue	Faculty Member	Received the Excellent Reviewer Award for Automation of Electric Power Systems in 2023
Jan 2024	Prof. CHEN Yue	Faculty Member	Received the Outstanding Associate Editor Award of the Energy Conversion and Economics 2023
Jan 2024	Prof. AU Kwok Wai Samuel	Faculty Member	Received the 2023 Deloitte Hong Kong Rising Star Award (Company: Cornerstone Robotics Limited)
Jan 2024	Prof. REN Wei	Faculty Member	Received the 2023 Deloitte Hong Kong Rising Star Award (Company: LaSense Technology Limited)
Jan 2024	Prof. CHEN Yue	Faculty Member	Received the 2023 Best Paper Award for Journal of Economy and Technology
Feb 2024	Dr. HAN Dongkun	Faculty Member	Received the Best Oral Presentation Award in the 16th International Conference on Machine Learning and Computing (ICMLC 2024)
Feb 2024	Mr. WANG Qinglong Prof. CHAN Kai Fung Mr. XIA Neng Mr. YANG Haojin Prof. YU Chun Ho Simon Prof. ZHANG Li	Ph.D., MAE Staff, TCIM Staff, MAE Ph.D., MAE Staff, DIIR Faculty Member	Selected as Hong Kong's Top 10 Innovation and Technology News 2023 by Beijing - Hong Kong Academic Exchange Centre for the project "Swarming self-adhesive microgels enabled aneurysm on-demand embolization in physiological blood flow"
Feb 2024	Prof. CHEN Chun Mr. CHAN Hoi Fung Ronaldo Miss XIAO Can	Faculty Member UG, EEEN Ph.D., MAE	Won Gold Medal at the 14th International Invention Fair in the Middle East (IIFME 2024)
Feb 2024	Prof. ZHANG Li Prof. CHIU Wai Yan Philip Dr. SUN Mengmeng Prof. CHAN Kai Fung Mr. LIU Wai Shing	Faculty Member Staff, Surgery Ph.D. Alumnus, MAE Staff, TCIM Ph.D., MAE	Won Gold Medal at the 14th International Invention Fair in the Middle East (IIFME 2024)
Feb 2024	Prof. ZHANG Li Prof. CHIU Wai Yan Philip Prof. CHAN Kai Fung Dr. ZHANG Chong	Faculty Member Staff, Surgery Staff, TCIM Ph.D., BME	Received Silver Medal at the 14th International Invention Fair in the Middle East (IIFME 2024)
Mar 2024	Prof. CHEN Yue	Faculty Member	Received the Outstanding Reviewer Award for the IEEE Transactions on Power Systems 2023
Mar 2024	Prof. ZHANG Li	Faculty Member	Appointed as the Associate Editor of editorial board for Research (ISSN: 2096-5168, CN: 10-1541/N), a Science Partner Journal, from Feb 2024 to Feb 2027

	Name of Awardee(s)		Award
Mar 2024	Miss JIANG Tsz Yan Mr. FUNG Ho Yat Aaron Mr. TUNG Pok Man Mr. NGAN Ka Fai Mr. NG Wai Nam Mr. YIP Chun Wa (Instructor)	UG, MAEG UG, MAEG UG, MAEG UG, MAEG UG, ENSC Staff, MAE	Won the Champion in Most Creative Remote Control Car Design Award, 1st Runner-up in Fastest Remote Control Car Award, 1st Runner-up in Most Eco-Friendly Bridge Design Award, 2nd Runner-up in Most Creative Bridge Design Award, 2nd Runner-up in Best Sandcastle Design Award, and 2nd Runner-up in Best Teamwork Award in the Guangdong-Hong Kong-Macao Greater Bay Area Tertiary Institution Innovation Project GBA Invitational Competition
Mar 2024	Prof. ZHANG Li	Faculty Member	Achieved the top 10% of papers published in Advanced Intelligent Systems for the paper "Control and Autonomy of Microrobots: Recent Progress and Perspective"
Mar 2024	Prof. LU Yi-Chun	Faculty Member	Received the Hong Kong Engineering Science and Technology Award 2023
Mar 2024	Refer to the 'Student Achievements' section.		Won the Champion & First Runner-up in the 2024 ASMEHK-CityU Student Design Competition
Apr 2024	Refer to the 'Feature Awards' section.		Won 2 Gold Medals & 1 Silver Medal at the 49th International Exhibition of Inventions Geneva 2024
Apr 2024	Prof. CHEN Shih-Chi Dr. GU Songyun Dr. HAN Fei Prof. ZHAO Ni Prof. ZHAO Yongxin Dr. Aleks KLIMAS	Faculty Member Staff, MAE Staff, MAE Staff, EE Staff, Carnegie Mellon University Staff, Carnegie Mellon University	Received the 2023 Award for China's Top 10 Optical Breakthroughs (Fundamental Research)
Apr 2024	Prof. ZHANG Li	Faculty Member	Elected as Outstanding Editor for journal Research in 2023
Apr 2024	Miss SU Lin Prof. ZHANG Li (Supervisor)	Ph.D., MAE Faculty Member	Received the Second Prize in the 2024 National Outstanding Graduate Students Workshop organized by the School of Science and Engineering, CUHK-Shenzhen
Apr 2024	Mr. WANG Qinglong Prof. ZHANG Li (Supervisor)	Ph.D., MAE Faculty Member	Received the Third Prize in the 2024 National Outstanding Graduate Students Workshop organized by the School of Science and Engineering, CUHK-Shenzhen
Apr 2024	Mr. WANG Qinglong Prof. ZHANG Li (Supervisor)	Ph.D., MAE Faculty Member	Received the Second Prize in the 4th National Conference on Micro and Nanomotors 2024
May 2024	Dr. HAN Dongkun	Faculty Member	Selected for the Vice-Chancellor's Exemplary Teaching Award 2023, CUHK
May 2024	Prof. ZHOU Jianshu	Faculty Member	Received the IEEE Robotics and Automation Letters Outstanding Reviewer at the IEEE International Conference on Robotics and Automation 2024 (IEEE ICRA 2024)
May 2024	Dr. CHU Xiangyu	Staff, MAE	Received the IEEE Robotics and Automation Letters Outstanding Reviewer at the IEEE International Conference on Robotics and Automation 2024 (IEEE ICRA 2024)
May 2024	Prof. AU Kwok Wai Samuel	Faculty Member	Received funding support from the Research, Academic and Industry Sectors One-plus Scheme (RAISe+ Scheme) by The Innovation and Technology Commission, Hong Kong SAR
May 2024	Prof. LIU Yun-Hui	Faculty Member	Received funding support from the Research, Academic and Industry Sectors One-plus Scheme (RAISe+ Scheme) by The Innovation and Technology Commission, Hong Kong SAR
May 2024	Prof. LU Yi-Chun	Faculty Member	Received the Outstanding Research Impact Award 2023-24 in the Faculty of Engineering, CUHK
Jun 2024	Dr. XIA Neng Prof. ZHANG Li (Supervisor)	Ph.D. Alumnus, MAE Faculty Member	Received the Best PhD Thesis Award of the Faculty of Engineering, CUHK
Jun 2024	Dr. CHAN Hugo Hung Tin Dr. LIAO Hongpeng Mr. ZHOU Cong Prof. LIAO Wei-Hsin (Supervisor)	Ph.D. Alumnus & Staff, MAE Ph.D. Alumnus & Staff, MAE Ph.D., MAE Faculty Member	Won the Champion of the Vice Chancellor's Cup of Student Entrepreneurship (VCCE) 2024, CUHK
Jun 2024	Mr. CHEN Wei Mr. LU Yiang Mr. LI Bin Mr. CAO Hanwen Prof. ZHOU Jianshu Prof. CHEN Fei Prof. LIU Yun-Hui	Ph.D., MAE Ph.D., MAE Ph.D., MAE Ph.D., MAE Faculty Member Faculty Member Faculty Member	Shortlisted as IEEE ICCA 2024 Best Paper Finalists at the 18th IEEE International Conference on Control & Automation
Jun 2024	Wonder Seed	CUHK Robotics Team	Won the Champion in Robocon 2024 Hong Kong Contest
Jun 2024	Golden Farmer	CUHK Robotics Team	Received the First Runner-up & Best Performance Award in Robocon 2024 Hong Kong Contest
Jun 2024	Mr. LEE Pak Ho	UG, MAEG	Received the Key Influencer Award in Robocon 2024 Hong Kong Contest
Jun 2024	Dr. HAN Dongkun	Faculty Member	Received the Best Paper Award in the 8th International Conference on Education and Multimedia Technology (ICEMT 2024)
Jun 2024	Dr. HAN Dongkun	Faculty Member	Received the SCGE Exemplary Teaching Award in General Education 2023, CUHK

STUDENT EXCHANGE & INTERNSHIP

EXCHANGE PROGRAMME SHARING

Interested students can join the exchange programme during their second or third year at CUHK. The exchange programme generally lasts for either a term, a summer, or an academic year. Students can choose from over 270 destinations, including Asia, Australia, Europe, the United States, and Africa.

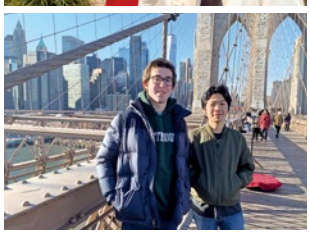
CHIANG Hiu Ying
Major: B.Eng. in MAEG
Study Year: 4
Exchange Location: Austria
University: Graz University of Technology

As a fourth-year student, I was honoured to be selected for a Master's course in Austria. This was a remarkable opportunity, as many European countries place a strong emphasis on investing in various industries to enhance the quality of life for their citizens. In particular, the Master's programme I enrolled in focused heavily on automotive engineering and autonomous driving technologies. This experience was incredibly insightful and allowed me to delve deeper into cutting-edge advancements in this field.

The chance to study abroad was incredibly enriching on a personal level. I had the privilege of meeting people from all over the world, each with their unique perspectives and experiences. These interactions not only expanded my understanding of different cultures and customs but also helped me develop invaluable communication and interpersonal skills.

This exchange programme has been a truly transformative experience. Not only have I gained a wealth of academic knowledge, but I have also grown as an individual, becoming more open-minded, adaptable, and culturally aware. This journey has broadened my horizons and left an indelible mark on my personal and professional development.

WIDJAJA Oliver
Major: B.Eng. in MAEG
Study Year: 3
Exchange Location: United States
University: Dartmouth College



My short-but-sweet exchange program to Dartmouth College exposed me to various opportunities, intercultural friends, and contrasting cultural practices.

Upon taking a course called 'Design Thinking,' I have learned how to tackle engineering problems with a human-centered approach. This involves brainstorming creatively from the user's point of view, not dismissing a bad idea immediately, as it might be a stepping stone to a better one, and thinking deeply about human needs so that solutions resonate more effectively.

A memorable quote from a local friend during my struggle to adjust to their heavy workload was, "Things will always work out in the end". While the phrase should not be taken for granted, given the proper considerations and efforts by oneself, things will fall into place more easily.

The key takeaway from this experience is to "play hard and study hard".

YAN Jiayin Katerina
Major: B.Eng. in MAEG
Study Year: 4
Exchange Location: Austria
University: Graz University of Technology

My year-long exchange at Graz University of Technology has been a truly valuable experience for me. Although I am an undergraduate exchange student, I was allowed to register for any master's courses. Therefore, I had the chance to explore both mechanical and software engineering at the master's level.

Apart from my studies, I also joined the Formula Student, a global competition to race a small-scale formula-style racing car. I was a member of the Vehicle Dynamics and Data Acquisition, responsible for simulating the Two-Track model. Additionally, I participated in the manufacturing of the car body, which provided me with first-hand experience of the manufacturing process. Working with Austrian engineering students was a lot of fun. They could party all night but also stay awake for several nights to get things done. While we sometimes encountered language barriers, they always did their best to teach me and help me solve technical issues.

I am grateful for the opportunity to explore many unique experiences in Austria. Danke dir (Thank you)!

SUYANTO Pamela Wylona
Major: B.Eng. in EEEN
Study Year: 4
Exchange Location: United States
University: Purdue University Fort Wayne

During my third year, I had the incredible opportunity to participate in a semester-long exchange programme at the Purdue University Fort Wayne.

This experience allowed me to immerse myself in a new culture, where I enjoyed experiencing a different winter with beautiful snow. Meeting new friends from diverse backgrounds enriched my perspective and created lasting connections.

Academically, I took engaging courses such as Material Engineering, Heat Transfer, and a beginner's course in Psychology, which provided a refreshing change from my engineering background. The classes were taught in a style different from what I was accustomed to at CUHK, making the classes both interesting and fun.

One highlight was visiting a local metal industry lab, where I gained practical insights into real-world applications. Interacting with professors was another enriching experience, as they were approachable and eager to share their knowledge. Additionally, I explored Chicago with my friends, marveling at landmarks like "The Bean".

I am grateful to the MAE Department and CUHK for this unforgettable experience, which has significantly broadened my skills and worldview.

INTERNSHIP SHARING

The **Work Study Programme** is designed for students who have completed their penultimate year of study and are interested in taking a gap year to participate in a one-year internship. Participating companies will offer a structured training programme with proper supervision, allowing students to acquire a diverse set of skills and gain valuable exposure to a practical working environment.

Students are also encouraged to participate in summer internships to gain valuable work experience.

CHAN Yin Wai
Major: B.Eng. in MAEG
Study Year: Year 3
Company: Hong Kong Observatory
Job Title: Student Intern

The work-study program has broadened my horizons. My role at the Hong Kong Observatory involved running a school-based program to educate the public about the dangers of ionizing radiation and how to reduce its impact during disasters. The main objective was to increase public awareness by providing workshops for secondary school students. I was also tasked with designing a device to measure dose rate, temperature, pressure, and humidity. This included checking its functionality and appearance, as well as its hardware, software, and data handling. These processes allowed me to demonstrate that what I learned in my lessons was not just theoretical.

CHAN Ho Ting
Major: B.Eng. in MAEG
Study Year: Year 3
Company: The Hongkong Electric Company Limited
Job Title: Vacation Trainee

During my time as a Vacation Trainee (VT) in the TND/C&M/EC Department at the HK Electric, I was immersed in a world of cable testing, dissecting damaged cables, organizing detailed cable data, and maintaining equipment. This hands-on experience not only broadened my technical skills but also offered me a glimpse into the intricate workings of an engineering-focused company.

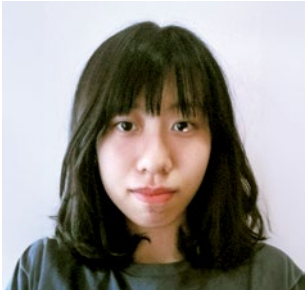
Reflecting on this VT programme, I found immense joy in the experiences it provided. From engaging in site work to forming new relationships, every moment was rewarding. This internship has been instrumental in shaping my future career aspirations, emphasizing the importance of a clear career plan and highlighting the value of each department within an organization. I have come to appreciate the significance of mechanical engineering and the collective importance of every department. I am grateful to everyone at the HK Electric, especially those in EC Department, for their kindness, mentorship, and for making my time there not only educational but also enjoyable.

LAU Pak Him
Major: B.Eng. in MAEG
Study Year: Year 3
Company: Electrical and Mechanical Services Department, HKSAR Government
Job Title: Summer Intern

I had the chance to work on actual engineering projects during my internship, which provided me with valuable insights. Studying various documents related to the standards and specifications governing different car models prepared me to participate in the on-site inspection of the Ping Chau Fire Station. My team and I carefully evaluated whether the ambulances adhered to the specifications listed in the tender documents and met specific standards. We also spoke with users and gathered their feedback to identify potential improvements.

In addition, I gained practical experience with 3D printing and computer-aided design (CAD) sketching. These skills have helped me bridge the gap between academic knowledge and real-world application by enabling me to effectively visualise and construct prototypes. This experience has improved my technical skills and provided me with a thorough understanding of the engineering sector, allowing me to take advantage of future professional opportunities and challenges.

Finally, by creating simulations of tow trucks to help clients visualise and understand our projects, I had the opportunity to enhance my coding skills. Additionally, I trained large language models (LLMs) to assist with routine documentation tasks, which streamlined our workflow and increased productivity. This internship has significantly improved my technical proficiency and equipped me to face any challenges that may arise in the engineering industry in the future.



TSE Pui Tung
Major: B.Eng. in EEEN
Study Year: Year 2
Company: Electrical and Mechanical Services Department, HKSAR Government
Job Title: Summer Intern

I worked as a summer intern in the Energy Efficiency Office, which is related to my field of study. Although the internship lasted only two months, it has broadened my horizons and guided my future career path.

I gained specialized experience that I might not be able to acquire at private companies, particularly in regulatory services. By assisting with the Energy Audit Project, I learned the metrics used to assess a building's energy usage. Participating in the process of bidding proposals allowed me to understand the procedures involved in government engineering projects.

In addition to the tasks mentioned above, the informative talks I attended were highly educational. Discussions on new LED lighting innovations, BIM techniques, and other topics introduced me to a diverse range of tasks and opportunities.

I am grateful for the opportunity to participate in this internship, and I would highly recommend it to students seeking to strengthen their operational capabilities.

ASTAWA Leonhard Audie
Major: B.Eng. in EEEN
Study Year: Year 4
Company: MTR Corporation Limited
Job Title: Summer Intern

I joined the summer internship programme at MTR. I had the opportunity to work on a variety of projects that bridged the gap between my engineering background and the field of quality management. These projects allowed me to apply my technical knowledge and skills in a corporate setting while contributing to the overall quality and compliance objectives of the organization. One significant project I was involved in was the development and implementation of a standardized quality management system across multiple departments within the company. Drawing upon my engineering background, I was able to contribute to the design and optimization of processes, ensuring they aligned with industry standards and regulatory requirements.

The internship has not only enhanced my technical skills but has also improved my communication, teamwork, and problem-solving abilities. Overall, the practical experience gained during the internship has been instrumental in shaping my professional development and has given me the confidence to embark on my future career path.

CHAN San Yu
Major: B.Eng. in EEEN
Study Year: Year 4
Company: CLP Holdings Limited
Job Title: Summer Intern

In the era of digitalization, data has become a crucial element of life, and the electricity used in data centres has become increasingly prominent. During my three months working in the Data Centre Sales team, I was fortunate enough to innovate, inspire, and make an impact on the engineering of data centre sustainability.

It was a great opportunity to work with the Policy Research Centre for Innovation and Technology at The Hong Kong Polytechnic University to research innovative energy audit solutions for Equinix, while developing sustainable practices for data centres. After identifying practical problems, we applied our knowledge of mechanical engineering to advise on energy-efficient cooling systems for data centres, inspiring the development of better cooling infrastructures.

I truly appreciate the opportunity the team provided to explore data centre development in Hong Kong.

STATISTICS

GRANTS

Faculty members of the MAE Department successfully secured over HK$155 million in grant funding between 2021 and 2024. These grants, awarded during this period, include funding from the Research Grants Council (RGC) and the Innovation and Technology Fund (ITF) of the Innovation and Technology Commission of the HKSAR Government.

RGC GRANTS (GENERAL RESEARCH FUND AND EARLY CAREER SCHEME)

Principal Investigator	Project Title
Prof. CHEN Ben M.	Advanced Motion Planning Techniques for the Cooperation of Multi-agent Systems
Prof. CHEN Ben M.	Collaborative Search and Pursuit-evasion for Unmanned Systems in Cluttered Environments
Prof. CHEN Ben M.	Collaborative Task Assignment of Multi-agent Unmanned Systems for Infrastructure Inspection
Prof. CHEN Chun	Development of Metal-organic Framework-embedded Nanofiber Air Filters with Enhanced Particle Removal Efficiency and Their Applications in Indoor Particle Control
Prof. CHEN Fei	TELE-LEARN: Human Tele-demonstration Based on Manipulation Skills Learning for Collaborative Dual-arm Mobile Robots
Prof. CHEN Fei	Learning and Control of Adaptive Co-manipulation in Human-robot Collaboration Based on Cognitive Ergonomics
Prof. CHEN Fei	Learning, Modelling and Control of Real-world Humanoid Robot-robot Collaboration Based on Human-human Collaboration Demonstration
Prof. CHEN Shih-Chi	Development and Mechanistic Study of Multi-focus Two-photon Lithography Based on Dual-comb Spectroscopy
Prof. CHENG Shing Shin	Leveraging Hybrid Mechanisms under Optimized Structural and Motion Frameworks for MRI-guided Robotic Intracerebral Hemorrhage Aspiration
Prof. CHENG Shing Shin	Submillimeter Magnetic Soft Robotic Cannula with Stiffness Enhancement, Contact Sensing and Stochastic Optimal Control for Deep Brain Intervention
Prof. HUANG Jie	An Integrated Approach to the Cooperative Control of Complex Multi-agent Systems
Prof. LAU Darwin Tat Ming	Design and Control of Hybrid Spatial and Hyper-redundant Cable-driven Parallel Robots
Prof. LAU Darwin Tat Ming	Design and Control of Deforming Flexible and Tensegrity Cable-driven Parallel Robots
Prof. LAU Darwin Tat Ming	Cable-driven Supernumerary Robotic Limbs with Foot Control for Intuitive Human-robot Collaboration
Prof. LIAO Wei-Hsin	Nonlinear Piezoelectric Energy Harvesters with Hierarchical Auxetic Metastructures
Prof. LIAO Wei-Hsin	In-process Metrology Development to Investigate Defect Formation in the Laser Cladding Direct Energy Deposition Manufacturing Process
Prof. LIU Yun-Hui	Development of an Image-guided Intravitreal Injection Robot
Prof. LU Yi-Chun	Degradation Mechanisms and Mitigation Strategies of Deposition-dissolution based Zn-Mn2+/MnO2 Aqueous Batteries
Prof. LU Yi-Chun	Model System Investigations of Polyoxometalate Electrolyte for Low-temperature Redox Flow Batteries Applications
Prof. LU Yi-Chun	Developing Low-cost Symmetric Chromium-bromine Aqueous Redox Flow Batteries: Electrode/Electrolyte Designs Enabled by Ynergistic Chromium-bromide Interactions

Principal Investigator	Project Title
Prof. MA Xin	Magnetically Driven Robot Equipped with Flexible Manipulators and Soft Anchors for Endoluminal Surgery in the Depth of the Colon
Prof. REN Wei	Cavity-enhanced Photoacoustic Raman Spectroscopy for Trace Gas Sensing with Continuous-wave Semiconductor Lasers
Prof. SONG Xu	3D Hierarchical Shell-based Lattice Structures with Highly Tunable Mechanical Properties: Implicit Design and High-precision Additive Manufacturing
Prof. WONG Hay	In-situ Process Monitoring with Laser Diode Scanning Imaging for the Laser Powder Bed Fusion Process
Prof. YUAN Haidong	Incompatibility Measures for Multi-parameter Quantum Estimation under General p-local Measurement
Prof. YUAN Haidong	Quantum Metrology with Indefinite Causal Orders and the Implementations on Spin System
Prof. ZHANG Li	Investigation of Heterogeneous Colloidal Microswarm with Hierarchical and Cooperative Functionalities in Biofluids
Prof. ZHANG Li	Investigating the Optimized Pattern Transformation Rate of Magnetic Colloidal Microswarm for Rapid Active Delivery in Confined Space
Prof. ZHANG Li	Probing the Dynamic Interactions Between Microrobot Swarms and Curved Boundaries in a Tiny Lumen
Prof. ZHANG Weizhao	Investigating and Predicting Preforming Effects on Resin Solidification of Woven Carbon Fiber Reinforced Plastics (CFRPs) Using Multiscale Modeling and Experiments
Prof. ZHANG Weizhao	Multiscale Modeling for Out-of-plane Behaviors of Carbon Fiber Reinforced Polymers (CFRPs) during Thermoforming
Prof. ZHANG Weizhao	The Mechanism Study and Material Engineering of Triboelectric Surface Charge
Prof. ZHOU Jianshu	In-hand Granular Object Manipulation Using a Dexterous Soft Hand Based on Learning and Tactile Sensing

ITF GRANTS

Principal Investigator	Project Title
Prof. CHEN Shih-Chi	High-throughput Fabrication Platforms for Submicron Scale Optical Components and Photonic Devices
Prof. CHEN Shih-Chi	Next Generation High-density 3D Optical Storage Platform based on Ultrafast Lasers
Prof. CHENG Shing Shin	Development of a Novel Gastric Simulator for Endoscopic Skill Training and Evaluation
Prof. CHENG Shing Shin	A Flexible Endoscope for the Robot-assisted Bimanual Functional Endoscopic Sinus Surgery
Prof. CHENG Shing Shin	A Robotic Needle System with Integrated Tracking for Endoscopic Ultrasound-guided Fine Needle Biopsy
Prof. CHENG Shing Shin	Video Analysis for Automated Surgical Skill Assessment in Cataract Surgery
Prof. CHENG Shing Shin	A Robotic Needle Driver with Dedicated Navigation Frame for MRI-guided Brain Lesion Biopsy
Prof. CHENG Shing Shin	A Flexible Robotic High-definition Endoscope for Sinus Surgery
Prof. LAU Darwin Tat Ming	Robotics, STEM and Green Innovation (Phase 3)
Prof. LIAO Wei-Hsin	Embedded Generators for Self-powered Smart Watches and Wristbands
Prof. LIAO Wei-Hsin	Wearable Health Monitoring and Dynamic Gait Analysis of Neurodegenerative Parkinson's Disease
Prof. LU Yi-Chun	Developing Low-cost and Efficient Electrospinning Processes for Flexible Li-ion Batteries
Prof. LU Yi-Chun	Trial: A Safe, Scalable and Low-cost Flow Battery System for Smart City and Micro-grid Application
Prof. REN Wei	Ammonia-nitrogen Coordinated Control System for Flue Gas Denitration Based on NH3/NOx Distributed Online Monitoring
Prof. REN Wei	Exhaled Breath Analysis for Lung Cancer Using Mid-infrared Laser Spectroscopy
Prof. REN Wei	A Mobile Mid-infrared Laser Analyzer for Fast and In-situ Tobacco Detection
Prof. SONG Xu	Breathable Lightweight Hip Protectors for Elderly in Nursing Homes
Prof. XU Yunjian	Data-driven and Deep Learning Based Smart HVAC Control System for Energy Saving and Thermal Comfort Enhancement
Prof. YAM Yeung	Stereo Structured Light by Dual Bi-directional Channel 3D for Endoscopic Scanner System
Prof. ZHANG Weizhao	Optimization for Preforming of Carbon Fiber Reinforced Plastic (CFRP) Parts based on Numerical Modeling

SCHOLARSHIPS

From the academic years 2021-2022 to 2023-2024, 221 scholarships totalling over HK$8.5 million were awarded to students of the MAE Department. These scholarships were provided by the HKSAR Government, industrial sponsors, and the University.

The following tables show the scholarships granted by the HKSAR Government and industrial sponsors.

HK GOVERNMENT (2021-2024)

Student Name	Programme	Scholarship Name	Year
SAUNG Hnin Phyu	UG, EEEN	Belt & Road Scholarship	2021-22
VINCENT	UG, MAEG	Belt & Road Scholarship	2021-22
BOIKO Aleksandra	UG, MAEG	Belt & Road Scholarship	2022-23
SAUNG Hnin Phyu	UG, EEEN	Belt & Road Scholarship	2022-23
VINCENT	UG, MAEG	Belt & Road Scholarship	2022-23

INDUSTRIAL SPONSORS (2021-2024)

Student Name	Programme	Scholarship Name	Year
CHAN San Yu	UG, EEEN	CLP Scholarship	2021-22
TO Pak Kiu Katy	UG, MAEG	CLP Scholarship	2021-22
WANG Wenhao	UG, MAEG	Dahua Education Scholarships	2021-22
GARG Shiven	UG, MAEG	HongKong Marker Association Scholarship	2021-22
HEIBA Serageldin Amre Abdelaziz	UG, EEEN	NTK Scholarship	2021-22
KOO Kin Yee	UG, EEEN	Polywell Scholarships	2021-22
LEE Cheuk Yin	UG, EEEN	Polywell Scholarships	2021-22
LEE Taehun	UG, MAEG	Pro-Technic Scholarships	2021-22
WANG Yujiao	UG, EEEN	Pro-Technic Scholarships	2021-22
NG Hui Yin	UG, MAEG	VTech Innovation and Sustainability Award: Champion	2021-22
HO Ka Chun	UG, EEEN	VTech Innovation and Sustainability Award: 1st Runner-up	2021-22
HON Wing Ngai	UG, EEEN	VTech Innovation and Sustainability Award: 2nd Runner-up	2021-22
CHU Wai Ying	UG, EEEN	VTech Innovation and Sustainability Award: Honorable Mention	2021-22
YIM Ming Yeung Arthur	UG, MAEG	VTech Innovation and Sustainability Award: Honorable Mention	2021-22
JEON Min Gyu	UG, EEEN	CLP Scholarship	2022-23
TSEN Hin Yeung	UG, MAEG	CLP Scholarship	2022-23
CHIU Ting Kok	UG, MAEG	Hongkong Zhuhai Commerce Association Scholarship	2022-23
CHEUNG King Ho	UG, EEEN	VTech Innovation and Sustainability Award: Champion	2022-23

Student Name	Programme	Scholarship Name	Year
CHEN Zhenxi	UG, EEEN	VTech Innovation and Sustainability Award: 1st Runner-up	2022-23
LEE Man Lai	UG, EEEN	VTech Innovation and Sustainability Award: 2nd Runner-up	2022-23
BHATTACHARJYA Eshanee	UG, EEEN	VTech Innovation and Sustainability Award: Honorable Mention	2022-23
KOO Kin Yee	UG, EEEN	VTech Innovation and Sustainability Award: Honorable Mention	2022-23
LYU Dingyi	UG, MAEG	Hongkong Zhuhai Commerce Association Scholarship	2022-23
KADIR Sattar	UG, MAEG	Polywell Scholarships	2022-23
WIDJAJA Oliver	UG, MAEG	Polywell Scholarships	2022-23
TO Pak Kiu Katy	UG, MAEG	Pro-Technic Scholarships	2022-23
TO Pak Kiu Katy	UG, MAEG	VTech Group of Companies Scholarship	2022-23
KADIR Sattar	UG, MAEG	Dahua Education Scholarship	2023-24
LYU Dingyi	UG, MAEG	HongKong Maker Association Scholarship	2023-24
WIDJAJA Oliver	UG, MAEG	Hongkong Zhuhai Commerce Association Scholarship	2023-24
YADAV Nishchaya	UG, MAEG	Hongkong Zhuhai Commerce Association Scholarship	2023-24
CHIU Ting Kok	UG, MAEG	Polywell Scholarships	2023-24
DO Huy Duc	UG, MAEG	Polywell Scholarships	2023-24
LEUNG King Ho	UG, MAEG	Pro-Technic Scholarships	2023-24
TAM Cheuk Yee	UG, MAEG	Pro-Technic Scholarships	2023-24
KADIR Sattar	UG, MAEG	VTech Group of Companies Scholarship	2023-24
CHAN Hoi Fung Ronaldo	UG, EEEN	VTech Innovation and Sustainability Award: Champion	2023-24
SUYANTO Pamela Wylona	UG, EEEN	VTech Innovation and Sustainability Award: 1st Runner-up	2023-24
CHEUNG Cheuk Him	UG, MAEG	VTech Innovation and Sustainability Award: 2nd Runner-up	2023-24
AU Ming Piu	UG, MAEG	VTech Innovation and Sustainability Award: Honorable Mention	2023-24
HUI Pak Kei	UG, EEEN	VTech Innovation and Sustainability Award: Honorable Mention	2023-24

ADVISORY COMMITTEE & SCHOLARSHIP DONORS

ADVISORY COMMITTEE (2021-2024)

CHAIRMAN

Ir. Hon. CHAN Siu Hung, JP	Senior Advisor, CLP Holdings Limited

MEMBERS

Ir. CHANG Che Son	Chairman and Director, Key Direction Limited
Ms. CHIANG Maria L. L.	Managing Director, Chen Chien Holdings Limited
Mr. IP Simon P. S.	Director, NTK Holdings Limited
Mr. LAI Robert K. T.	Managing Director, Pro-Technic Machinery Limited
Ir. Prof. LAM Alan Hiu Fung, JP	Founder and Chairman, Sengital Group Limited
Ir. Dr. LEE Barry C. H.	Chief Executive Officer, Associated Engineers, Limited
Dr. LEUNG Raymond S. H.	Chairman, FiMax Technology Ltd Chairman & CEO, Altai Technologies Limited
Mr. WONG Yam Mo	Chief Technical Officer, ASM Pacific Technology Limited
Prof. XIE Lihua	Professor, School of Electrical and Electronic Engineering, Nanyang Technological University
Mr. LIU Chi Hung Kelvin (till 31 Jul 2022)	General Manager (Metal Business Unit), CN Innovations Limited

EX-OFFICIO MEMBERS

Prof. CHEN Ben M.	Chairman (from 2024-25) Department of Mechanical and Automation Engineering, CUHK
Prof. LIAO Wei-Hsin	Chairman (till 2023-24) Department of Mechanical and Automation Engineering, CUHK
Prof. LU Yi-Chun	MSc Programme Director Department of Mechanical and Automation Engineering, CUHK
Prof. TSANG Hon Ki	Dean (from 2023-24) Faculty of Engineering, CUHK
Prof. WONG Martin D. F.	Dean (till 2022-23) Faculty of Engineering, CUHK

SECRETARY

Prof. AU Kwok Wai Samuel	Chairman, Industrial Relationship Committee Department of Mechanical and Automation Engineering, CUHK

SCHOLARSHIP DONOR COMPANIES (2021-2024)

CLP Power Hong Kong Limited	NTK Holdings Limited
Dahua Education	Polywell Machinery Limited
Hongkong Marker Association Limited	Pro-Technic Machinery Limited
Hongkong Zhuhai Commerce Association	

FACTS & FIGURES

(1 JULY 2021 – 30 JUNE 2024)

GRANTS IN TOTAL:
OVER HK$155 MILLION

NO. OF GRANTS:
OVER 75

NO. OF HONOURS AND AWARDS:
OVER 200

NO. OF FACULTY MEMBERS*:
37

NO. OF SCHOLARSHIPS:
OVER 220

SCHOLARSHIPS IN TOTAL:
OVER HK$8 MILLION

NO. OF PUBLICATIONS:
OVER 800

* as of September 2024
* excluding Professors (by courtesy) and Adjunct Professors/ Adjunct Associate Professors/ Adjunct Assistant Professors

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