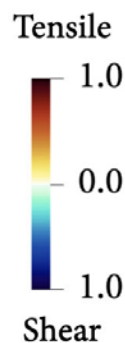


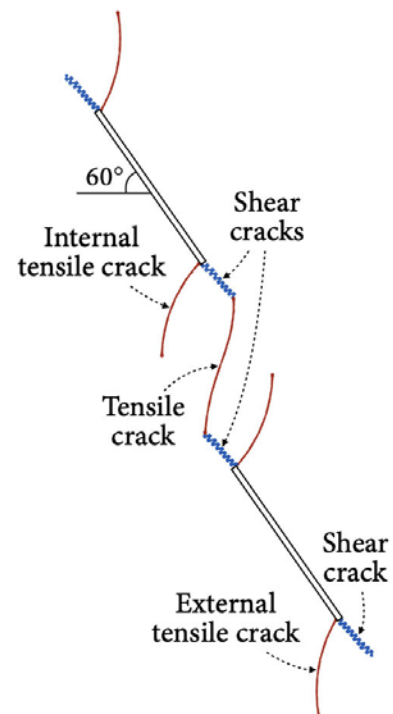
## Digital twinning of rock fracturing

Simulation of mixed-mode fracturing in rocks remains one of the most challenging problems in computational mechanics, despite its critical importance for many problems related to infrastructure resilience, energy resources, and environmental sustainability. Recently, HKU researchers have developed a new approach – called the double-phase-field method – which can accurately simulate and distinguish between tensile and shear fractures without any algorithm for tracking crack geometry. (See the full video from <https://youtu.be/zQRoCSFsVw>)



### Experiment

[Bobet & Einstein 1998]



**Double-phase-field formulation for mixed-mode fracture in rocks**

F. Fei and J. Choo, *Comput. Methods Appl. Mech. Engrg.* 376 (2021) 113655

## Departmental Events

### MiC Booklets Launch “MiC Success, Glossary and Guidebook” at The University of Hong Kong (HKU) on December 29, 2020

The Centre for Innovation in Construction and Infrastructure Development (CICID) of Department of Civil Engineering of HKU produced three Modular Integrated Construction (MiC) booklets which were launched at HKU on December 29, 2020. The three booklets are entitled “Modular Integrated Construction for High-rises: Measured Success”, “A Glossary of Modular Integrated Construction”, and “Modular Integrated Construction Performance Measurement Guidebook”.



Launching ceremony of MiC Booklets.

Officiating at the launching ceremony, Ir Lam Sai-hung, JP, Permanent Secretary for Development (Works) again pointed out Government’s policy to support MiC. He said, “Hong Kong’s construction industry is facing severe challenges due to declining productivity and ageing workforce. Projects adopting MiC show definite benefits over conventional construction methods. Through the concerted effort of the Government, industry and academia, MiC will contribute to modernizing Hong Kong’s construction industry.”



“We are more than delighted to launch the three MiC booklets. These publications not only contribute clarity and new understanding of MiC in Hong Kong, but also provide useful guidance for the industry and enterprises to adopt and measure the new technology,” Professor Christopher Chao, Dean of Faculty of Engineering of HKU said at the ceremony.

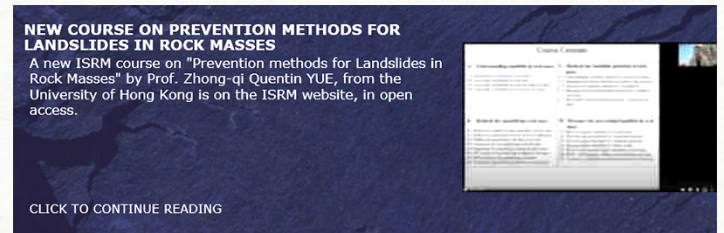


Ir Professor W. Pan, Executive Director of HKU CICID and lead author of the three publications said “The aim of the MiC booklets is to support Government’s policy on MiC and to bring clarity and understanding of the new technology to Hong Kong’s construction industry. They will provide comprehensive benchmarking of social, environmental and economic performance of adopting MiC to high-rise building projects in Hong Kong.”



### ISRM Video Online Course entitled “Prevention Methods for Landslides in Rock Masses”

Invited by Professor Resat Ulusay, the President of the International Society for Rock Mechanics and Rock Engineering (ISRM), Professor Z.Q. Yue delivered an ISRM Video Online Course entitled “Prevention Methods for Landslides in Rock Masses”. This open-access educational course is an initiative of ISRM against COVID-19 pandemic in 2020.



The four objectives of the course include to understand and assess landslide, to understand and describe rock mass in ground, to understand and quantify landslide potential of rock mass, and to design and construct measure preventing landslide in rock mass. Hence, the course has four parts with 24 lectures.

**Part A** is “Understanding landslide in rock mass” and has four lectures covering (A1) Introduction of landslide in rock mass, (A2) Case study of landslide in rock mass, (A3) Case study of landslide in rock mass due to water, and (A4) Case study of landslide in rock mass due to gas.

**Part B** is “Methods for quantifying rock mass” and has eight lectures covering (B1) Method for quantifying discontinuities of rock mass, (B2) Method for quantifying degrees of rock weathering, (B3) Drilling for quantifying rock mass in ground, (B4) Laboratory test for quantifying rock strength, (B5) Penetration for quantifying weathered rock mass, (B6) SPT monitor for quantifying weathered rock mass, (B7) DPM technique for quantifying rock mass, and (B8) Method for quantifying groundwater in rock mass.

**Part C** is “Methods for landslide potential of rock mass” and has five lectures covering (C1) Understanding landslide potential of vertical rock mass, (C2) Mechanical model for landslide potential by discontinuity, (C3) Stereonet for landslide potential by discontinuity, (C4) Mechanical model for landslide potential by weathered rock mass, and (C5) Slice method for landslide potential by weathered rock mass.

**Part D** is “Measures for preventing landslide in rock mass” and has seven lectures covering (D1) Measures against landslide by discontinuity, (D2) Measures against landslide by weathered rock mass, (D3) Soil nail against landslide by weathered rock mass, (D4) Drainage against landslide by surface water, (D5) Observational method against landslide in rock mass, (D6) DPM + DTH hammer drilling for quantifying rock mass, and (D7) Case study of landslide prevention measures in rock mass.

The total lecturing hours of this course is 28.5 and its details are presented at ISRM websites <https://www.isrm.net/noticias/detalhes.php?id=533> and <https://www.isrm.net/gca/?id=1525>.

## Staff Awards/Activities/News

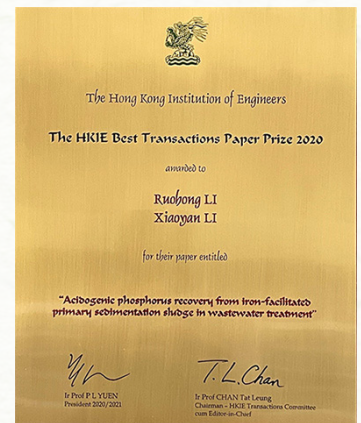
### Staff Awards

**Dr. M.M. Hu** recently won the Best Paper Award (Oral) for her presentation entitled “Chemo-mechanical models for acidizing assisted hydro-fracturing” at the 2nd International Conference on Coupled Processes in Fractured Geological Media: Observation, Modeling, and Application (COUFRAC2020), held online and in Seoul, November 11-13, 2020. Dr. Hu’s research group has been focusing on tackling the fundamental Multi-scale Multiphysics problems of environmentally assisted cracking that is essential in a wide context of geoenvironmental circumstances concerning clean energy and adaptation to Climate Change, including enhanced geothermal systems (EGS), Carbon Capture Utilisation and Storage (CCUS), unconventional resources recovery, sediment laboratory aging, geochemical inception of land motion, effect of ocean acidification, emerging geomaterials for sustainability and resilience, etc.



**Dr. R.H. Li** and **Professor X.Y. Li** were awarded the HKIE Best Transactions Paper Prize 2020 for their paper published in HKIE Transactions Volume 26 No. 2 titled “Acidogenic phosphorus recovery from iron-facilitated primary sedimentation sludge in wastewater treatment”. Dr. R.H. Li is a Ph.D. graduate from the Department and Professor

X.Y. Li is his supervisor. Their paper was published in the Theme Issue of HKIE Transactions on Sustainable Wastewater Technologies for Pollution Control and Resource Recovery in 2019. The paper presented their experimental study on the integration of the chemical phosphorous removal (CPR) process and acidogenic phosphorous recovery (APR) for enhanced phosphorous (P) removal and recovery in wastewater treatment. The CPR-APR system utilises iron-based CPR to achieve a high P removal and then acidogenic fermentation to extract P from the Fe-sludge for P recovery as a valuable fertiliser resource. The new technology has advantages such as high recovery efficiency, easy operation and little secondary pollution for effective P recovery from wastewater and sludge. The prizes include a cash award and 2 wooden plaques.



### Professor W. Pan

*Professor W. Pan Awarded 2020 Honours List and Chief Executive’s Commendation for Community Service*

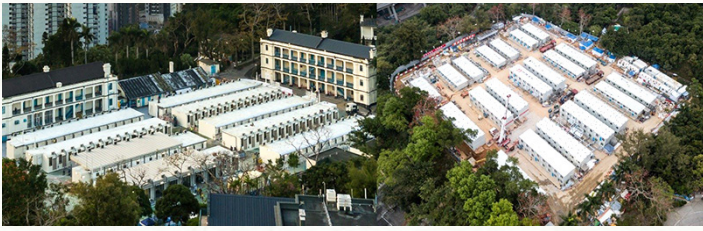
Professor W. Pan was honoured in the 2020 Honours List of the HKSAR Government. Professor Pan received the Chief Executive’s Commendation for Community Service for his outstanding contribution in the fight against COVID-19, at the 2020 Honours and Awards Presentation Ceremony held at the Government House on November 15, 2020.



(Left: Mrs. Carrie Lam, Chief Executive of the HKSAR; Right: Professor W. Pan).

*HKU CICID awarded “Brunel Medal – Highly Commended, 2020” by the Institution of Civil Engineers (ICE)*

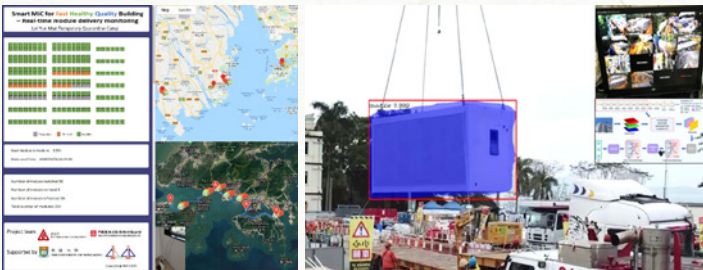
In response to the outbreak of COVID-19 and the fast development of this pandemic, the HKSAR Government decided in late January 2020 to build new quarantine camps to meet the extremely urgent need for quarantine. The first such project delivered in Hong Kong is the Lei Yue Mun Quarantine Camp (LYMQC).



Lei Yue Mun Quarantine Camp (LYMQC). Courtesy China State Construction (Hong Kong) Limited.

The target for the Architectural Services Department (ArchSD) of the HKSAR Government, the project client was to deliver the Camp with high quality and speed. The ArchSD, together with the main contractor China State Construction (Hong Kong) Limited and in collaboration with the Centre for Innovation in Construction and Infrastructure Development (CICID) of Department of Civil Engineering at The University of Hong Kong (HKU), completed the quarantine camp in two stages -- the first batch of 118 units in 25 days and the remaining 234 units in 60 days.

HKU CICID as Academic Collaborator of the project team set up a cloud-based web-portal for real-time logistics monitoring of module transportation and installation. CICID also developed an AI-based and computer vision which enabled module detection algorithm for module lifting cycle time estimation and module installation progress prediction. This technique employed an unmanned aerial vehicle for taking aerial photos for site progress and safety monitoring.



Smart technologies adopted in the LYMQC project.

In recognition of the highly commendable effort on this project, HKU CICID together with the LYMQC project team has been awarded the "Brunel Medal – Highly Commended, 2020" Award by the Institution of Civil Engineers (ICE) in October 2020. Professor W. Pan, Executive Director of the CICID led the research team to take this project from inception to completion utilizing modular integrated construction (MiC) and smart construction technology.



From left: Professor Sam Chan, Professor C.K. Mak and Professor W. Pan.

Professor W. Pan commented, "The use of MiC technology in this quarantine project provided an exemplar to showcase the fast and quality project delivery which encompassed project planning, design, module production and installation. This project will serve to demonstrate the feasibility of a new mode of project delivery using smart construction technologies."



CICID research team on the LYMQC project.

Professor C.K. Mak, Vice-Chairman of the CICID remarked, "The use of MiC for the LYM quarantine camp aptly demonstrates the importance and timeliness of smart construction technology in Hong Kong. CICID is delighted to be able to contribute to the Hong Kong construction industry and the community in fighting COVID-19."

### Professor C.Y. Tang

Professor C.Y. Tang received the **2020-2021 RGC Senior Research Fellow Award**. He is among the ten awardees in this inaugural round of the prestigious fellowship. The RGC Senior Research Fellow Scheme (SRFS) provides sustained support and relief from teaching and administrative duties to exceptionally outstanding researchers at UGC-funded universities in Hong Kong, with a view to facilitating their full dedication to research and development and helping universities attract and retain research talent. Under the fellowship, Professor Tang receives a grant of HK\$7.8 million to conduct cutting-edge research in membrane technology.



Professor Tang is recognized as a world leader in membrane technology, desalination, and water reuse. He has made critical contributions to the better understanding of the nanoscale structures of desalination membranes and their transport behaviors. He is the lead inventor of aquaporin-based biomimetic membranes. For the first time, he demonstrated a scalable biomimetic desalination membrane that incorporates aquaporins (water channel proteins) for

highly efficient water transport while maintaining excellent selectivity. This new-generation membrane technology, widely recognized in the desalination field, that has been commercialized in Singapore, Denmark, and China. Professor Tang developed the pioneer work on interfacial nanofoaming for controlling the surface roughness and morphology of polyamide reverse osmosis membranes. For the first time, he elucidated the fundamental mechanism of interfacial degassing that shapes the surface roughness features, thus solving the 40-year puzzle for membrane researchers. His nanofoaming method is highly effective to overcome the longstanding permeability-selectivity tradeoff of reverse osmosis and nanofiltration membranes. His work on designing membranes to directly target micropollutant removal bridges a critical literature gap between membrane synthesis and water reuse applications and has been featured in Chemical Engineering News as an agenda-setting work for the future development of membranes for water reuse.

Professor C.Y. Tang received the inaugural **HKU Innovator Award** in recognition of his distinguished achievements in the development of novel filters and membranes. The new HKU Innovator Award has been established to recognize “outstanding Faculty members whose innovations demonstrate exceptionally high potential impact (legacy or projected legacy) with transformative results to foster development”. The novel water filters and air filters developed by Professor Tang’s team has been recognized by numerous awards in recent years. The rapid water filter technology receives a Gold Medal at the 47th International Exhibition of Inventions Geneva (2019), the MIT Technology Review’s Innovators Under 35 Asia Pacific (2019), and the HKIE Outstanding Paper Award for Young Engineers/Researchers (2020). The reusable air filter technology receives a Gold Award, the Top 20 Best Invention Award, and the Special Award by Toronto International Society of Innovation & Advanced Skills at the 5th International Invention Innovation Competition in Canada (2020).

Professor C.Y. Tang received the **VEBLEO Fellow Award** in honour of his career achievement in membrane technology. The award recognizes researcher “who has prominence and leadership in the field of science, engineering, and technology”.

**Professor Z.Q. Yue** received the **2020 China Simulation-Based Engineering and Science Award** in the category of the Outstanding Contribution Award. The award was issued by Chinese Alliance for Simulation-Based Engineering and Science (CASES) in October 2020 <http://www.szfzlm.com/news/173.html>. CASES



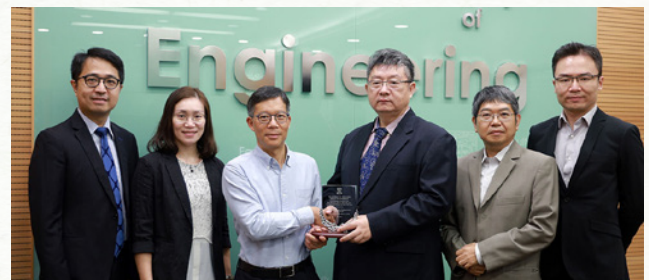
is associated with Chinese Society of Theoretical and Applied Mechanics, Chinese Mechanical Engineering Society, and China Computer Federation.

The geotechnical research team including Professor Z.Q. Yue, Professor C.F. Lee, Professor K.W. Law and Professor L.G. Tham carried out the research project entitled “Digital drilling process monitoring technique and theoretical method for in-situ testing of soil and rock mechanical properties”. This project has won the **first class award of Science and Technology Award of the 11th China Society for Rock Mechanics and Engineering** in the category of Natural Science in October 2020.



**Faculty Outstanding Teaching Team Award**

Professor Z.Q. Yue, Dr. K.L. Su, Dr. K.H. Law, Dr. C.P. Wong and Dr. A.S.H. Lau received the Faculty Outstanding Teaching Award (Team Award) 2019-2020 for their collaborative effort and achievement of Project Mingde in the past years. The award re-presentation was held on October 14, 2020 in the Faculty Conference Room.



Group photo of Project Mingde Teaching Team.

**Staff Activities**

**Professor W. Pan**

- presented a paper entitled “A Novel Methodological Framework of Smart Project Delivery of Modular Integrated Construction” co-authored with his research team Dr. Mi Pan and Mr. Zhenjie Zheng at the 37th International Symposium on Automation and Robotics in Construction (ISARC) organised online October 27-28, 2020.

- delivered an invited Speech entitled “Net Zero: Why What How” at the Eco Asia Advancing Net Zero Conference 2020 organized by the Hong Kong Trade Development Council and Hong Kong Green Building Council on November 20, 2020.



- delivered an invited speech entitled “Concrete MiC for High-rises Measured Performance and Way Forward” at the site visit by the Housing Authority Building Committee to the Disciplined Services Quarters for the Fire Services Department at Pak Shing Kok in Tseung Kwan O, which was organized by the Development Bureau of the HKSAR Government on January 18, 2021.



- coordinated and organized a delegation with members from the Development Bureau of the HKSAR Government and the CICID to visit the North Lantau Hospital Hong Kong Infection Control Centre which was built using MiC on January 13, 2021. During the visit, Professor Pan briefed the temporary hospital project team on the MiC research conducted by the CICID and presented a set of the three MiC booklets, i.e. MiC Glossary, Guidebook and Success to the project team for sharing.



From Left: Ir John Kwong of Development Bureau, Mr. Yi Zhang of China State Construction, and Professor W. Pan.

**Professor C.Y. Tang**

- delivered an online Keynote Talk on “Recent developments and environmental applications of interlayered thin film nanocomposite membranes” at the International Summit of the Chinese Academy of Engineering on Ecological Security and Green Development for Guangdong-Hong Kong-Macao Greater Bay Area (ISCAE-GBA), December 17-19, 2020.
- delivered an online Keynote Talk on “New insights into the roughness of polyamide reverse osmosis membranes” at the International Congress on Membranes and Membrane Processes, December 7-11, 2020.

- delivered an online Keynote Talk (VEBLEO Fellow Lecture) on “Nano-enhanced membranes for desalination and water reuse” at the Webinar on Materials Science, Engineering and Technology, October 17-20, 2020.

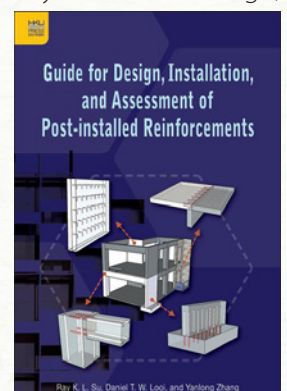
**Professor J. Yang** was invited by Hong Kong Society of Theoretical and Applied Mechanics (HKSTAM) to deliver a HKSTAM distinguished lecture on September 15, 2020. His lecture entitled “Towards a novel method for liquefaction evaluation of granular soils” was well received by more than 150 participants.

**Staff News**

**Professor W. Pan**

- was promoted to Professor with effect from September 1, 2020.
- was re-appointed Executive Director of Centre for Innovation in Construction and Infrastructure Development (CICID) for a period till December 31, 2022.
- was re-appointed Member of the Technical Committee for the Code of Practice for Precast Concrete Construction, Buildings Department, HKSAR Government for a period till December 31, 2023.
- was re-appointed Chairman of the Construction Workers Registration Board (CWRB) Data Analysis Sub-committee for a period till June 30, 2022.
- was re-appointed Member of the MiC Vetting Sub-committee on Construction Innovation and Technology Fund for a period till August 31, 2022.
- was appointed Advisor of the Hong Kong Green Building Council Sustainable Development Committee for a period till December 31, 2021.
- was appointed Vice-Chairman of the Organising Committee of Advancing Net Zero International Conference.
- was appointed Member of the Technical Committee of Advancing Net Zero Ideas Competition.

**Dr. R.K.L. Su** published a book, namely “Guide for Design, Installation, and Assessment of Post-installed Reinforcements”. The guide book sets out the installation, design, and assessment guidelines for post-installed reinforcements and fills a much-needed gap in the literature. The technology of post-installed reinforcement is growing increasingly important since reinforcing bars are being used frequently in horizontal,



vertical, and overhead applications on the rehabilitation and strengthening of existing structures. Post-installed reinforcements are also used in specific situations in new construction to simplify construction procedures and provide flexibility in design and construction.

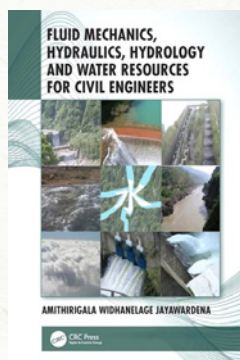
Use discount code A-G4DSN to save 20% on this book valid through September 30, 2021. <https://hkupress.hku.hk/pro/1813.php>.

**Professor S.C. Wong**

- was appointed as a Member of the Environment and Conservation Fund Committee, and Chairman of its Waste Reduction Projects Vetting Subcommittee, The Government of HKSAR, from October 16, 2020 to October 15, 2022.
- was appointed as a Member of the Management Committee on the Smart Traffic Fund, The Government of HKSAR, from October 29, 2020 to March 31, 2023.
- was reappointed as a Member of the Advisory Council on the Environment, The Government of HKSAR, from January 1, 2021 to December 31, 2022.
- was appointed as Chairman of Logistics and Transportation Discipline Advisory Panel and Member of Qualification and Membership Board of the Hong Kong Institution of Engineers for the term 2020-2021.
- was elected as a Council Member of the Chartered Institution of Logistics and Transport in Hong Kong for two years with effect from October 1, 2020.

**A new book on Fluid mechanics, hydraulics, hydrology and water resources for civil engineers by Dr. A.W. Jayawardena**

Fluid mechanics, hydraulics and hydrology cover the basic scientific, mathematical and empirical knowledge necessary for civil engineers to manage the world's fresh water resources in an optimal and equitable manner without causing negative effects on the physical and biotic environment. Although there are several books that address these individual subject areas, there is no single book that covers the entire spectrum of the four core areas. The author's motivation to compile this book has come out of the need to fill this gap and to put on record the teaching material he has assimilated during his academic career in the Department of Civil Engineering of the University of Hong Kong, the International Centre for Water Hazard and Risk Management (ICHARM) under the



auspices of UNESCO, Public Works Research Institute, Japan, the Department of Civil and Environmental Engineering of the Hong Kong University of Science and Technology, and the Department of Civil Engineering of Chu Hai College of Higher Education. The book which is primarily targeted towards civil engineering students can also be a source of reference for practicing civil engineers to refresh and update their skills in the three core areas highlighted. Related research work carried out by the author and his co-workers and graduate students are also embedded in places where they fit in. More research oriented topics are covered in his first book entitled "Environmental and hydrological systems modelling".

Both these books are available in the departmental library.

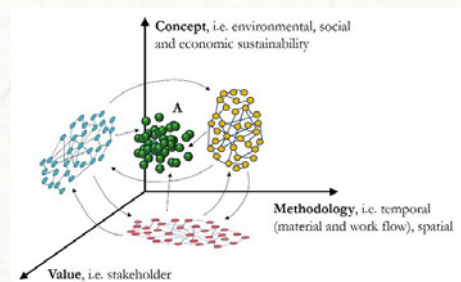
**Research Grants**

*Collaborative Research Fund*

**Professor W. Pan** has been awarded a three-year major research grant of HK\$ 5.75million from the Research Grants Council (RGC) of Hong Kong under the 2020/2021 Collaborative Research Fund (CRF) scheme for the project entitled "Optimizing Total Factor Sustainability of Tall Residential Buildings through Innovative Modular Integrated Construction". CRF is an interdisciplinary collaborative initiative.

The team of this project also includes Professor T.S.T. Ng, Professor Yuguo Li, Dr. R.K.L. Su and Dr. Winnie Law from HKU, Professor Christopher Leung from the Hong Kong University of Science and Technology, Professor C.S. Poon from the Hong Kong Polytechnic University, Professor Kincho Law from Stanford University and Professor Andy Dainty from Loughborough University.

There are three research objectives: (1) Create a new Total Factor Sustainability (TFS) concept for tall residential buildings, construct a TFS measurement framework by integrating the environmental, social and economic sustainability and stakeholder value, and use this framework to establish a novel TFS methodology and index; (2) Establish the scientific fundamentals of innovative Modular Integrated Construction (MiC) in delivering sustainable tall residential buildings, which will enable innovations in theory and methodology in the four aspects to optimize the TFS: structural design, structural materials, embodied carbon, and operational energy; and

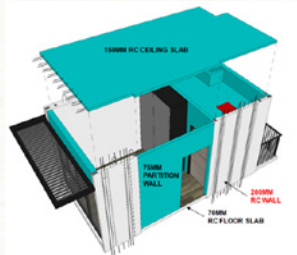


A conceptual framework of examining the dialectics of buildings' TFS.

(3) Develop MiC engineering solutions in the four aspects: high-performance and superior-maintenance structures, high-strength and lightweight materials, low-carbon products and materials, and low-energy passive design measures, for optimizing the TFS of tall residential buildings in Hong Kong, and validate the solutions to maximize the impact of the research.



TFS framework addressing system boundaries of buildings.



Module design example.

**Professor J. Yang** received the Collaborative Research Fund (CRF) scheme for the project entitled “Towards a comprehensive understanding of the performance of offshore wind turbine systems in complex environments”.

Wind energy has emerged as a promising source of renewable energy that offers significant potential for long-term reductions of greenhouse gas emissions. In particular, offshore wind energy is an attractive option for economies with vast coastlines and dense populations including Hong Kong and China. The rapid growth of the offshore wind power industry across the world in recent years brings many new challenges to researchers and engineers. The principal objective of this proposed research is, using a multidisciplinary methodology involving soil dynamics, geotechnics, structural dynamics, aerodynamics and hydrodynamics, to develop a better understanding of the performance of offshore wind turbines in complex environments and the key mechanisms. The research will provide first-hand data, new models and insights valuable for the development of more cost-effective and safer designs. This research effort is the first of its kind in Hong Kong aiming to contribute to the offshore wind energy development from an interdisciplinary perspective.

**Dr. S.D.N. Lourenço** (Co-PI) - Engineering a safer urban forest under extreme storms.

*Environmental Conservation Fund*

**Dr. T.F.M. Chui** – Design of sustainable drainage systems (SuDS) in hilly areas of Hong Kong.

**Dr. C.Y. Kwok** – Feasibility study of using dredged marine deposits stabilised with coal fly ash as fill materials for geotechnical projects in Hong Kong.

*Others*

**Dr. S.D.N. Lourenço** (Co-I) - Microencapsulation for hydrophobic enhancement in soils (Royal Society International Exchanges 2020 R3).

## Student Awards/Activities

### Student Awards

Mr. Au Cheuk Hang (June 2020 Grad) was awarded the Gammon Construction Limited Prize in Civil Engineering 2019-20.

Mr. Chan Chak Kwan, Mr. Kwan Tim Chung and Mr. To Lok Kan (CivE 3, 20-21) were awarded the YS and Christabel Lung Undergraduate Scholarship for Engineering Students (Renewal in 2020-21).

Mr. Chan Chi Yeung (June 2020 Grad) was awarded the Environmental Engineering Prize 2019-20 and the Ms Chu Yuk Baw Prize in Structural Engineering.

Mr. Chan Oi Sang Nelson (CivE 4, 2020-21) was awarded the Edward Keller Achievement Award in Civil Engineering 2019-20.

Mr. Gao Mingyuan (Jan 2020 Grad) was awarded the Chow Che King Prize 2019-20.

Miss Ho Yin Wa, Mr. Ip Tat Hei, Miss Lam Ka Man, Mr. Leung Man Lok, Miss Natalia Levinna, Mr. Lui Lap Hei, Mr. Tai Chun Hin and Miss Wu Wai Chi Joyce (June 2020 Grad) were awarded the Ms Chu Yuk Baw Prize in Civil Engineering (Capstone Design Project).

Mr. Hui Siu Wun (June 2020 Grad) was awarded the Civil Engineering Project Prize 2019-20 and the Centenary Scholarship for Engineering Students 2019-2020.

Mr. Lam Cheuk Yin Bryan (CivE 2, 20-21) was awarded the Dean’s Award for Engineering Students and the YS and Christabel Lung Undergraduate Scholarship for Engineering Students (Renewal in 2020-21).

Mr. Leung Chun Hoi (CivE 2, 2020-21) was awarded the Walter Brown Memorial Prizes in Mathematics 2019-20.

Mr. Pan Yiyuan (June 2020 Grad) was awarded the Williamson Prize 2019-20, the HK Cheng Prize in Civil Engineering 2019-20 and the Centenary Scholarship for Engineering Students 2019-2020.



Mr. Tang Lik Yin (CivE 3, 2020-21) was awarded the CL Tse Prize in Civil Engineering 2019-20 and the Ho Lu Kwong Prize in Civil Engineering.

Mr. Tsoi Yu Tung (June 2020 Grad) was awarded the Li Pai-lin Prize in Civil Engineering 2019-20.





Mr. Wong Jun Yan Johnson (CivE 4, 2020-21) was awarded the Tai Tung-Ngok Prize in Civil Engineering 2019-20 and the Centenary Scholarship for Engineering Students 2019-2020.

Mr. Yeung Chin Hou (June 2020 Grad) was awarded the Wing Lung Bank Ltd Prize in Civil Engineering 2019-20.

Mr. Lee Wai Chung, Mr. Leung Jing Shang Gordon, Mr. Siu King Hay (CivE 3, 2019-20), with another student from the Faculty of Architecture were awarded the **First-runner up in the Communications Competition 2019-2020** organised by the Institution of Civil Engineers HKA G&S. The prize presentation ceremony was held on June 16, 2020 in (The Cityview).



Lee Wai Chung, Leung Jing Shang Gordon and Siu King Hay won the first-runner up of ICE Communications Competition 2019-2020.

Our undergraduate students, Mr. Ha Long Sang, Mr. Li Cheuk Haang, Mr. Tsang Chi Ho, Ms. Wong Nok Lam Joyce and Mr. Yim Sheung Ching won the 1st Runner-up in the **CIC BIM Competition 2020**.



**First Runner-Up and Favourite Exhibition Booth Award, Young Professionals Exhibition Competition and Second Runner-Up, Chun Wo Innovation Student Award 2020**

The team comprising of Louis Brighton (Year 3), Mikael Ken Slamet (Year 3), Levinna Natalia (Class of 2020), Ammar Sohail (Class of 2020) and Kartikay Rana (Class of 2020) from the



Department of Civil Engineering; Immanuel William S. (Year 3) from the Department Mechanical Engineering; Welvin Bun (Year 3) from the Department of Computer Science; and Regina Tania Tan (Year 4) from the Faculty of Architecture have designed AZUMOS, a façade system to tackle the impact of global warming and climate change by reducing the electricity consumption for HVAC in existing building in Hong Kong. A case study on the K.K. Leung Building in the University of Hong Kong showed that implementation of the of AZUMOS reduced the total electricity consumption on HVAC by about 50% while giving a Return on Investment (ROI) of 270% to the building owner.

This design was awarded the First Runner-Up and Favourite Exhibition Booth Award at the Young Professionals Exhibition Competition 2020 (Undergraduate Category) on October 4, 2020. And on April 20, 2021, they were awarded as the Second Runner-Up at the Chun Wo Innovation Student Award 2020.

Ir LEE Ming Kiu, Owen, the former class representative of the class of 2013 of BEng (CivE), is the first engineer in Hong Kong who has received both **CIC Young BIMers 2020** and **Autodesk Young BIMer of the Year 2020** through his vision and involvement in driving BIM adoption as well as his contribution and achievement in the promotion of BIM in Hong Kong. He is one of the youngest CIC-Certified BIM Managers (CCBM). He is a Registered Professional Engineer, Chartered Civil and Geotechnical Engineer, Civil Engineering Surveyor, Registered Ground Engineering Professional and Accredited Adjudicator with extensive experience in tendering, construction, engineering design, contract administration and BIM management of mega infrastructure projects.

Owen is the Resident Engineer (PROG/BIM) of AECOM, leading the digital transformation, BIM adoption and construction innovation of the DC/2018/05 – Relocation of Sha Tin Sewage Treatment Works to Caverns – Site Preparation and Access Tunnel Construction. He is an advocate of adopting BIM in engineering design, construction planning and safety. The project has also been selected as the CIC BIM Projects 2020 and Autodesk BIM Awards 2020 - Honorable Mention.



Owen is also committed to share his BIM knowledge and connect with the industry. He is currently the Lecturer (Part-

time) at the Technological and Higher Education Institute of Hong Kong (THEi) and Hong Kong Institute of Vocational Education (IVE) teaching BIM and construction management. He is a member of the BIM dispute committee of the HKICADj and a professional member of HKIBIM and HKICBIM.

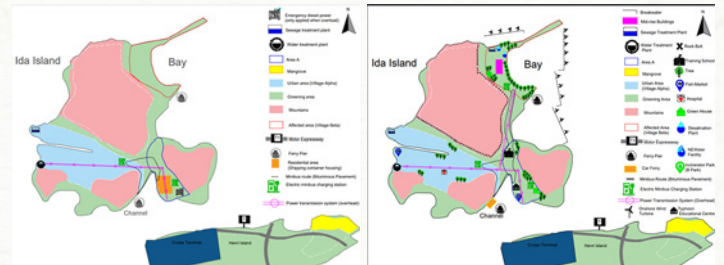
Our year 2 undergraduate students, Mr. Won Dzi Hei, Ms. Koon Chiu Yue, Mr. Shum Tsz Long, Mr. Ng Cheuk Lun and Ms. Ho Yuen Shun (Team EnSquad) won the **championship of the Communications Competition 2020–2021** held by ICE HKA G&S. Ms. Koon Chiu Yue is also awarded the best presenter award. The event was successfully held on February 6, 2021.



Communications competition is a team competition promoting the development of excellent communication for Institution of Civil Engineers' (ICE) young members. Competitors will be required to utilise their interpersonal skills as they present a make-up civil engineering project at a mock public consultation meeting. They will also need to win over the judges and audience as they make a presentation and face questions on how the project will affect different stakeholders. The competition is an interactive mock public consultation meeting where competitors present the development project and face questions from judges and audience who represent various stakeholders.

This year, given with basic background information and the project scenario, the competition requires the contestants to propose a plan to develop an imaginary island, Ida, as a contractor called the Future Development Co. Ltd. The plan should be innovative, technically practical, and financially feasible.

Team EnSquad proposed both short-term and long-term plans for the developments of the island, relocating the residents while introducing innovative technology on creating new water source, exploring on green energy and tourism spots to boost the local economy. Moreover, extreme weather is tackled by building water breaks, wind breaks and new alert systems for the residents.



Short term – Relocation Plan

Long term – Upgrade Plan

HKU Civil Engineering HKPF student Mr. Nandun Madhusanka under the supervision of Professor W. Pan and Professor M.M. Kumaraswamy achieved the **“Best Paper Award”** for the scientific paper entitled “Social Network Analysis of building energy and carbon policy networks in developing countries” presented in November 2020 at the 2020-World Sustainable Built Environment (WSBE) Conference, which is one of the most prestigious conferences on sustainable built environment organized every 3 years.



Mr. Runze Zhang, Ph.D. candidate in Geotechnical Engineering under the supervision of Professor J. Yang, received the **Best Student Presentation Award** at the 24th Annual Conference of Hong Kong Society of Theoretical and Applied Mechanics on December 5, 2020.

### Student Activities

Ph.D. student Mr. Zhenjie Zheng supervised by Professor W. Pan presented a paper entitled “Virtual Prototyping Based Path Planning of Unmanned Aerial Systems for Building Exterior



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Inspection" co-authored with Professor W. Pan and another researcher Dr. Mi Pan at the 37th International Symposium on Automation and Robotics in Construction (ISARC) organised online October 27-28, 2020.

Ph.D. student Mr. Mingcheng Xie supervised by Professor W. Pan presented a paper entitled "Opportunities and Challenges of Digital Twin Applications in Modular Integrated Construction" co-authored with Professor W. Pan at the 37th International Symposium on Automation and Robotics in Construction (ISARC) organised online October 27-28, 2020.

## Updates on Project Mingde

### About Project Mingde

Project Mingde was established by the Department of Civil Engineering in 2004. It provides an open platform for nurturing our students to acquire not only hard skills, but also to possess soft skills, such as a sense of social responsibility, by participating in real-world on-going civil engineering projects in remote impoverished regions in China and other Asian countries. We have a slogan "We grow as we build" and that is the core value of Project Mingde. Project Mingde attracts not only Civil Engineering students, but also students from other disciplines and institutions to participate in this meaningful programme. We hope that students would have personal growth through this experiential learning opportunity and participation in various real-life projects; and also education in impoverished localities in China could be provided. For more information about Project Mingde, please visit our official website at <http://www.civil.hku.hk/mingde/>.

Alumni are welcome to join Project Mingde and if you are interested to be part of us, please contact Dr. C.P. Wong at [cpwryan@hku.hk](mailto:cpwryan@hku.hk) (for projects) or Dr. K.H. Law at [adalaw@hku.hk](mailto:adalaw@hku.hk) (for communications).

### Wangdong Footbridge

The restoration of Wangdong Footbridge was completed last year to facilitate teachers and students of Wangdong Primary School walking across the river. This footbridge is a stressed ribbon bridge formed by steel cables under tension carrying a wooden deck, and anchored on concrete piers and abutments. This type of bridge is susceptible to vibration due to wind and dynamic loading on the deck, which make the users feel uncomfortable. A follow-up study is carrying out by students with advices from Professor F.T.K. Au to study the dynamic effects of this footbridge, and suggest mitigation measures to reduce the vibration.



Laying a wooden deck on the steel cables for Wangdong Footbridge.

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