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Department of Civil and Environmental Engineering, HKUST

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Department of
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Congratulatory Messages



Prof. Wei SHYY
President
The Hong Kong University of Science and Technology

As HKUST turns 30, so too does our University's Department of Civil and Environmental Engineering (CIVL). Following its establishment in 1991, CIVL has spent fully thirty years nurturing diverse talents who continue to accelerate the advancement of the civil engineering field across Hong Kong and beyond.

Always determined to transform problems into progress, the Department's students, faculty, staff, and alumni have been quick to respond to environmental challenges with the game-changing ideas and technologies needed to make a positive impact. In doing so, CIVL and its people understand that the most effective way to establish the long-term potential of their ideas is by first implementing them and then assessing the results. To further deliver on that commitment, the Department and its industrial partners do everything possible to optimize the potential benefits of their ground-breaking research.

The wealth of impactful innovations CIVL members have pioneered for the common good these last three decades is extraordinarily wide-ranging. Specific examples include everything from advanced water treatment, sustainable tree management and slope safety to COVID fighting, intelligent building monitoring, transportation networks and smart cities.

Visionary thinking has remained integral to the DNA of both CIVL and HKUST since day one and we can take justifiable pride in those who have chosen us as their launchpad when questing for excellence. I look forward to celebrating still more CIVL achievements as we head deeper into the 21st century and we each continue striving toward a more sustainable world.



Prof. Tim CHENG Kwang-Ting
Dean of Engineering
The Hong Kong University of Science and Technology

Prof. Cheng has been appointed as Vice-President for Research and Development, effective from April 1, 2022.

I take great pleasure in congratulating the faculty, staff, students, and alumni of the Department of Civil and Environmental Engineering (CIVL) on their remarkable achievements over the past 30 years.

Established in the same year as the founding of the University, CIVL has grown from a few faculty members to become a globally renowned department, ranked the world's No. 16 in the QS World University Rankings by Subject 2021. Such a result is the outcome of the tremendous efforts of the Department's dedicated faculty and staff, who have worked tirelessly to nurture and inspire generations of young talent; its motivated students, who have continually sought to achieve excellence in their studies; and its accomplished alumni, who have contributed so significantly to the infrastructural and environmental needs of Hong Kong, our nation, and beyond. Credit also goes to the wider community that has provided longstanding support.

Over the course of three decades, the Department has built a reputation for high-quality education and frontier research, supported by state-of-the-art facilities. Its success is evidenced by the prestigious awards and large-scale research funding that faculty members have received, global reach of research breakthroughs, impressive quality of students, as well as the outstanding achievements of alumni in various sectors.

The essential role of civil and environmental engineers in tackling major challenges of the future is widely recognized. From smart cities to green construction, from hazard prevention to environment conservation, the Department's students are well equipped to generate innovative solutions and make a lasting impact on the world.

With the solid foundation built by the early CIVL pioneers and concerted efforts of all its members, I am confident that the Department will make an even larger contribution to society and stride to the next level of excellence in the future.

Congratulations again to everyone who has contributed to CIVL's accomplishments over the decades. I wish the Department resounding success in the years to come.

香港特別行政區政府
發展局局長



SECRETARY FOR DEVELOPMENT
Government of the Hong Kong Special
Administrative Region

發展局局長黃偉綸



香港科技大學土木及環境工程學系
三十周年誌慶

木春
鐸霖
蜚潤
聲土





運輸及房屋局局長陳帆


廣栽桃李
協建香江

香港科技大學土木及環境工程學系三十周年誌慶

環境局局長黃錦星



作育功深
減碳樹範

香港科技大學土木及環境工程學系
三十周年誌慶



HKIE THE HONG KONG INSTITUTE OF ENGINEERS
香港工程師學會

On behalf of The Hong Kong Institution of Engineers, I take great pleasure on congratulating the Department of Civil and Environmental Engineering of The Hong Kong University of Science and Technology on its auspicious 30th Anniversary.

In a time that infrastructure development is growing fast and so is the demand for professional talents, the Department benefits the society and environment to a great extent by its dedication to promoting innovative technology and concepts for creating a greener and smarter city for achieving sustainability. The Department has always been taking an important role in educating capable and all-round engineers for the long-term prosperity of Hong Kong and beyond. The commitment to upholding the high quality of education, research and services to society while closely collaborating with the industry and the government are exemplary.

I wish the Department of Civil and Environmental Engineering reach greater heights in all spheres in the years ahead. I look forward to our continued collaboration to promote engineering to the public and making it an enticing study and career option to the young generation.

Ir. Edwin CHUNG Kwok-fai
President
The Hong Kong Institution of Engineers

HKIE THE HONG KONG INSTITUTE OF ENGINEERS
香港工程師學會

Congratulations to the Department of Civil and Environmental Engineering of The Hong Kong University of Science and Technology on the occasion of its 30th Anniversary!

Over the past three decades, the Department has strived wholeheartedly to nourish new generations of engineers by offering high quality engineering education to the students. As one of the leading educators in the field, its innovation and effort not only contributes to the industry and the academia, but also benefits our environment and community as a whole. The dedication and hard work for the improvement of the society and our quality of life are highly commendable. I trust that the Department will carry on with the same spirit and endeavour to nurture outstanding generations of engineers, who will no doubt be one of the most valuable assets of the community and our future successors.

May I wish the Department of Civil and Environmental Engineering continued success in the years to come.

Ir. Aaron K.M. BOK
Senior Vice President
The Hong Kong Institution of Engineers





Mr. Louis WONG
Chairman
ICE HKA 2021/2022

土木英才獻社會 科大作育三十載

香港科技大學土木及環境工程學系
三十周年誌慶



HONG KONG
WASTE MANAGEMENT ASSOCIATION
香港廢物管理學會

I am delighted to extend my warm congratulations to the Department of Civil and Environmental Engineering of the Hong Kong University of Science and Technology on its 30th anniversary.

Over the past three decades, the Department has been providing a solid foundation to nurture numerous outstanding engineers. These endeavors' accumulative effects on the wonderful development of Hong Kong can be witnessed today. Apart from its quality curriculum development and teaching, the Department also gains international recognition for its excellent research achievements. The Department has established very strong platforms for basic research studies and their transformations for practical applications, which materialize the successful outcome highly benefiting education, research, and productivity. I am confident that the Department will continue to play a vital role in advancing the civil and environmental profession not only for Hong Kong but also for the world.

In celebrating its 30th anniversary, I would like to wish the Department its continuing success in future endeavours and the many more brilliant milestones to come.

Prof. Kaimin SHIH
Chairman
Hong Kong Waste Management Association (HKWMA)



I would like to congratulate the Department of Civil and Environmental Engineering of the Hong Kong University of Science and Technology on the publication of this 30th anniversary booklet to ear-mark the great success and growth of the Department in Hong Kong since its initial founding as the Civil Engineering Department in 1992.

The great accomplishments of the Department are exemplified by the remarkable achievements of individual faculty members, students and alumni over the years. The Department has nurtured numerous Hong Kong engineers to becoming eminent leaders and experts in the government, business and educational sectors.

The Canadian Society for Civil Engineering Hong Kong Branch (CSCEHKB), founded by the late Professor Moe Cheung in 2003, is very proud and fortunate to have established a very strong tie with the Department. The CSCEHKB together with the Department have been actively involved in connecting and promoting the civil and environmental engineering profession between Hong Kong and Canada. Our good partnership has played a significant and valuable role in contributing to the continual growth of the bilateral Hong Kong-Canada relations.

On behalf of the Executive Committee of CSCEHKB, may I take this golden opportunity to express our best wishes for the prosperity and success of the Department for many years to come!

Ir. KAN Tak-cheong
Chairman
Canadian Society for Civil Engineering Hong Kong Branch

On behalf of the Wu Zhi Qiao (Bridge to China) Charitable Foundation, we would like to congratulate Professor Limin Zhang and all fellows of the Department of Civil and Environmental Engineering for the 30th Anniversary with outstanding work in the provision of high-quality engineering education to young profession. The achievement of the Department has not only recognized as one of the influential departments worldwide, but also with the impact for the community and underprivileged groups. In view that your students have devoted to the humanity services, it has demonstrated your Department's determination in responding and solving social needs with technical knowledge and compassion.

The bridge of partnership built between us has commenced since Wu Zhi Qiao was founded in 2007. Over the past decade, the HKUST Wu Zhi Qiao student team has been enthusiastically involved in the Wu Zhi Qiao projects as volunteers in initiating and implementing construction of footbridges and village infrastructures so as to improve the living environment of the villagers in the rural and remote areas in the Mainland China. Over the years, the HKUST Wu Zhi Qiao student team has involved in 11 footbridge construction projects across five provinces in China. Learning outcomes included remarkable enrichment experiences and life-changing stories among student volunteers and villagers. Most importantly, we have established many bridges of communication, knowledge and friendship.

May we extend our heartfelt gratitude to the endure support of your Department, professors and students. We are proud of our long-standing partnership. We look forward to continuing the journey to build bridges of knowledge and friendship, and together we pass on this spirit of “緣於橋 繫於人心無限 橋無止” for many generations to come.

Mr. Kenny LEUNG
Chief Executive Officer
Wu Zhi Qiao (Bridge to China) Charitable Foundation





Prof. ZHANG Limin
Head of the Department of Civil and Environmental Engineering
The Hong Kong University of Science and Technology

On this milestone occasion, we not only celebrate the Department's anniversary but also the fact that it has entered the world's top echelon within a relatively short time. Our Department continues to expand, pioneering research and development in smart cities, next-generation infrastructure, energy and the environment, and much more. Our horizons extend well beyond traditional civil engineering, looking toward shaping a smart, green, sustainable future. We therefore continue to revamp our curricula and programs to offer students a state-of-the-art engineering education and a uniquely tailored experience, instilling in them a sustainability mindset and preparing them for the challenges in an increasingly digitalized world.

Over the thirty years we have graduated some 3,400 undergraduate students, 2,300 MSc students, and 700 MPhil and PhD students. Today, these alumni spread across the world, contributing to society in various capacities as engineers, academics, administrators, business leaders and entrepreneurs. Nevertheless, as diverse as their endeavors may be, they have something in common — they all exemplify HKUST's "can-do" spirit.

Our Department has indeed grown up with Hong Kong: Back in the 1990s, our faculty and alumni already began to make significant contribution to the magnificent Ten Core Projects of the time. In the next 20 years, they continued to fill immensely important roles in the new Ten Major Infrastructural Projects, which included the Hong Kong–Zhuhai–Macau Bridge. Looking ahead, unprecedentedly ambitious projects await — the Lantau Tomorrow Vision and the Northern Metropolis, which will bridge Hong Kong with Shenzhen and the rest of the Greater Bay Area, and our graduates and faculty will sure have a tremendous impact and presence.

There has never been a better time for civil engineering in Hong Kong, in the rest of the Greater Bay Area, and in Asia. Indeed, the future is very bright!

From Our Emeritus Faculty



It was February 1992, the CNY holidays had just finished. CK Shen, Kin Man Lee, Dave Wareham and myself had just had our initial meeting to plan the Department of Civil and Structural Engineering at HKUST. February, March and April of 1992 were exceptionally foggy and the Departmental temporary offices on the 4th floor overlooked, often hidden behind fog, the newly completed sundial and entrance roundabout to the atrium. The hill behind the sundial and entrance road was barren of any trees, save for the seedlings that had been planted to help stop the erosion caused by the construction earthworks. The academic concourse was not completed and there were only stairs and the escalator from the atrium stopping near the entrance of the computer barn.

The development of an academic engineering department and the making of a new university is a detailed and complex activity. The four initial academics of the Department were involved in many activities not just related to the Departmental development, but the university development as a whole. For the Department, work was divided with CK Shen as Head and mainly focused on faculty recruitment and developing administrative systems within the School of Engineering as well as Department, I was Director of PG and UG Studies coordinating the initial curriculum, Dave was in charge of the space allocation from laboratories to designated classrooms and study areas, and Kin Man's main focus was the student recruitment.

Our first cohort of 40 students would be a celebratory affair. How would students know about the university and "risk" entering an untested university and Department with only

four faculty at that stage, no developed laboratories and essentially no proven history. The dream of making a world class university and Department had to be evident to potential students. A decision was made that we interview every applicant from JUPAS and Direct Entry. From these interviews we were to portray the dream that would also be their dream.

In July 1992 the faculty numbers increased to eight, the first cohort of students arrived in September of 1992 and the dream was taking place. The rest of the story proved dreams can become reality. Students took the challenge becoming leaders to develop the Department, winning the Departmental Athletics and becoming leaders within the University.

Many challenges came and went throughout the initial decade of the University and Departmental development. But the ability to face the challenges of a developing world-class Department and University have been amongst the great achievements of our graduates.

I am fortunate enough to meet graduates around the world in senior and responsible positions and am proud to be able to congratulate all on their development and achievements from a dream to a reality.

May the next 30 years continue to develop all of your successes and achievements.

Prof. Neil MICKLEBOROUGH



I am delighted to congratulate the HKUST Department of Civil and Environmental Engineering on its 30th anniversary. Thirty years ago, I was excited to join and be a faculty member in the Department. Since its inception, the Department has been highly recognized for excellence in research and teaching and has supplied civil engineering industry and universities with highly-qualified and passionate professionals and faculty.

I am proud to have been a part of the Department. Once again, congratulations on 30 years of history-making. The future of our Department is bright and great things are happening. Happy birthday, HKUST CIVL!

Emeritus Prof. J.S. KUANG

My heartiest congratulations to HKUST and the Department of Civil and Environmental Engineering on your 30th Anniversary. Who thought 30 years ago that this university and our department would become not only a leading research and teaching institution in Asia, but also one of the top-rated universities in the world? Of course, this was the intention from the outset, but intentions don't guarantee success. From a starting group of only six faculty members in 1992, the department has grown and matured into a powerhouse group of 71 internationally recognized faculty and 29 staff. This resulted from a novel vision for Hong Kong tertiary education propelled by the hard work and commitment of faculty and staff from the very beginning of the university. It also required an equally great commitment from student and alumni populations, the heart's blood of any institution of higher learning. It was a great privilege for me personally to have been able to make a small contribution to this remarkable achievement, and I sincerely wish all of you many more decades of continued success shaping the future of education and society in Hong Kong and the world.

Prof. Duncan MCINNIS



I am delighted to congratulate HKUST, as well as faculty members, faculty at large, and staff of the Department of Civil and Environmental Engineering: You have achieved what's considered almost impossible in the academic world — to build up a world-class university and department in less than 30 years. It has indeed been nothing short of a miracle!

I was privileged to join the University in 1992. Over the years, with tremendous enthusiasm I participated in teaching and research, recruiting outstanding young scholars to the faculty, assisting in the design of academic programs, and admitting high-caliber undergraduate and graduate students, etc. Everyone in the Department has worked tirelessly toward achieving academic excellence, and this spirit lives on. Today, many of our alumni have become professors, deans, and heads of departments of universities, or executives and professionals in the industry, engaging in a wide range of teaching, research, and/or other professional endeavors in Hong Kong, China, the U.S., UK, ..., all over the world. Their professional success is the best testament and measure of an "outstanding university", and UST has definitely earned that honor.

It is my sincere hope that the Department (along with the University) will continue to grow and cement its place as a world leader in civil engineering.

Emeritus Prof. Paul T.Y. CHANG

I take great pleasure in congratulating the faculty, staff, students and alumni of our Department of Civil and Environmental Engineering of the Hong Kong University of Science and Technology on this auspicious occasion of its 30th anniversary.

I was fortunate to join the Department in July 1993 while it was still in its infancy. We started off with little more than empty labs but high aspirations to build a world-class university in Asia. We also had youth — I still recall my very first day of class: none of the students could tell me apart as their teacher, until I got up, went to the board and began writing... I derive great joy from having witnessed the remarkable growth and development of the Department over the years.

Today, while still very young, the Department is not only one of the leading civil engineering departments in Asia, but enjoys also a global reputation. The QS World University Ranking by Subject currently ranks the Department 20th in the world. Eighteen of the Department's faculty members have ranked among the top 2% of the world's most highly cited scientists in their respective areas of specialty, according to a compilation by Stanford University in 2021.

Let's celebrate the Department's 30th birthday. I am confident that, with the solid foundation laid over the past three decades, coupled with the visions and continued efforts by all concerned, the Department will grow from strength to strength and scale new heights in its future development.

Emeritus Prof. Chun Man CHAN





Congratulations to the HKUST Department of Civil and Environmental Engineering on its 30th anniversary!

In October, 1993, upon completing my PhD defense at Northwestern University, I started to look for a faculty position in universities. One day, I received a call from Prof. Paul Chang, who was then head of the Department of Civil Engineering at the University of Akron. He told me that he had picked out my résumé from a shortlist of candidates and was looking at it with particular interest and enthusiasm, but rather than talking up Akron to me, he very earnestly recommended that I consider HKUST; he had just spent his sabbatical leave at HKUST and found it to be a wonderful and beautiful young university. On 1 July 1994, I joined HKUST, and have never looked back since. So, here, I'd like to once again thank Paul for bringing me to UST!

At HKUST, I enjoyed very much not only the excellent starting funds but also academic freedom. The fact that I could recruit students with different backgrounds — civil, mechanical, chemical, physics, materials and electronics — provided solid foundation for my interdisciplinary research and innovative development, the output of which included five technical books (including *Advanced Concrete Technology* published by John Wiley) and more than 400 papers, with a Google Scholar citation of 23,983 and an h-Index of 85. In addition, more than a hundred PhD/MPhil students and scholar have received training in my research group. They are now either part of the mainstay in research and teaching of the building materials field in China, or enjoy professorships in the United States, the UK, Canada, India, and Saudi Arabia. These are just glimpses of all the wonderful achievements and recognitions for research and teaching excellence that the Department has attained and garnered over the years, all the while supplying the civil engineering industry with countless highly-qualified and passionate graduates and professionals, in Hong Kong and in the Mainland.

I am very happy to have worked with all the colleagues in the Department. I miss the joyful days we spent together (especially when *maotai* was involved). Let us raise our *maotai* cups to the Department and HKUST!

Prof. Zongjin LI
Chair Professor
University of Macau

Spring 1995 marked the beginning of my association with the Department where I spent six months of sabbatical. By the time I joined the Department in November 1998, it had taken shape with multiple disciplines staffed by enthusiastic young faculty members. Over the years, their passion and energy in teaching and research have propelled the Department and the University to world-leading positions — the countless outstanding undergraduate and postgraduate students whom the Department has nurtured to become leading professionals, researchers and academics are a tribute to their hard work and dedication.

I have fond memories of the Department. Most of all, I feel privileged to have been a part of its growing and maturing and am thrilled to witness its successes in the past 30 years.

I congratulate the Department of Civil and Environmental Engineering on its 30th Anniversary and wish it continued success to consolidate its position as a world-class university department.

Prof. Kenny KWOK
Professor Emeritus
The Hong Kong University of Science and Technology and
University of Sydney



Congratulations to HKUST and the Department on your 30th Anniversary!

HKUST's Department of Civil and Environmental Engineering has grown from a “new kid on the block” into a world-renowned department of first-rate scholars and outstanding graduates, many of whom now work in top companies and universities across the world. Such a mission to build a department of the highest academic quality and integrity, and to contribute to society has always been our founding fathers' vision. Over the years, the Department has been tremendously privileged to build upon the groundwork that they laid down. I had the pleasure of working with several of these early builders of the Department — CK Shen, Wilson Tang, Moe Cheung, Howard Huang — some of whom I had met even before I joined the Department in 2010. Wilson Tang, for example, I remember fondly not only for his insistence on academic excellence and connecting theory to engineering practice, but also for his flair on the tennis court.

Civil engineering is traditionally considered a prestigious profession in Hong Kong — this fact alone has helped the Department attract some of the best high school graduates over the years. To teach these young talents, the Department has also nurtured a generation of outstanding teachers, supporting them throughout the course of their development from fresh PhD graduates into internationally recognized scholars. Indeed, it is by no small feat that HKUST now ranks among the global best in civil engineering.

That said, we ought to caution ourselves against putting too much emphasis on individual short-term pursuits or on key performance indicators (KPIs), as doing so will risk sacrificing diversity and commitment to knowledge transfer. Instead, we should recognize that real-world engineering challenges are very difficult to solve and entail long-term research collaborations with the industry and the government. Such research pursuits require tremendous vision, audacity, tenacity, etc. — some may seem unrewarding at first,

but can lead to insights and rewards that sometimes even exceed expectations. I am glad to have seen in recent years younger, very high-calibre colleagues making successful bids for extremely competitive large-scale team-based research projects: Charles Ng — Area of Excellence in Geotechnical Engineering, and Mohamed Ghidaoui — Theme-based Research Scheme in Smart Urban Water Supply Systems, for example. These undertakings will surely have tremendous impact in the years to come.

In addition to research, teaching is also at the core of a university. In the Department I've had the pleasure of knowing some of the best, most passionate teachers, as well as very bright students, who can be the source of rather rewarding experiences and memories. A few years back there was an episode where I almost failed a final-year student on his poorly written summer internship report, but I didn't, not wanting to be the first professor in the Department to ever do so. The student was deeply remorseful and appreciative of the second chance that I gave him, and revised the report to satisfaction. What's more, after he graduated, he still made a point to stay in touch with me. It is memories such as this that make our careers all the more fulfilling.

Congratulations to HKUST and the Department of Civil and Environmental Engineering! I look forward to many more contributions from our graduates, not only to the local society, but also to the Greater Bay Area (developing it into an international innovation and technology hub) and beyond. May your spirit continue to thrive and soar!

Prof. Joseph Hun-wei LEE
FREng FHKEng
President and Chair Professor
Macau University of Science and Technology



HISTORY IS THE GREATEST TEACHER

The Department
Over the Years

A STROLL DOWN MEMORY LANE

Thirty Years of the Department of Civil
and Environmental Engineering

A Beckoning Dream

It might be difficult to imagine how, just over a span of thirty years¹, HKUST managed to emerge out of some rolling slopes by the Sai Kung Sea into a place of vibrant learning, research and intellectual exchange today. It was 1992; Prof. Neil Mickleborough² was already a senior lecturer³ at the University of New South Wales in Australia, but had agreed to relocate to Hong Kong and join HKUST: "My friend — the Chancellor of UNSW at the time — had been to Hong Kong and met Chia-wei Woo⁴, and when he knew that I was heading to Hong Kong (to attend a friend's wedding), he said, 'You should drop in and talk to President Woo.' I almost didn't..." — the Department of Civil and Environmental Engineering⁵ would have been rather different had Mickleborough opted not to join — "I met Woo and H.K. Chang⁶ at Harbour City. We then took a drive out to the UST site. It was just a construction site..."

The Founding Head of the Department was Prof. C.K. Shen. He had the monumental task of building not just a civil engineering department but a world-class one, and he needed the right people — people who not only shared the vision but understood what it would take, and were willing to be a part of that undertaking. Shen planned to have four faculty members by the end of 1991. They would work through the next six months, by which time the Department would be fully operational with students, curricula, faculty and staff, and facilities all in place. The truth is, however, "in six months you don't get a lot of things done — you are still getting yourself organized," says Mickleborough.

¹ HKUST's inception in fact occurred back in 1986, with construction of the campus commencing soon after at the site which used to be the Kohima barracks.

² Prof. Neil Colin Mickleborough, native of Tasmania, Australia, was among the very first to join the Department. Over the years, not only has he been instrumental in building up the Department, his influence has also been most enduring.

³ In Australia, the rank of senior lecturer is comparable to associate professor in the North American system.

⁴ Prof. Chia-wei Woo (吳家璋) was the Founding President of HKUST.

⁵ At the time, the Department was named the "Department of Civil and Structural Engineering", which was in line with the corresponding department at HKU and as recognized by the Hong Kong Institution of Engineers.

⁶ Prof. Hsin-kang Chang (張信剛) was Founding Dean of the School of Engineering, who went on to become President of City University of Hong Kong. Chang was instrumental in appointing Prof. C.K. Shen as Founding Head of the Department.



Finding those right people was far from easy: “You’ve got two groups of staff coming to the university — a series of older professors who were over 60 and ready to retire and taking one or two contracts only; and fresh PhD graduates,” explains Mickleborough. “For people in mid-career, like I was, they would ask themselves, ‘Why would I leave a perfectly good job to join a brand new university?’” There was an additional challenge: “C.K. was hamstrung with the philosophy of the University — research, purely and simply. You wouldn’t be employed unless you have potential for research.”

Among the fresh graduates arriving to launch a career was Prof. Irene Lo⁷, who had just obtained her PhD from the University of Texas at Austin. As Lo remembers: “I heard about UST back in the States. I was already preparing for oral defense in May in 1992, and because I was about to graduate, I applied for a position — I had also applied to NTU in Singapore — C.K. saw my application and contacted me for an interview. He even flew out to Texas; I drove for an hour from Austin to meet with him in a restaurant. Soon after, I received the NTU offer, which I told C.K. about. He was very kind — he couriered me an offer within the week. Everyone around me advised me to choose Singapore, but in the end I opted for Hong Kong, because I had been away for quite a while...”

Joining the Department with Lo in July 1992 were Professors Mark Davidson⁸ and J.S. Kuang⁹. Davidson, whose wife is Malaysian-Chinese, was just finishing a postdoc at the University of Cambridge at the time: “We were interested in working in Asia.” His roommate at Cambridge was (the now Professor) Jimmy Fung¹⁰, who was instrumental in connecting Davidson with UST. For Kuang, he also has a Cambridge connection — Cambridge was where he obtained his PhD: “I was in the UK. H.K. Chang came and I met with him in London. At that point I had received offers from the UK and Australia, but something about being in a brand new university — as opposed to a more established, perhaps old-fashioned, place such as HKU — drew me to UST.”

⁷ Prof. Irene M. C. Lo is currently a Chair Professor of Environmental Engineering of the Department.

⁸ Prof. Mark James Davidson is a Professor of Environmental Fluid Mechanics at the University Canterbury in Christchurch, New Zealand. Davidson left UST and the Department in 2000.

⁹ Prof. J.S. Kuang is Professor Emeritus of Structural Engineering of the Department.

¹⁰ Prof. Jimmy Chi Hung Fung (馮志雄) is currently a Chair Professor in the Department of Mathematics, and Associate Provost of UST, among numerous posts.

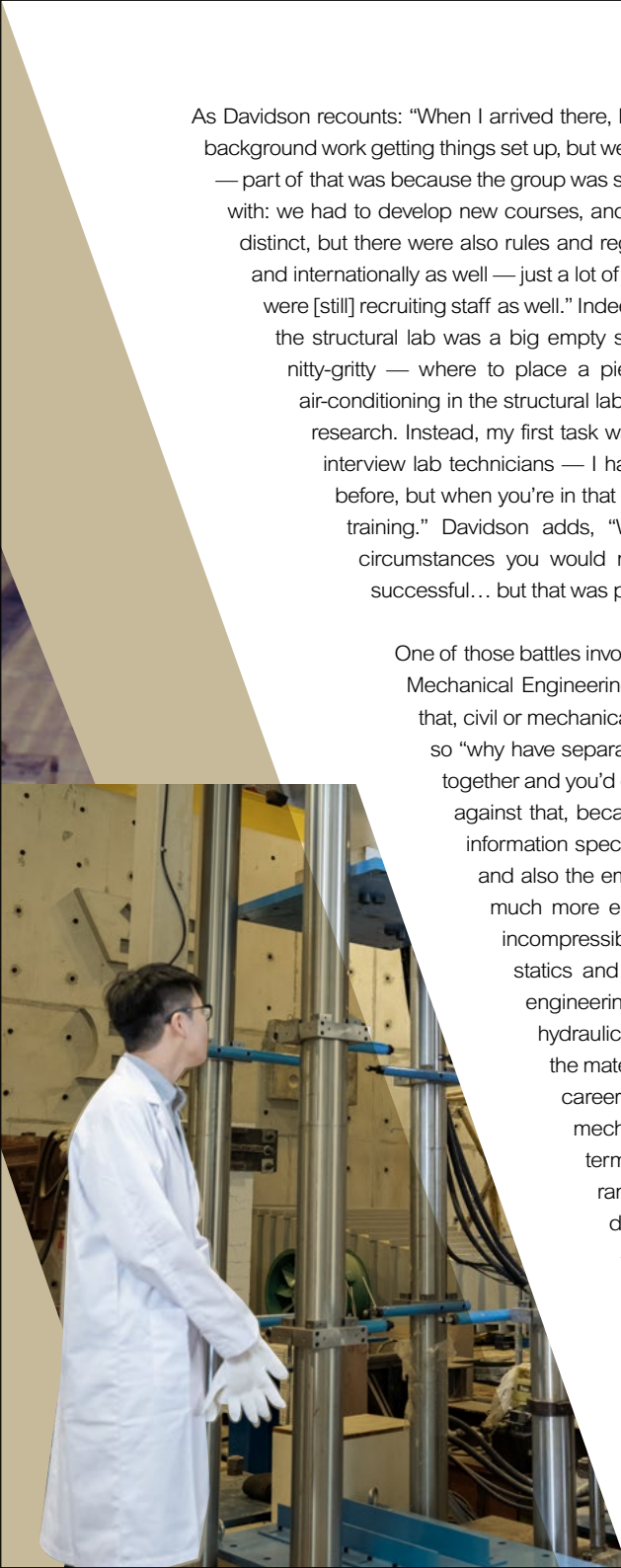
Weathering Many a Storm

To be sure, becoming attached to such a young university with no prior-installed framework does have its allure: one has the flexibility to write his own rules and the freedom to make decisions and undertake projects according to his own heart’s desire, so to speak. Nevertheless, as the initial faculty octet — Professors Kin-Man Lee, David Wareham and Duncan McInnis, in addition to Shen, Lo, Kuang, Davidson and Mickleborough — would soon enough find out first-hand, there were numerous sources of problems. “Things were up in the air. We had less than twelve months to get a program fully up and operational,” says Davidson. Mickleborough echoes: “There were a lot of headaches trying to get a department running. It was starting from scratch — everything had to be done. The place was a revolving door, and you’re forever fixing problems.”

For Davidson, who was looking to first establish and then maintain a career, the early days at UST were very difficult. Normally, an early-career academic would be able to expect to enter a place to have senior and mid-career academics ready to mentor him. That was not the case at UST in 1992; instead, he found himself in the deep end of the pool expected to just figure it all out. “In a more established environment, you can work off more data-driven decisions ... you can actually look at student number and staff number and who’s doing what and there’s a history and so on ... the big difficulty that [we] had was that none of those numbers existed.” As a result they often had to lobby for support from the University’s higher administration, to get them to listen and believe that what they said they needed was, in fact, needed. “Of course, you’ve got others in other departments saying the same thing,” and it is always tricky for university administrations to fairly allocate resources between departments and divisions.

“My first impression of the University was how small it was,” says Lo, “All there was were the little bit that surrounded the Piazza and the few dormitory buildings down the hill.” The area that the Department currently occupies (near lifts 27 and 28 on the third floor) had yet to be built. “We didn’t even have an office.” During the first months, the Department worked out of a temporary office — on the fifth floor directly above where today’s campus security office is (near lift 3), overlooking the sundial. The space was partitioned into cubicles. “Irene and I had neighboring cubicles,” says Kuang, “We could just stand up and talk to each other.” Gradually the Main Academic Building expanded, and the Department moved into its current area toward the end of 1992.

“Everyone had a senior position,” says Mickleborough. Even the most junior faculty members, as much as they might have limited administrative experience, had to help make important decisions and set everything up. Shen delegated the more administrative tasks to Mickleborough. “I didn’t have a lot of experience myself either, except ten years of teaching university — so I knew the politics — I tended to go more into administrative stuff.”



As Davidson recounts: “When I arrived there, Neil and C.K. [plus Lee and McInnis] had been doing a lot of background work getting things set up, but we had no laboratory facilities. We didn’t have a program as such — part of that was because the group was small, and to find a program you need a bigger group to do that with: we had to develop new courses, and decide on what the program was going to look like, make it distinct, but there were also rules and regulations around accreditations within the Hong Kong system and internationally as well — just a lot of things that people now take for granted — and, of course, we were [still] recruiting staff as well.” Indeed, the layout of the environmental lab was still being drawn up, the structural lab was a big empty space, and there was no fluids lab. Every detail down to the nitty-gritty — where to place a piece of equipment, for example, or whether or not to have air-conditioning in the structural lab — had to be thought up. “I had come to UST prepared to do research. Instead, my first task was to lay out the environmental lab,” says Lo. “We also had to interview lab technicians — I had just graduated and had never interviewed lab technicians before, but when you’re in that situation, you just find a way and get it done. It was on-the-job training.” Davidson adds, “We spent a lot of time fighting battles — under normal circumstances you would not have to do that — to get basic things in place to be successful... but that was part of the challenge.”

One of those battles involved whether or not to share a fluids lab with the Department of Mechanical Engineering¹¹. The University’s higher administration was of the opinion that, civil or mechanical, it would be “the same fundamentals” taught to the students, so “why have separate classes and labs?” Davidson explains: “[Bringing] them all together and you’d end up having these huge classes — and of course we fought against that, because what that does is it prevents you from having contextual information specific to civil engineering or specific to mechanical engineering, and also the emphases are different — the mechanical engineers would put much more emphasis on compressible fluids, but we generally deal with incompressible flows. The other thing is, when you’re teaching things like statics and dynamics and so on, we teach that in the context of civil engineering applications — so we are looking at hydrostatics, dams, hydraulic systems and so on. That helps to motivate the students to learn the material, and they can see where it’s going to head in terms of their careers. But if we were doing a generic mechanical-civil [fluid mechanics course], we wouldn’t be able to get the emphasis right in terms of the fundamentals and we would have to have a broader range of applications, so it actually limits our ability to go into depths of the disciplines and areas. If you have a civil class of 40 and a mechanical class of 40, it might be worth doing, but when you have large classes you’re actually downgrading the learning environment for the students by putting them together in the first place.”

¹¹ HKUST’s Department of Mechanical Engineering has since become the Department of Mechanical and Aerospace Engineering.



CK SHEN

Prof. C.K. Shen (沈智剛, 1932–2012), Professor of Geotechnical Engineering, obtained his PhD from UC Berkeley. He taught at UC Davis (for 24 years, becoming Chair of the Civil Engineering Department) before taking up the position of Head of the Department at UST in July 1991. Shen had over 30 years of teaching, research and consulting practice in geotechnical engineering. His interests and expertise were in soil reinforcement technology, land reclamation geotechnical engineering, characterization of soil behavior and soil-structure interaction. Shen is credited (with Romstad and Herrmann) for developing analytical tools to analyze reinforced earth walls. He was awarded the ASCE 1970 Collingwood Prize and 2001 Thomas A. Middlebrooks Award.

During a 2005 interview, Shen recounted his tenure at UST: “At the first instant I didn’t particularly want to [go to UST] — I thought ‘I have everything here [in the U.S.]... and there’re a lot of things I can do.’ But once I saw the [place], the people, and learned of its mission, I came back and told my wife, ‘We should go.’ ... The location was just unbelievable... but really the real reason that attracted me there — one of the reasons — was that I thought this was the closest I could go to China... Also, the people [at UST] were very ambitious — They wanted to build the best research university with a different kind of teaching style than all other schools [in Hong Kong]. From my own point of view, I came from that part of the world, so it was time for me to [give back]... When I was there, in a total of seven years I hired 25 people and built a sizable department; the people I hired were from all over the world, and we built up a very nice place — I’m very proud and very happy to have that experience.”

Upon retiring from HKUST in 1998, Shen returned to UC Davis where he maintained an active interest in geotechnical engineering, during which time he also enjoyed hiking, nature photography and traveling.

The Department began with just a few master's students. These students would go on to become the University and Department's first graduates. Meanwhile, planning and preparation for the undergraduate curriculum was underway. In fact, from January to August 1992, the eight foundation members of the Department worked tirelessly to ensure that, come September 1992, the undergraduate program could commence. In addition to laying out the three-year curriculum and appointing new faculty and staff, as Lo remembers, "we visited numerous secondary schools to promote UST and the Department and help recruit and interview prospective students." It was an uphill battle, as Mickleborough summarizes: "How do you interview to get a student to understand that they want to do engineering, and that they want to come to a new university with no name, no record, no nothing?"

Nevertheless, in September 1992, the Department had its first undergraduate cohort comprising about 40 students. "Because there were only the few of us, we had to teach courses across the board," Lo recounts, "Even though I was teaching courses related to environmental engineering, they weren't necessarily within my area of expertise, but, it was a great experience nonetheless. Being at such a new place, you get to do things you'd otherwise never do in a well-established institution — drafting policies, for example, which were well beyond the research that we were trained to do."

However, as if everyone did not already have enough to deal with, soon the Department had to undergo accreditation for its academic programs. Davidson explains: "Under the Washington Accord¹², there are quite detailed criteria dictating requirements that have to be met and key areas that need to be covered." "We were all rather anxious," says Lo, "I had never done accreditation in the U.S. before." An advisory board had to be formed for the accreditation¹³. "We had to invite and pay for a Joint Board of Moderators (JMB) from the UK to come," explains Mickleborough. Kuang adds, "We weren't too experienced with the documentation for the accreditation. I consulted with HKU a little bit." Normally, to get accredited, a department would have already graduated students. That was not the case for the Department in 1993, so the Department welcomed ICE/IStructE's¹⁴ decision to grant them conditional accreditation. The Hong Kong Institution of Engineers (HKIE) has since assumed the responsibility of accrediting engineering programs in Hong Kong universities. "We — the Civil Engineering Department — were instrumental in getting the HKIE to become the accrediting body," says Mickleborough.

Movers and Shakers

Through the many storms that the Department weathered over the years — global financial crises, pandemics, the "3-3-4" secondary school system in Hong Kong (introduced in 2012), societal turmoil, clashes between cultures and ideologies, or between traditional and new thinking styles — it always had steadfast leadership to count on.



"A great leader elicits the potential in you, and makes you realize that you too can contribute something meaningful and important no matter how young or inexperienced you might be — C.K. was that leader," Lo recalls, "He was a father figure to us. He encouraged us to not shy away from leadership roles and to speak our mind, even if we might feel apprehensive. He was open-minded, and he made everyone feel valued." Kuang agrees, adding, "C.K. was a very kind man."

Mickleborough describes Shen as "gentlemanly" and "calm-mannered". "He had a real skill of not inflaming situations and keeping things calm and cool. He was genuinely interested in getting good outcomes across the board. He was an overall fantastic Head of Department," Davidson recalls, "Since leaving Hong Kong, I'd just remember at times that 'C.K. would not have inflamed this situation' and I'd back out of it — If you add fuel to the fire it's much harder to get things resolved. If we hadn't had a Head like C.K., it would have been very hard to keep the group together, and get the Department on a solid foundation."

¹² The Washington Accord: <https://www.ieagreements.org/accords/washington/>

¹³ The board also solicited help from such leading civil engineers as Ir. Dr. Raymond Ho (何鍾泰), structural engineer, member of the Legislative Council (1998–2012) and ex-president of HKIE (1987/88), and Ir. Ronald James "Jim" Blake (詹伯樂), civil engineer, former Secretary for Works (1991–1995) and ex-president of HKIE (1991/92), both of whom were supportive of and instrumental in facilitating the accreditation.

¹⁴ These are the Institution of Civil Engineers (ICE) and Institution of Structural Engineers (IStructE) of the UK.

WILSON TANG

Prof. Wilson Tang (鄧漢忠, 1943–2012), Chair Professor, obtained his PhD in Civil Engineering from Stanford University. Before joining HKUST, he was Professor and Associate Dean of the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign, where he taught for 27 years.

Throughout his career, Tang made significant contribution in areas of safety and reliability analysis, pioneering and promoting reliability-based and probability methods for risk mitigation and design, particularly in geotechnical engineering and infrastructure engineering and management. In addition to being a distinguished academician, he also had an appreciation for the finer things in life — he was a food and wine connoisseur, loved music, hiking, and enjoyed traveling the world, and loved to share a good laugh. "He helped build chemistry in the Department — he has certainly gotten a number of us into fine wines and gourmet," says Lo.

To honor Prof. Tang, with support of the Professor Wilson Tang Memorial Fund, the Department launched in 2013 the Professor Wilson Tang Scholarship, Prize, and Bursary, awarded each year to deserving undergraduate students.



In the ensuing two and a half decades, the Department would continue to evolve into one of Asia's best civil engineering departments under four more Department Heads — Professors Wilson Tang, Moe Cheung, Christopher K. Y. Leung and Hong K. Lo¹⁵ — until Prof. Limin Zhang assumed office in 2021.

Tang, who became Head of the Department in 1996, in addition to his academic prowess, was a passionate, dedicated, loving teacher and mentor who genuinely wanted the best for the Department and his students. “He was at the pinnacle of his academic career in the U.S. but he sacrificed that to come to UST. During his time as Head of the Department, he all but put his own research on hold in order to devote more time to leading and managing the Department,” Prof. Charles Ng¹⁶ recalls. “Tang nurtured not only his own area but all areas of civil engineering across the board, inviting well-renowned veteran experts to come as visiting scholars to mentor the younger, junior faculty members. Also, as much as possible, he stayed involved with the development of all the areas, taking part, for example, in their academic excursions even if it wasn't his own area of expertise. He was selfless, fair, transparent, meticulous, and approachable, and he liked to reward people who delivered, which contributed greatly to the success of the Department. I particularly learned from him as a leader how to be thorough, to give people the benefit of the doubt, and not to be (prematurely) judgmental, especially when investigating and resolving problems and making decisions. Also, under Tang's leadership, at the time, we were the only civil engineering department in the world to have both a wind tunnel and a centrifuge¹⁷ under its tutelage.”

Cheung, on the other hand, brought to the Department a wealth of experience from the industry: For a number of years, Cheung was a director for Public Works and Government Services Canada in charge of infrastructure-related research and development activities for the Canadian Federal Government. At the same time he maintained an academic connection — he was the Director of the Ottawa-Carleton Bridge Research Institute, and an Adjunct Professor in the Department of Civil Engineering at both the University of Ottawa and Carleton University. At UST, he continued to take on a lot of projects. “He was a very busy man with an innate need and passion to do everything and help everyone,” recalls Prof. Ben Chan¹⁸, who completed his PhD studies under Cheung's supervision.

Labor of Love

Looking back, we did make a lot of sacrifices — time, for example, and in a way we sacrificed a lot of our own research,” Kuang says, “But, *c'est la vie* — there's no point regretting anything.” Lo agrees: “UST has been a once-in-a-lifetime experience. Opportunities like this are hard to come by. The University and Department climbed up the global rankings very rapidly — almost miraculously so — and to know that all that hard work has come to fruition makes it all worthwhile.”



Davidson remarks: “I certainly don't regret it... I enjoyed many aspects of it. I worked with some really great people. It was hellishly frustrating at times and I wouldn't want to put myself through that again, but the outcomes in the end have been really good.”

Indeed, thirty years of building and cultivating the Department and the University was a labor of love. “We — professors, teachers, mentors... — are like candles. What we offer is the candlelight, and as we illuminate others we expend ourselves,” says Lo. Kuang echos: “Love — that's what matters: If you love your students and care about them, they'll know. They always know.”

¹⁵ Profs. Leung and Lo, who continue to be on the faculty of the Department, are featured in an interview entitled “Taking the Helm” in this 30th-anniversary commemorative booklet.

¹⁶ Prof. Charles W. W. Ng, Chair Professor of the Department, is also Vice-President of HKUST (Guangzhou) and Dean of the HKUST Fok Ying Tung Graduate School.

¹⁷ The Geotechnical Centrifuge Facility (GCF) at UST: <https://gcf.hkust.edu.hk/home>.

¹⁸ Prof. Ben Y. B. Chan, now Associate Professor of the Department, is featured in a roundtable interview entitled “Right Here, Then and Now” in this 30th-anniversary commemorative booklet.



MOE CHEUNG

Prof. Moe M. S. Cheung (張慕聖, 1945–2014) obtained his PhD in Civil Engineering from the University of Calgary (Canada). A world leader in long span bridge health monitoring technology, he made significant contribution in applying finite element and finite strip analysis to structural and bridge engineering, particularly in wind-vehicle-bridge interaction and dynamics, long-span bridge multi-excitation response, and lifecycle cost management of infrastructures. He published over 260 technical articles and three books, including *Finite Strip Analysis of Bridges*, and edited numerous international conference proceedings, as well as supervised 15 PhD and 18 master's students, and over 20 post-doctoral/visiting scholars.

Cheung joined the Department of Civil and Environmental Engineering in 2003 and served as Department Head until 2009, during which time the Department thrived and became one of the world's best. In addition to his long list of honors and accolades, he was also Founding Chairman of the Canadian Society for Civil Engineering Hong Kong Branch. Cheung retired in 2011, but remained active in research, teaching and public service. In 2012, he established the Western China Earthquake and Hazards Mitigation Research Centre (EHMRC) and became a professor of Sichuan University in Chengdu, China. He was best admired, respected and remembered for not only his remarkable achievements in structural and bridge engineering, but also his passion and devotion to UST, his students and colleagues.



Landmarks & Milestones

1991-1996

Prof. C. K. Shen as Department Head



1994

First Batch of MPhil Graduates



1993

First Batch of MSc Graduates

1991

Establishment of the Department of Civil and Structural Engineering



1994

Establishment of the Construction Materials Laboratory



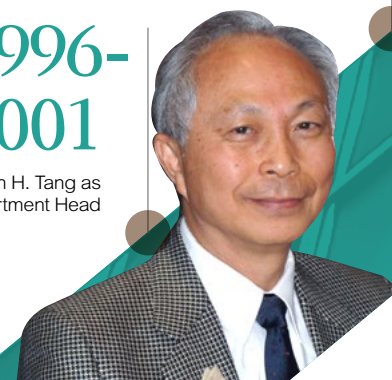
1996

First Batch of PhD Graduates



1996-2001

Prof. Wilson H. Tang as Department Head



1995

First Batch of UG Graduates



2000

Establishment of Wind/Wave Tunnel Facility



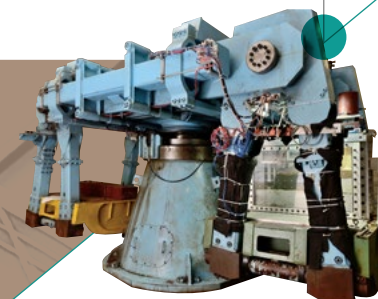
1998

Renamed as Department of Civil Engineering



2001

Establishment of Geotechnical Centrifuge Facility



2003-2009

Prof. Moe M. S. Cheung as Department Head



2008

Renamed as Department of Civil and Environmental Engineering



2015-2021

Prof. Hong K. Lo as Department Head



2012

Introduction of four-year UG Curriculum



2009-2015

Prof. Christopher K. Y. Leung as Department Head



2019

First Areas of Excellence Scheme Project by Prof. Charles Ng



2016

First Theme-based Projects by Prof. Charles Ng and Prof. Mohamed Ghidaoui



2018

Establishment of GREAT Smart Cities Institute



2021

30th Anniversary of the Establishment of the Department



2021-Present

Prof. Limin Zhang as Department Head



Taking the Helm: In Conversation with Profs. Leung and Lo

Professors Christopher Kin Ying Leung and Hong Kam Lo were the immediate past Heads of the Department of Civil and Environmental Engineering. Prof. Leung's tenure spanned from 2009 to 2015, and Prof. Lo has just finished his six-year stint (2015–2021); together, their eras constitute a significant part of the Department's thirty-year history. We sit down with them to muse and reminisce about topics ranging from civil engineering to the Department and the University.

Chair Professor
Hong Kam LO

Professor
Christopher
Kin Ying LEUNG

Leadership — More than a seat of power, it's also an office of humility

Leung and Lo were, in their own right, archetypical heads of department (HoD(s), hereafter) shouldering numerous responsibilities: managing, facilitating, mediating are just some aspects of the job... and writing: "Most of the time is spent writing letters for people — it's a lot of work, far beyond what I had imagined," says Lo, smiling. "Each year I wrote close to a hundred letters. With so much practice, now I can finish one in ten minutes."

Individually, Lo and Leung are highly accomplished: Leung, for example, was one of three SENG members to be honored by the Chinese Ministry of Education's High Education Outstanding Scientific Research Awards in 2019¹; Lo is the Director of the GREAT Smart Cities Institute and Associate Director of the HKUST-DiDi Joint Research Lab. What's truly remarkable, however, is the humanity they exhibit despite working in a decidedly algorithm- and

machine-oriented profession. To them, what truly matters are the people — their colleagues and students — and the stories behind the profiles.

"You learn about people's ways of doing things — some are very interesting," Lo says. "Some really love teaching; they explore a lot of new ways — some I would never think of myself. When I did appraisals, I'd speak with them and listen to how they'd expand their repertoire, and I'd make a mental note to myself: 'When I step down, I'll give some of these ideas a try': e.g., online platforms, MOOCs²... Learning about how people put together proposals and assemble big teams can also be very enriching."

¹ The Awards recognize leading contributions to scientific discovery and technological innovation across China.

² Massive Open Online Courses.

Throughout the conversation, Leung brims with praises for his colleagues: “You look at what the Department has achieved — not me personally, but the whole Department — they’ve developed numerous big, multi-million-dollar projects that are very difficult to complete... If you facilitate people’s work, provide them with resources and freedom to pursue their dreams, they will do great things, and we’ve seen that happen: we’ve developed blended learning courses and organized major conferences...” Leung likens his colleagues to instrumentalists in an orchestra, and the HoD to the conductor — that he’d draw such a parallel is hardly surprising, he himself being known for his virtuosity on the harmonica. “If you can play the music well, the satisfaction is tremendous,” he says.

Lo singles out the opportunity to “take on bigger ideas” as a distinct advantage of being the HoD, as more resources are at his disposal. “You can talk to the upper administration, you can convince them, you can develop big ideas and make them happen.” Of course challenges and obstacles would still abound, “...but, if things work out, it can be quite gratifying.”

When HKUST was built at the start of the 1990s, well-established academicians scouted the world for talented up-and-coming scholars to join the establishment. Fast forward to a decade or so later, those pioneers of the University were nearing retirement, while younger faculty members were somewhat apprehensive about taking over management positions. Front and center in that scenario was Leung: “I was probably a bit young to become HoD,” says Leung. “I was only willing to do it because I had support from my colleagues. A lot of them thought I’d be the right person to do it at that time —

not because I was a top researcher or top educator; it was more a personality thing: people felt comfortable working with me; they thought I could be fair to everyone, talk to everyone, discuss things, and listen to everyone.”

“The department becomes your priority,” says Leung. “The department works together as a whole — I’m not the only one who solves all the problems. I’m the middleman, the facilitator, messenger — I pass on messages to whoever can help take care of the issue; if I sit on it for too long, a whole project might get significantly delayed. That’s something I developed as HoD: I became very responsive.”

Lo’s view on being HoD also revolves around the people: “I always look at administration as service — you help people become better.” He credits his colleagues for the Department’s collective achievements, including rising to number 16 in global ranking. “I find satisfaction in seeing others succeed. If people get big projects, I’m always very happy for them. That’s the satisfaction: to see something beyond myself become very successful. That motivates me... It’s fantastic to see the Department being elevated to a very high level —



we’re ranked number one in Hong Kong now, which is a remarkable achievement.”

It cannot always be smooth-sailing though. As HoD, one of the challenges that Leung dealt with was to help the University to implement merit pay. That entailed having to liaise with his colleagues, some of whom were apprehensive about the change. “People are reasonable though — that’s important. They are willing to listen and discuss, and, at the end of the day, most people have capacity to make compromises.”

Lo says, “While you guide your colleagues you also learn from them — their different personalities, and how to work with them. Sometimes it simply boils down to this: How do you talk to everyone so they all come together to achieve some common goal without getting dragged into conflicts? That’s something I learned over time; I hadn’t realize it until I sat in the chair and asked myself, ‘What do I do now to elevate the Department?’ That’s the challenge. Good people have their own good ideas — why should they adopt your ideas? You have to find a way to convince them. You won’t get everyone to agree, but at least you get a good number of them to come onboard, to agree that it’s something

worth pursuing, and go from there... It’s very important to find synergy among the faulty so that they multiply and create bigger impact.”

To create that synergy the HoD also needs to allocate resources wisely. Individual parts may do well on their own, but synergy is what will allow the whole to be greater than the sum of its parts. “To produce synergy you need to understand what it is that your colleagues do, so you talk to them, learn more about their work — which is also very enjoyable in itself,” says Leung.

“Sometimes we’re more like a cheerleader than anything,” says Lo. “But that’s a privilege, and takes skills, and effort.”

Of all the challenges, COVID-19 probably trumps all. “It has turned a lot of my hair grey,” laments Lo. What truly sets him apart here, however, is that despite dealing with what must have been an administrative and logistical nightmare, he never loses sight of the souls that might get swept up by the immense current of turbulent times and struggle to make sense of it all. Lo shows exceptional empathy and selflessness to these “lost” souls. “It’s important to try and understand people’s trouble, so they see that we care about them,” says Lo. He goes on to relate the time he called for a cheer-up pizza party specifically intended for a couple students who were feeling estranged from the ever-disquieting world and were contemplating calling it quits. Lo invited a number of his other students along, UG and PG alike, to the party and footed the bill — it’s amazing what small gestures of kindness, like saying “Come, I’ll buy you a beer” can do. “They ate a lot ... a lot!” Lo jokes, adding: “Ultimately, it’s about giving people hope when and where there seems to be none.”

Education — A never-ending anthropological journey of discovery

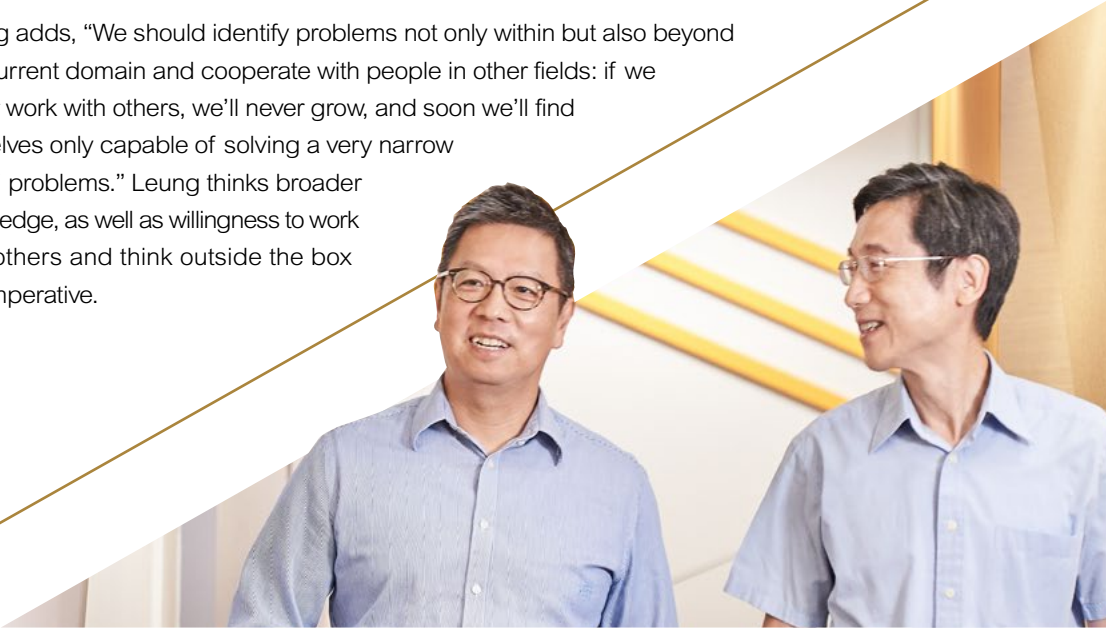
As Leung and Lo point out, civil engineering's goals can be broadly characterized as “improving people’s lives” and “providing the fundamentals of society” in accord with nature. “We must ensure that what we’re doing is, first and foremost, not damaging nature; we must try to minimize our work’s impact on the environment,” says Lo.

Regarding the problem-solving aspect of engineering, Lo offers these insights: “First we need to identify the right problems — one can solve many irrelevant problems, and things change — so it’s key to ask: What are the problems that need to be solved, that are relevant, that we can solve effectively at this time based on what we know best? Then we solve those problems. The insight in identifying the problems is primary; the technicality of actually solving them is



important but almost secondary. In Chinese, ‘knowledge’ is *xuewen/hokmun* (學問), which translates to ‘learning how to ask (the right) questions’ — that’s very important.”

Leung adds, “We should identify problems not only within but also beyond our current domain and cooperate with people in other fields: if we never work with others, we’ll never grow, and soon we’ll find ourselves only capable of solving a very narrow set of problems.” Leung thinks broader knowledge, as well as willingness to work with others and think outside the box are imperative.



“As the world becomes more complex, to solve the vast majority of important issues will take more than one person and involve other skills, tools, and emerging fields — we need to work with people in those evolving fields, and in evolving those fields.” Lo echoes this importance of keeping a broad mind and scope: “There’re a lot of grand challenges — the UN keeps track of a list of them — only some of those we can solve; others we’d better leave to other disciplines, but it’s vital to see the big picture... I hope people can appreciate a broader range of issues: sometimes art can be very important; other times, solving drinking water issues for remote villages is important.”

Lo encapsulates today’s society’s grand challenge in one question: At our current consumption rate, will there be sufficient resources left for our children? “Sustainable development is fundamentally important. It shapes the way we look at the ecosystem of civil engineering: Can we build up things using more sustainable materials? Can we use life-cycle analysis to understand that, even though we may pay a little more today, we can save a lot more in the future? We must expand our thinking process from looking only at the present and current costs to looking toward the future — that’s extremely important. We don’t just worry about how much we spend now, but also how much we will gain in the future if we do things differently now.”

“In the old days, we worried about safety; more recently we started paying attention to costs. Now, more and more, we think about sustainable development,” says Lo. “I myself don’t work in very traditional civil engineering — I’m in operations (transportation), so I also tend to think civil engineering should step outside of its current mindset. We should bring in computer scientists, electrical engineers, get IEDA³ involved, learn from them, hot topics like AI, big data... emerging areas like data analytics, life-cycle analysis, even areas in biology, math, and physics... if we can tap into those, we’ll have a bright future. We have tremendous expertise in many areas; what we need is collaborative efforts with expertise that make sense to combine with our own, to breathe new life into traditional civil engineering. That’ll be important for



the next five, ten years, and will not only take leadership but also people who can look beyond traditional work and appreciate other areas to come up with really fantastic ideas.”

Leung agrees that civil engineering has traditionally been very conservative: “Rightfully so though, because safety is always of utmost importance, but that’s no excuse for not improving or innovating. In fact, finding alternative solutions should be our future teaching philosophy. Our curriculum needs to evolve to give students the basics of diverse areas — not to necessarily make them experts in those areas; we can’t be experts in everything, but at least we should know what these things — machine learning, for example — can do for us. They don’t need to learn how to code every line of every algorithm, but they should know how to use them — what they can and cannot do, their strengths, weaknesses, limitations... This can train the next generation of civil engineers to adopt new technologies to solve problems.”

³ HKUST’s Department of Industrial Engineering and Decision Analytics: <https://ieda.ust.hk/eng/index.php>.

“Communication is another area where engineers should develop expertise in,” says Lo. “People used to join engineering because they couldn’t or didn’t like to talk or write — that’s entirely the wrong concept; sometimes even our own students have that misconception. We need people who can talk, write, and engage in debates, not just people who can calculate. Engineers need to expand their perceptions of their surroundings, of society, of their own innate abilities. They need to be aware of their impact, and be able to envision technologies that people can use and enjoy. We need people who can use both their left and right brains.”

“It used to be very difficult to find people with a full gamut of skills, but nowadays, there are so many software tools to help you,” says Leung. “With a sufficiently good concept of them, we can then invest our energy in thinking more broadly: instead of worrying about the minute details of a design — which is something that computers can help you with — we should

think about systems as a whole, and how they may impact the environment. This is the broader thinking that engineering should adopt. I hope the next generation of civil engineers will not only have the capacity for learning new things but also to bring them into civil engineering to improve our practice. HKUST has a great opportunity to do that. Space here in Hong Kong may be limited, but we do have the Guangzhou campus...”

Society — A place which humans build to serve other humans

“The most important is really the people,” Leung reiterates, referring to what makes a great university. HKUST has always aspired to finding the best people to build something great. “It wanted to be Asia’s first MIT — Prof. Woo⁴ used to tell me that, I still remember,” says Lo. “We’ve been very fortunate to hire top people from around the world, and we give them freedom to do what they think is best for their research; we trust them, 100% — we never direct them to do what we think is important; we let them decide what they can achieve best. Also, more and more we look at impact; we don’t count papers as much as some other places. We trust that if people do well, they will have impact. That’s all part of the winning formula.”

Leung: “It’s really important to let people do what interests them and what’s impactful — success will follow. A number of our faculty members were on the recent Stanford list of ‘top 2% scientists’⁵. In this University we never have to use paper count or citation count as our metric; these people simply land on that list on their own. If you are doing useful, impactful work, your citation number will be high, naturally.”

⁴ Prof. Woo Chia Wei (吳家瑋), who was Founding President of HKUST.

⁵ The list was compiled by Dr. John Ioannidis and his team, and was published early in 2021. The list contains the most cited scholars in their respective fields.



Leung also gives credit to the technical staff. “When you do experimental research, you need people with special expertise.” He says, at the Materials Characterization Preparation Facility (MCPF) and Advanced Engineering Materials Facility (AEMF) where he does research, the technical staff knows the equipment inside and out. They even advise students on how to do things better and how to exploit the lesser-known capabilities of the equipment. “That’s not always available, even at some major research universities,” says Leung. “Our forefathers have really done a great job putting the whole team together, with top faculty members and very capable support staff, enabling us to attract top students. Then everything falls into place.”

Lo is complimentary of our students: “I went on a service trip to Cambodia⁶ — we were delivering healthcare service to slums in Phnom Penh, and ran into a lot of problems with people’s medical records, and I witnessed how computer science students from our own University were such fast self-learners. When given the scenario, with the right set of skills, they were more than capable of devising their own ingenious solutions. To me, that’s what we as educators need to do — to create teachable moments to inspire students, help them look at problems *from* the right angle, *at* the right angle.”

Indeed, as UST is a gathering place for many young people, we need to recognize that a little nudge goes a long way: It’s important to give young people guidance; they have interesting, sometimes unorthodox ideas, and can have tendencies to be ephemeral and impressionable. What they need is to have role models to supplement and soften their views, their outlook, convictions, and to expand their scope and horizons.

Time flies — both Leung and Lo have spent almost three decades at HKUST. “I first learned about UST when I was a postdoc in the U.S.,” says Leung. “First I met Prof. Pin Tong⁷.” At the time Leung had already been offered a faculty position in the U.S., so he didn’t take up an offer at UST right away. The following few years, Leung would visit Hong Kong, and when in town he would visit UST to meet with Tong and Prof. Shen⁸. The more he visited, the closer he was drawn to UST. “This is really a great department,” Leung remembers thinking.

⁶ This was one of such trips organized by the HKUST SIGHT (Student Innovation for Global Health Technology, 視野無界, <https://sight.ust.hk>) program, under the specific project “one-2-one Cambodia”.

⁷ Prof. Pin Tong (董平), professor of mechanical engineering.

⁸ Prof. C. K. Shen (沈智剛), head of the Department between 1991 and 1996.

Lo’s journey to HKUST began in 1995, when he met Prof. Woo and Prof. Wilson Tang⁹ in the U.S. “I was working there at the time — life was really good.” So Lo’s initial response to joining UST was only a “maybe.” But when Tang extended another invitation six months later, Lo was moved by the earnestness of that gesture, and agreed to an interview, which finally took place in November 1995. Soon, he received the offer to join HKUST. The rest, as they say, is history.

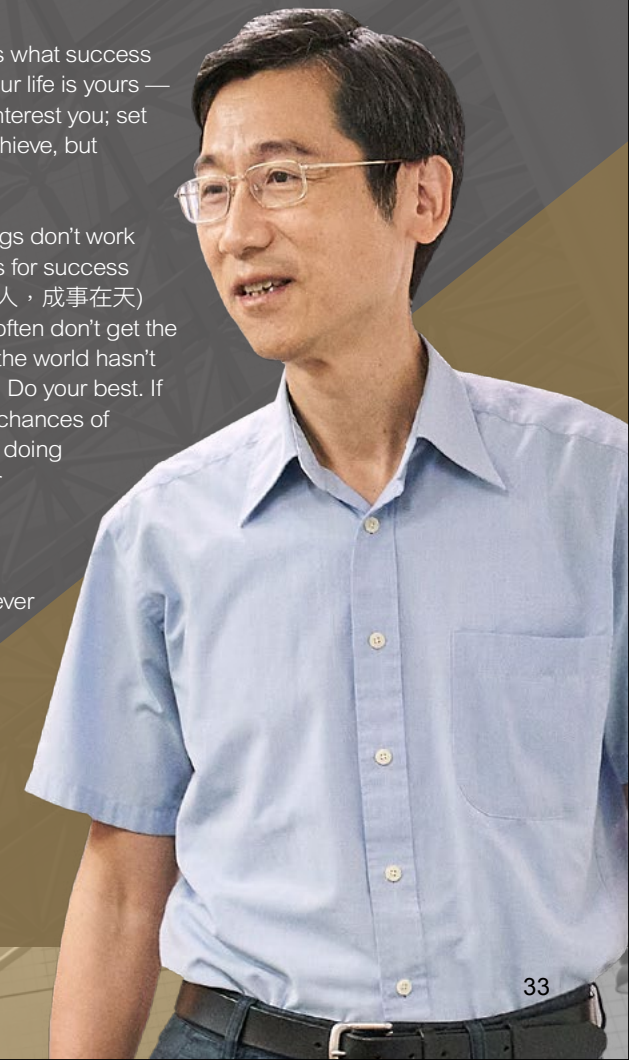
Therefore both Lo and Leung have very much been a part of the “HKUST miracle.” “I believe in miracles,” says Lo. “That’s my motto.” He describes himself as someone who always stays very positive. “Even when things look bad, I tend to be optimistic — I believe in change — It is very hard to find me very down, because I know ‘tomorrow will always be better.’ I always motivate people around me the same way: tomorrow must be better — let’s work in that direction and make sure of it.”

Leung feels that we should define for ourselves what success means, and offers these words of wisdom: “Your life is yours — so take ownership of it: plan it, do things that interest you; set your own goals, achieve what you set out to achieve, but appreciate what you have.”

“Trust yourself, and don’t complain, even if things don’t work out the way you’ve hoped, because sometimes for success to come, many elements have to align (謀事在人，成事在天) — in fact, people who are ahead of their time often don’t get the recognition they deserve, because the rest of the world hasn’t caught up with them. So be patient. Persevere. Do your best. If you do things that you actually want to do, the chances of success will be higher — because you are not doing things for anyone else; you are doing things for yourself, for your own pleasure, for your own desire, on your own motivation,” adds Leung.

Lo agrees: “Tough times never last,” — not forever anyway — “but tough people do,” he says.

⁹ Prof. Wilson H. Tang (鄧漢中), who was head of the Department, 1996-2001.



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Current Faculty

Research Groups

Department of
Civil and Environmental
Engineering, HKUST

Structural & Materials



Assistant Professor
Jishen QIU

Associate Professor
Ilias DIMITRAKOPOULOS

Professor
Christopher
Kin Ying LEUNG

Associate
Professor of
Engineering
Education
Ben Yui Bun CHAN

Assistant
Professor of
Engineering
Education
Thomas
Wei Chung HU

Professor
Chun Man CHAN

Professor
Lambros
KATAFYGIOTIS

Associate Professor
Tim Kam Tim TSE

Hydraulics



Geotechnical





Assistant Professor
Eun-Soon IM



Chair Professor
Alexis Kai Hon LAU



Chair Professor
Irene Man Chi LO



Professor
Chii SHANG



Chair Professor
Guanghao CHEN



Professor
Xiangru ZHANG

Environmental

Construction Management



Associate Professor
Xueqing ZHANG



Professor
Jack Chin Pang CHENG

Transportation

Assistant Professor
Sisi JIAN

Assistant Professor
Sen LI

Chair Professor
Hong Kam LO

Chair Professor
Hai YANG

Our Alumni

Perseverance
will bolster
the mightiest
of pillars

Right Here, Then and Now

A Generation of Home-groomed HKUST Scholars

featuring

Profs. Tim K. T. Tse, Ben Y. B. Chan, Jack C. P. Cheng, and Anthony K. Leung

Then

Few people would disagree that the essence of a university lies not within its buildings but in its people. Some thirty years ago there was a dream to build a world-class university in beautiful Clear Water Bay. Thirty years later, that dream has become a success story, embodied in a generation of exemplary UST scholars.

Civil Engineering was among the first departments established at UST, and Prof. Tim Tse¹ was among the first students: “What drew me here was, first of all, the campus. Back when I was studying A-Levels, I lived in Tseung Kwan O, and I’d come here to study in UST’s library, and, every now and then I’d take a stroll around the campus. UST is a stone’s throw from Tseung Kwan O but back then it was still a hassle to get here — that tells you how much and how long I’ve been fond of this place. I’ve always set my sights on UST.”

It was in the late ‘90s that Prof. Ben Chan chose to study civil engineering at UST: “At that time, it was uncommon for young people to ‘explore career options.’ I studied some visual art and that got me interested in architecture, and HKU was my initial pick — architecture used to be quite popular.” “Architecture was also

one of my choices — I used to see skyscrapers and dream about building one myself,” says Tim. “Back then, we couldn’t tell architecture and civil engineering apart too well. Now, of course, we know the difference: Architecture is more glamorous, but structural engineering is arguably more important — I’m not just saying that because I am a structural engineer. Architects get recognized — I. M. Pei² for example; structural engineers don’t, but buildings are able to stand because of structural engineers. Architects have some structural knowledge, but they are mostly concerned with layout, use of space, and other grandiose, sometimes even unrealistic ideas. Ultimately it takes a structural engineer to make it happen. Beijing’s Birds’ Nest (鳥巢)³ is a good example — it’s actually built by a UST graduate.”

¹ Prof. Tse was an Associate Professor of the Department, but has since been promoted to the rank of Professor, effective from July 2022.

² I. M. Pei is famed for designing the glass pyramid entrance of the Louvre in Paris and the Bank of China Tower in Hong Kong.

³ Beijing National Stadium (國家體育場), built for the 2008 Beijing Olympics.

Prof. Tim TSE

Prof. Ben CHAN

Prof. Jack CHENG

Prof. Anthony LEUNG



Prof. Jack Cheng became a civil engineering student at UST at the turn of the century. “I chose UST mainly because there was an aura of innovation here. Very early on UST had big ambitions — they even had a jingle to go with it: ‘Hong Kong U. S. T. will be the future M. I. T. ...’ That was very compelling to me. As for why I chose civil engineering: I remember CITA had a TV ad back (in the ‘80s). The ad contained the phrase ‘I had a hand in it.’ That phrase inspired me, pure and simple, making me imagine one day I would take pride in designing or building something significant.”⁴

Prof. Anthony Leung, who entered UST a few years later, recalls: “I’m pragmatic; I chose UST via a process of elimination: I like(d) mathematics and physics, so engineering was a natural choice, but what really caught my eye was geotechnical engineering’s centrifuge — I remember coming to UST for a campus tour; the student leaders very enthusiastically and proudly explained to us how that centrifuge was, at the time, Hong Kong’s one and only, and how it was operated. I found it all very interesting. There was also an emphasis on world-class research here, and, not to mention, that mesmerizing view of the sea. HKU pales in comparison.”

Not having its history as well-established as other institutions, however, meant that UST had to play catch-up. Jack remembers it making him a bit apprehensive at first: “The alumni base here wasn’t very strong — naturally; there was a general feeling that you’d only come to UST if you’d been rejected by other universities. But, over time, my outlook improved: here, the facilities were new, the prospects were truly global, and you’d enjoy tremendous freedom and abundant opportunities.”

As Tim recalls: “For a while there was a general perception that HKU, just for having been around longer, offered better job prospects. But having a longer, more established history can translate into additional baggage, and research might suffer as a result. UST prepares scholars and academics better than others, and its youth draws younger energy: There’s quite a number of younger faculty members here who are more willing and daring to try new things and to innovate. The overall atmosphere here also encourages us to go ahead without having to worry too much about whether the outcome will be proportional to the time, effort and resources invested. Being relatively young also means plenty of research possibilities. UST has always been vibrant and innovative that way — something that I already felt even during my undergraduate days, and was what prompted me to pursue graduate studies... I completed all my degrees at UST.”

“Nowhere else could give the kind of space and freedom as we have here. The fact that UST is young has really been a plus — we haven’t encountered a lot of constraints,” concurs Ben, who also obtained his PhD from UST. Anthony agrees: “Friends who attended HKU and PolyU have told me that their impression of UST is it’s more theoretical, but when I examine how our programs are designed and structured overall, I find that, as much as there is that theoretical tendency, we do make sure to include components such as industrial training to raise practicality. Our programs are comprehensive and well-designed, especially for those gearing toward research and academia — that’s also why I chose to complete my Master’s and PhD degrees here at UST.”

⁴ Construction Industry Training Authority (CITA, 建造業訓練局), predecessor of the Construction Industry Training Board (CITB, 建造業訓練委員會). The phrase was “我有份起架”. Said advertisement can be viewed via this link: <https://youtu.be/7O9auRLzSgw>

Jack, who pursued PhD studies at Stanford in the U.S., speaks about that experience: “UST prepared me well for Stanford. Stanford has a diverse community and range of personalities and styles, informed by people’s individual background, upbringing, aspirations and choices, and the ability to understand and empathize with diversity in a multi-cultural professional enterprise is one of the biggest things I take away with me from that experience. Also, there’s great networking not just at Stanford but across America, both in higher education and within my own field of construction management. I’ll admit, deciding to take up a faculty position at UST and relocating (back) to Hong Kong was a bit risky for me at the time, because unlike structural and geotechnical engineering, construction management wasn’t well-known or well-established at UST at all. I did consider joining, for example, HKU or PolyU, where the field was more established, but having had that U.S. experience, I did manage to import to UST a bit of how they do things over there — for example, how academia can collaborate with the industries and attain synergy.”

“There’s a tendency over here in East Asia to sell ourselves short, which I think is unnecessary,” says Anthony, who spent some time as a lecturer at the University of Dundee before joining the Department’s faculty. “Not wanting to come off as arrogant, because we do value our cross-border exchanges and collaborations and they have benefited us tremendously, but those benefits are mutual (and not just one-way). We’re well past the days of thinking that ‘all good things originate from the West and must be imported from the West’ — that’s archaic thinking. I tend to feel that we are as important a player on the international stage with a global outlook as everyone else. In fact, I find that, when I was in the UK, I exported parts of UST to them — over the few decades UST has come to be known as being research-rich, vibrant and competent, a reputation that now precedes us wherever we go. People out there are curious about how we do things over here, how we can be so productive and achieve so much in a short amount of time, and I’m an ambassador to demonstrate to them why UST isn’t just some legend or ‘miracle’; I show them how UST is built upon the collective hard work from a community of great people.”

Now

Nevertheless, even the greatest of institutions face challenges and have problems to solve; UST is no exception. For example, UST is reputed for giving heavy workload to students. To them, Anthony offers some insightful advice derived from the mechanics of materials: “Our training here gives us better elasticity by pushing our limit — of course we need to be mindful that we don’t go over into plasticity and cause irreversible failure/permanent damage. What UST’s training did was to toughen me up, making me a lot more ready, capable, flexible and agile to handle just about anything being thrown at me out there. When I was in the UK, I found myself much more capable of staying elastic, within my now more agile elasticity zone. With proper training, elasticity can be stretched — tough as it may be, it gives us a bigger yield surface. Second, it’s about learning how to learn, and being able to solve problems and learn new things outside of one’s comfort zone. I think there can be too much emphasis on knowledge — *what* to learn... but more often than not that shouldn’t be what we teach; we should teach students *how* to learn.”

In terms of administration, Tim suggests that the University give more consideration — invest more opportunities, resources, space — on younger faculty members and offer them management positions earlier in their careers: “Doing so cultivates innovations; some of the biggest innovations have come out of that model — Google, Tesla, you name it. Right now, as things inevitably become more established and institutionalized, we ought to be more aware and wary of spending too much time and resources on fueling and driving the engine that runs the institution, its expenses and overheads. Young minds function differently; they have quirkier, more innovative ideas that older minds won’t think of. We don’t always need chair professors to direct labs — if you wait till people are 50 or over before letting them take up director jobs, they won’t get to direct for long before they retire.”



Ben offers another perspective: “I see some disconnect between junior and senior faculty members. We find ourselves perpetuating policies and staying within protocols, gradually losing sight of why those policies and protocols were installed in the first place. No doubt, old tricks contain a great deal of old wisdom, but it needs to be communicated to the younger generation. New methodologies cannot be blindly aggregated onto old, established systems, or else space will be too tight and we’ll run out of room to maneuver. Juniors should learn from the seniors — they were the ones who built this successful place, and there’s much to learn from the senior members. At the end of the day students and staff alike are bounded within a system of merit-based metrics but that’s indispensable — any management requires checks and balances, but what we can do more is to encourage and nurture innovative thinking by incentivizing, rewarding any display of creativity and tendency to think outside the box.”

“I like the intersection of both those views,” says Anthony. “I tend not to look at opportunities as something that’s offered to people per se; what’s more important is the initiative to grab opportunities. People shouldn’t wait for or even expect opportunities or recognitions to fall upon them — so I don’t think the phrase ‘有麝自然香’⁵ fully applies here; our CV, track record, skillset, ability and competence are our own to build — sometimes it does entail leaving our comfort zone and reaching for anything that’s up for grabs. It does play a bit to personality, I suppose, and personal commitment.”

Looking Ahead

UST has, for some time, consistently topped young-university rankings, which is something that Tim welcomes and is very proud of. “... but what I would like to see,” he adds, “is that in ten, twenty years’ time, we can

emulate the MIT Innovation Initiative over at MIT⁶, a research center not driven by funding. It’d be so great to have that here at UST — completely corporate- and donor-funded, supported by those who believe in innovation and are willing to invest in it. The center would impose no boundaries, no pre-defined deliverables, nor timeline or temporal restrictions. Google Glass was conceived and prototyped like that, and GPS — these are all products of innovation without borders. Innovation is not something that’s stipulated by funding. Research ultimately isn’t learning about what has already been done or discovered. Research is about envisioning what hasn’t been thought of, getting there before everyone else does, being there first... that’s the essence of research. I’d like to see UST move more toward that direction: to have a place where we motivate ourselves toward achieving our own innovations.”

“People — faculty, and teaching, research and support staff — are the heart and soul of a truly great place,” says Jack. “Academic careers are ultra long-term, so it’s especially crucial that whoever gets recruited not only has academic prowess but also fits well into the departments and the University, as every one of them will have an impact on the overall dynamics of the place. We have a great group of people at UST.”

“Give it twenty years — UST has tremendous strength — by the time we celebrate our 50th anniversary, UST would not just be best ‘of the region,’ ‘Asia’s’ great, or one of the top ‘young’ universities, ..., nothing conditional like these. We’d have shaken off that ‘youthful’ image — we’ve had a good run with that label and enjoyed some perks along the way, but youth can only be exploited for so long. We’ll work toward making UST a truly great place, and holding our heads high alongside the Ivy League colleges, Oxbridge, Stanford, MIT, ... We have what it takes, right here at UST!”

⁵ The full phrase is “有麝自然香，何必當風颺” (Even without wind to spread it, musk is still naturally fragrant).

⁶ The MIT Innovation Initiative, formerly the “Innovation Lab”: <https://innovation.mit.edu>.



Leading by Example

Empowering Women in Civil and Environmental Engineering

featuring

Prof. Mengqian Lu and **Ir. Jenny Yeung**

Finding One's Voice

It is perhaps ironic that civil engineering, having driven human civilizations forward for as long as it has, may now have fallen behind when it comes to championing gender equality. Arguably, such may be because, as well established as civil engineering is, it has the flip side of retaining a certain level of conservatism — the notion that “engineering is a men’s profession” may have snuck its way into civil engineering. Dr. Mengqian Lu and Ir. Jenny Yeung, both alumni of HKUST’s Department of Civil and Environmental Engineering, have set out to change that status quo. These two paragons of women engineers are debunking any last inkling that engineering is a men’s playground.

Prof. Mengqian Lu, who is about to celebrate her 5th anniversary as Assistant Professor¹ in the Department of Civil and Environmental Engineering at HKUST, believes that being a competent civil engineer is, in fact, gender independent. “What it takes is brain power, hard work and dedication — men don’t have a monopoly on those. Women should be encouraged, even expected to not only voice out their opinion, but to participate substantially in decision-making, and we should all endeavor and commit to building a world where women’s ideas, work and contributions are not only valued but also given all due respect.”

Ir. Jenny Yeung feels that women may be even more able than men to pursue a career in civil engineering. “Women tend to have better communication and presentation skills,” says Jenny, “so they also have the proclivity to moderate tensions and conflicts in the workplace and during meetings.” Jenny asserts that, unlike in the old days, today’s civil engineers need even better communication skills, as they often have to face and handle situations where there is public scrutiny and even backlash. “Public support is essential for civil projects; to gain public support and trust, we need to convey many if not all aspects of our projects and plans to the masses, so that if they are going to form opinions and pass judgments, at least they are informed.” Indeed, communication is an aspect that Jenny has the inside track on — it is certainly no coincidence that, in her last post, she was the GEO’s spokesperson.

¹ Prof. Lu has since been promoted to Associate Professor, effective from July 2022. Receiving promotion to Associate Professor as well as Prof. Eun Soon IM, native of S. Korea, also professor of environmental engineering in the Department. Congratulations to both.



Prof. Mengqian LU

Ir. Jenny YEUNG

Blazing the Trail

Jenny was one of UST’s very first female civil engineering graduates. “A lot of the boys were surprised to see a female student in class, and they were apprehensive about how they would get on with me.” Civil engineering was not an obvious — let alone popular — choice for female students at that time; the career prospects it offered for women were not the best. That wasn’t enough to deter Jenny though: she wanted to pursue a career in civil engineering not only because it interested her but also because it suited her personality. Fortunately, prospects for women in civil engineering changed for the better within the few years that Jenny completed her degree at UST, so, upon graduation, she entered the construction industry as a graduate engineer, and this was when Hong Kong’s Ten Major Infrastructure Projects (十大建設計劃)² were in full swing. Ever since, civil engineering has been a steady fountain of opportunities for both male and female engineers.

Jenny recalls, with a great deal of fondness, her experience studying at UST and working in the Geotechnical Engineering Office (GEO) of the Civil Engineering and Development Department (CEDD) of the HKSAR Government. She beams as she reminisces her first site experience: at the time she was a graduate engineer in training, and on that day she was to conduct site inspections on Ting Kau Bridge (汀九橋)³, and it involved riding a boat to inspect the two ends of the bridge. “I still remember walking, on foot, between Ting Kau and Tsing Yi right after the deck of the bridge had been

As the civil engineering industry continues to advance and modernize, it is also opening up and becoming more welcoming of female engineers — this is a fact that Mengqian welcomes, but “it is also only the beginning.” Some legacy gender inequity continues to lurk around in different corners of the industry and the workplace. In fact, while most people will acknowledge that there is indeed male dominance in civil engineering and will not deny that there lingers in our society deeply engrained (mis)conceptions that engineering is a men’s profession, traditional thinking can often be difficult to supplant, and change takes time. Today, many people still think that women are too dainty to get their hands and shoes dirty, or are too frail to lift a rock. This is just some of the stereotypical thinking; there are even more bizarre ones: As Jenny recalls, women used to be barred from entering tunnel

construction sites because male contractors believed that a goddess ruled over the mountains, and if other ladies were allowed to enter an excavation site, the goddess would make the tunnel cave in and bury all the men alive — as revenge for “cheating” on her.

Such discriminatory beliefs and stereotypes with little to no basis, which used to shut many doors for women, have gradually been eliminated. Today we see female geologists and geological engineers set foot on excavation sites, for example. Jenny says that the percentage of female engineers in the GEO has now passed 20%, and anticipates having more female colleagues and engineers in the Hong Kong construction industry in the near future. “This is a step in the right direction for the construction industry.”

fully installed — the sense of satisfaction, the view, the breeze, the euphoria... all of that, I still remember...” She also remembers how excited she felt as she ascended the 200-meter bridge tower via the builders’ lift, feeling the gravity — pun intended — of being part of the team of such a mega project, soaking in every bit of that sense of pride.

For Mengqian, back when she began her undergraduate studies at UST in 2005, she wasn’t just one of few female students but also one of the earliest to have come from mainland China — she remembers feeling immensely proud of both of those aspects of her identity. “... albeit, that could at times translate into me feeling slightly lonely,” she adds, smilingly. Mengqian has vivid memories of some tough times from her undergraduate days. “But tough times toughen you up, and in the end, they will prove to be very fruitful — they certainly have for me: What I gained from UST, especially from the Final Year Project experience, was precisely what prompted me to continue on to graduate studies.”

² The Ten Major Infrastructure Projects (十大建設計劃), announced during the 2007–2008 Policy Address (HKSAR), include: the South Island Line and the Sha Tin to Central Link, the Tuen Mun–Chek Lap Kok Link and Tuen Mun Western Bypass, Hong Kong section of the Guangzhou–Shenzhen–Hong Kong Express Rail Link, Hong Kong–Zhuhai–Macao Bridge, West Kowloon Cultural District, among others.

³ Ting Kau Bridge and Approach Viaduct (汀九橋)



Mengqian's postgraduate studies culminated in earning a PhD from the prestigious Columbia University in New York City.

Mengqian says that one of most memorable highlights of her research career has to be getting her first paper published. The paper⁴ was on a study of what was at the time a new atmospheric phenomenon, called “atmospheric river” — a concentrated trail of water content floating in the sky. The paper explored and detailed a novel approach stemming from the “atmospheric river” concept to predict record-breaking floods in Western Europe. That work was one of the featured contributions of 2013 in the journal *Water Resources Research*⁵, and the American Geophysical Union put her work in their Research Spotlight as one that “could open the door for improved flood prediction.” Mengqian believes that further studies on atmospheric rivers will play an important role in understanding the water cycle on a global scale, and, since joining HKUST, she has continued to lead her research team to pioneer that research area, developing East Asia's first atmospheric river tracking algorithm and establishing a big data database that collects features that describe these “rivers in the sky.”

Having now firmly established a career in research and academia, Mengqian feels compelled to find other talented female students and recruit them to the School of Engineering. She now very actively participates in interviewing prospective students and organizing events for the Women in Science and Engineering (WISE) club. Through all that efforts, she hopes to show herself as a living example of how one can follow her heart, work hard, and enjoy the life that she builds for herself, and, with that, Mengqian wants to motivate many more (female) students to pursue their own dreams.

Ultimately, for both Mengqian and Jenny, what their respective remarkable careers have shown is that it takes perseverance and hard work to build one's own success. What they have also proven is that not only can women be immensely competent engineers, they also fare very well in leadership roles.

Living in the Moment

A typical day for Mengqian consists of holding discussions with students, working on research projects, teaching classes, and attending meetings — a healthy mix that she enjoys, particularly the research and teaching aspects. She says she loves being able to flex her intellectual muscles during class and share with students her passion in making scientific discoveries by connecting the classroom and the research lab. “Another perk of being a professor at UST is free access to that breath-taking view of the Saikung Sea — you can't put a price on that,” she adds. Mainly, however, what Mengqian enjoys and values the most is the fact that she can use her time whichever way that suits her best. “Here at UST I am able to strike a work-life balance, and to simply enjoy every day.”

Mengqian also derives a great deal of joy and satisfaction from supervising research students, especially being there to witness each student's growth, as reflected in the quality of the papers they produce. “Papers reveal quite a lot about each individual's way of thinking, perspective, personality, even eccentricity,” she says. “I take great pride in my students and their work just as they are, achievements, KPIs, awards aside.”

⁴ Lu, M. et al. (2013), “Precipitation predictability associated with tropical moisture exports and circulation patterns for a major flood in France in 1995,” *Water Resources Research*, 49(10), 6381–6392, doi:10.1002/wrcr.20512

⁵ Montanari, A. (2014), “Water Resources Research in 2013,” *Water Resources Research*, 50(4), 2787–2794, doi:10.1002/2014WR015648



Having devoted more than 5 years to studying hydro-meteorological extremes, Mengqian thinks that time is now ripe for expanding her research scope. She has been inspired by water security threats arising from population growth and climate change. In particular, she has been drawn to water sustainability issues in the Greater Bay Area. To facilitate this new research pursuit in climate-informed sustainable and robust water infrastructure planning, she gives herself a new challenge — to collaborate with researchers across multiple fields in a concerted effort to look for solutions to mitigate any mismatches between water demand and supply.

For Jenny, as GEO's Chief Geotechnical Engineer, she is in charge of exercising geotechnical control over the design and construction of public and private development projects in the eastern parts of Kowloon and the New Territories. In addition to overseeing slope safety in these areas, she also doubles as an emergency manager who is responsible for administering the GEO's emergency system, offering geotechnical advice all year round to relevant parties in the event of a landslide. This means that Jenny has to be on call round the clock. “But that's just the nature of the job — landslides come unannounced, but, regardless, it is our job to safeguard the public from such hazards.” Because of this, Jenny thinks that parents, especially mothers, who are experienced in providing round-the-clock care for babies and toddlers may be best suited for emergency response jobs in engineering. From having to take care of newborns, parents, especially mothers, inadvertently train

themselves to become light sleepers and to be on constant alert for emergencies.

This emergency-response aspect of Jenny's work does make it somewhat alarmist, but that is all the more reason why slope safety should be treated as a proactive, precautionary matter. “We tend to worry about landslides only on rainy days; when conditions are fine, most of us tend to forget, but rocks can roll down the hill on sunny days too. More importantly, while heavy rainfalls and landslides are correlated — that's a fact no one would deny — it doesn't mean that when the sun is out we can afford to be complacent — preventative measures must be put in place before disasters strike. We need to examine and reinforce slopes all the time. If we bury our heads in the sand and allow ourselves to be unprepared, when the rain comes — even a small but persistent one — it will already be too late.” The GEO in fact has long-term commitments to ensuring and enhancing slope safety in Hong Kong, and Jenny credits support from the government, members of the Legislative Council, as well as the general public for facilitating the success of the GEO's work and projects. “In fact, one of the most exciting and rewarding aspects of being a civil engineer is to know that you are in a position to improve the quality of life and safety of the citizens,” says Jenny.

Passing on the Wisdom

Jenny : Be confident. Don't underestimate yourself, especially in comparison with your male counterparts. Join relevant societies and groups to gain more exposure to the industry. Expand your horizons!

Mengqian : Share your thoughts to elicit feedback and earn respect, which would empower you to improve and perform better when opportunities come around. Be content, stay open-minded and stay positive. Look toward striking a balance. Take small steps until you reach your goal.



Finding Alternative Callings Alumni in Other Industries

featuring
**Ms. Claudia Sin and
Mr. Tanmay Sharma**

Going Off Track

It might be an easy, obvious choice for civil engineering graduates to pursue a career within their own field, but, arguably, an education in (civil) engineering prepares them for so much more than just beams and columns. For example, engineering instills in them a sense of professionalism that is also applicable to other fields. In fact, as Claudia Sin and Tanmay Sharma, both civil engineering alumni from HKUST, have found, their engineering training doesn't just apply to alternative professions, it actually helps them excel and succeed.

The multi-talented Claudia believes that one's career choice does not have to be congruent with his or her undergraduate studies. Claudia is a pilot, a freelance artist, and she owns a shop that sells drinks. "Life has a funny way of unfolding itself. Whatever your fate — your calling — may be, you learn to deal with it, and it's best done with a sense of humor. People often don't know what life may have in store for them while they are still studying in university; many people can't foresee what they will eventually become, what journeys they will end up embarking upon. The fact that I have become a pilot is a good illustration, but being a pilot also doesn't mean that I throw my civil engineering training out the window. Many things in life are a lot more related and connected than we realize..."

Tanmay Sharma, Director of Community Concepts Hong Kong, shares a similar view. University education and curricular structures go through a lot of changes over time, and as it happens, opportunities become more varied and more available for students and graduates. Tanmay thinks that it is a good idea to try out different options. "There are many opportunities and resources available at HKUST — we should take advantage of them." Tanmay points out that while HKUST is famous for its research strength, more and more there is now emphasis on experiential learning, and design courses have been added into the curricular mix. During his time in UST, Tanmay participated in numerous entrepreneurship activities and competitions, and upon graduating with a dual degree in civil engineering and business management, he worked in an asset management firm as an IT analyst, before deciding to start his own restaurant business.

Ms. Claudia SIN



Mr. Tanmay SHARMA



Exploring Opportunities

Claudia has fond memories of HKUST's rich academic atmosphere — she remembers the library to often be full of people working on assignments and projects, rehearsing for presentations or studying for an exam. Claudia says she wasn't at the top of the class, but life doesn't end because you don't get a 4.0 GPA. Life has other fortunes to offer, and hers has been to find an alternative career that she is passionate about.

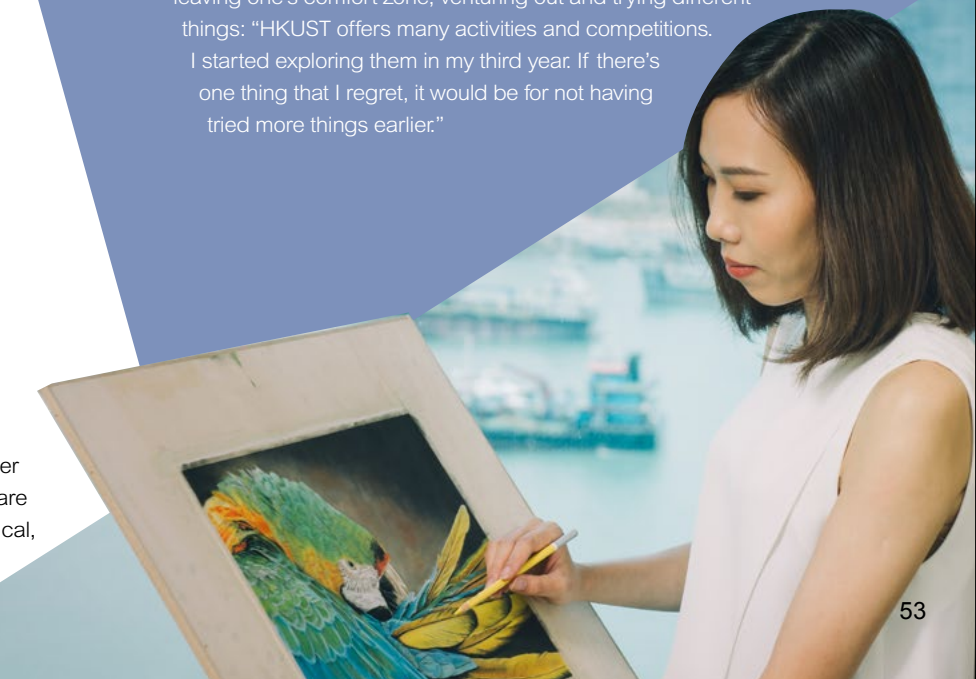
Ever since a very young age, Claudia has been interested in aviation. She joined the Air Cadet Corps in year 1 and that opened up a whole new world for her. The Air Cadet Corps offered a variety of classes and activities through which she learned about many aspects of aviation, and over time she developed an interest in pursuing a career in aviation. "If it wasn't for the Air Cadet Corps at HKUST, I would have just become a 'conventional' civil engineer like many others." She then received a scholarship from the Air Cadet Corps to go to Australia during the summer of year 2 and study to become a pilot, subsequently obtaining a pilot license. After graduating from civil engineering at UST, she worked first as a flight dispatcher, then as an air traffic controller, before finally landing a job with Cathay Dragon as a pilot.

Claudia attributes her analytical, critical thinking and problem-solving skills to her university and civil engineering education. "People who study engineering are different from others that study, say, business: Engineers have a more logical, two-dimensional thinking process.

They read and interpret complicated data better, they tend to work more systematically and meticulously, and they can analyze situations better — they are suitable for piloting." Many of her pilot colleagues come from a background of aviation studies or engineering. "A number of the project-based, experiential learning courses offered at UST have given me very important skills, which are not only practical but are applicable across a wide range of professions. Being a pilot, when you're way up in the sky, having these skills or not can be the difference between life and death."

Curiosity was partially responsible for getting Tanmay into civil engineering. More importantly, it was because he "wanted to do something professional that will contribute to society." As a student of the Dual Degree Program of Civil Engineering and General Business Management, he gained exposure to both worlds. However, at the time when he graduated, the prospects of civil engineering were not great; even some of the top graduates had to wait a while to secure a job, so he instead decided to be an IT analyst in an asset management firm.

Like Claudia, Tanmay believes that the skills he gained from civil engineering will never go to waste even if he chooses to work in a field other than engineering. "I studied business management, but it's skills I learned from engineering that allow me to excel at understanding data and analysis in the asset management company." Tanmay thinks that because engineering students are more used to dealing with complicated theories and mathematics, they tend to find the job of an analyst easier than their business major counterparts. He also emphasizes the importance of leaving one's comfort zone, venturing out and trying different things: "HKUST offers many activities and competitions. I started exploring them in my third year. If there's one thing that I regret, it would be for not having tried more things earlier."



Being Ready for an Ever-Changing World

We live in a dynamic world. The civil engineering profession evolves, as does the rest of the world. “You can never be sure what will happen to your business next year,” says Tanmay.

Cathay Dragon's demise was tough for Claudia. She used to think she would be a pilot for 40 years until retirement. “It's difficult for pilots to find another job, especially those who have already worked for ten years like me. Pilots tend not to be hired outside of their field, as other professions don't understand too well what it takes to be a pilot.” In 2020, her piloting career came to an abrupt end. The ensuing months were difficult; luckily she had another childhood dream to fall back on — drawing. She began painting animals, and, with the support of many people, she quickly established it as an interim, freelance “career”. At the same time, she had enough flexibility in her schedule to explore the possibility of starting a small business as well. Soon after, she and her husband started a business selling drinks. Claudia attributes the flexibility and resourcefulness that she has had to rely on to get through the challenging past couple years to her engineering training.

Fortunately, the business environment in Hong Kong began to recover. Nine months after Cathay Dragon's untimely, abrupt cease of operation, Claudia found herself employed as a pilot again, this time with Cathay Pacific. “Even during my nine-month ‘break’ following the demise of Cathay Dragon, I always held onto the belief that my aviation career wasn't over yet, that I would one day pilot an airplane again. Meanwhile, I am also grateful for the unexpected opportunity to explore other facets — fulfilling my other dream of being an artist, and owning a small business — those opportunities would not have come to me if it wasn't for what happened to Cathay Dragon. Turns out, everything that happened in the past couple of years was a blessing in disguise.”

For Tanmay, a career in asset management wasn't fulfilling enough — he was looking for something else. “A ‘regular’ 9-to-6 job can only get you so far,” he says. Thinking that youth was on his side, and that he had nothing else to lose, he decided to venture into a different area — to be a restaurateur. Eventually, together with his brother, he opened a seaside restaurant — the first of four — in Tseung Kwan O. As Tanmay explains, his reason to become a business owner was that, as he puts it, “A house can't get you a business but a business can get you a house.” As for the decision to get into the food industry, the reason was one of nostalgia: during his university days, Tanmay worked part-time at a restaurant to pay off his tuition.

The catering industry was particularly hard hit during the 2020–2021 economic downturn. This however has not deterred Tanmay. Instead, he sees it as an opportunity to do more. He finds that a lot of the skills that he picked up from civil engineering are also applicable to the restaurant business and can help him get through tough times. “Engineering's analytical skills for example allow me to see through a lot of surfaces and understand what's really happening at the core — in other words, what's the crux of any problem which I might be facing.” With such a skillset, Tanmay soon expanded his business to four restaurants, and established Community Concepts Hong Kong.

The world today can change very quickly and often in ways that take people by surprise. Tanmay says, back then, he was told that every civil engineering graduate had a minimum of two job offers, so he forwent computer science for civil engineering under that pretense of job guarantee. By the time he graduated, the industry had changed a lot, to the point that he chose to work in finance instead. Tanmay thinks that studying civil engineering is no longer only about civil engineering but involves a lot more — communication, analytical, problem-solving and other skills. These skills are very valuable to any career development. In fact, he thinks that people should be careful not to put too much emphasis on field-specific technical knowledge in university and neglect those portable skills. These skills will come in handy in many situations, including in “off-track” careers.



Final Word of Wisdom

Claudia :

“Don't choose your major based on job prospects — at least not entirely — as industries and the economy fluctuate all the time, and, whatever the industry, jobs are never fully guaranteed. Explore, find and choose something that (truly) interests you, something that you will enjoy doing over the long term, something you have or will find passion in. That way, at the very least, even if an economic downturn hits, there's something to motivate you through tough times. Careers don't need to be the same as one's studies.”

“HKUST offers a lot of resources. In this digital era, most things are just a few clicks away. So go explore, join teams and societies — even those you've never thought about or are apprehensive about joining, like the Hong Kong Air Cadet Corps — participate in competitions, learn a new language, go on exchange... Make good use of your time in university — it's probably the freest you'll ever be in life. Try new stuff; you may not get the chance later!”

Tanmay :

“Reflect and improve, always. Take advantage of being in university, especially HKUST, especially in civil engineering. Many of our students think that our professors aren't approachable. That's why they don't go and talk to them and get advice. In reality, most professors are kind and are willing to give advice, so make sure you talk to them and improve.”

“Explore. If I could go back and do it all over again, one thing I'll definitely do would be to explore more. It's good to focus (on your major); it keeps you centered, but there's so much more out there. Many students are too fixated on their GPA — the truth is, after you work for a few years, GPA matters very little. Find your passion — although it might be very difficult to — but if you don't explore, you'll miss out on many things that you could develop passion for, so don't stop looking and trying different things.”



Hope and faith are civilizations' most enduring building blocks

A Taste of Life @ UST — Student Stories

HKUST is a lot more than just a place for studying and looking for a job. To me, HKUST has been the perfect platform to explore different opportunities, build networks and develop myself.

I remember I nearly gave my mum a heart attack in year 1 when I decided to go to Turkey alone for an exchange program — it was a global awareness summer camp, and I was a student mentor in a Turkish high school. I made friends with youngsters from over 20 countries including Algeria, Kazakhstan and Azerbaijan. I treasured the international exposure that I gained from Turkey very much, so much so that I applied for an exchange program to get a taste of studying in the UK in year 3, believing that putting myself in a different environment would stimulate personal growth.

My volleyball teammates have accompanied me through my university life, sharing both joy and tears together. Teamwork and leadership skills gained from the team will be useful throughout my life.

In the Wu Zhi Qiao (Bridge to China) team, I learned practical project management and engineering skills through designing, planning and implementing civil projects in rural villages in China. The most unforgettable part was not having access to shower facilities for ten days in a village. The smiles in the children, however, made the experience all worth it.

The four years at HKUST have truly broadened my horizons. The international exposure has inspired me to explore a career in aviation, so I began working as a graduate civil engineer at the Airport Authority Hong Kong, participating in projects related to the third runway and three-runway system. Now I am an airline pilot, helping connect the world together.

HO Yeuk Lam Isabel
Class of 2018



I have been participating in artistic cycling since 2009. I remember seeing, when I was 7, someone performing on a unicycle and doing difficult tricks. I became so curious about this amazing yet challenging sport and asked my parents if I could try it. This is how my cycling journey started. In primary 5, I was selected to be a member of Hong Kong's artistic cycling team. We practiced three times a week after school in Chai Wan, which took me three hours to commute to and from. Although it was time-consuming, the fun and challenge of the sport made it all worth it. I participated in the 2019 UCI Indoor Cycling World Championships in Basel, Switzerland. It was a very valuable experience despite the fact that I didn't win a medal.

During my HKDSE study leave, I considered giving up cycling because it was hard to balance my studies with cycling. Later when all the sports venues were closed due to the pandemic, I could not practice with my partners, but we encouraged each other to continue our separate practice. This made me realize that encouragement from others is very important, in team sports as well as in other aspects, even in school. I was interested in civil engineering in my first year but I was apprehensive about making it my major. Fortunately, some senior students encouraged me and gave me a lot of information, and I became more confident in pursuing civil engineering.

LAM Cheuk Yu
Year 2 Undergraduate Student



I completed both undergraduate and postgraduate studies at HKUST, and I had a wonderful time there, not just academically but also in sports. Back when I was in secondary school, I used to walk along Shing Mun River's promenades, and I often watched and admired the rowers there — rowers at dusk was an especially beautiful picture. This inspired me to get into rowing, and, thanks to the variety of activities offered at HKUST, I joined the rowing team during orientation week. My varsity athletic life thus began.

For three years — which was the entire duration of my undergraduate life — I remained a member of the UST rowing team, and that experience has taught me a lot. What the professors have taught me is a great deal of knowledge and critical thinking, but what the rowing team has given me is the value of teamwork and team spirit, physical strength, and mental toughness, among many things. After I graduated, I completed the 100 km Oxfam Trailwalker race twice, as well as two full marathons and a Half Ironman (in Taitung city), and I am sure that, had I not joined the rowing team at UST, not only would I not have had exercised regularly, I wouldn't have had the endurance or perseverance to pull through those tough events. Now, we ex-members of the rowing team still get together on occasion, and, this year, we have been rowing in Victoria Harbour once a week. I hope, especially with the HKUST Water Sports Center, more students, faculty and staff members, and alumni will give rowing a try, and perhaps gain a different appreciation for the beautiful sea next to HKUST.

LO Kai Fung
Class of 2003



I remember watching a video of a model of a building being tested on a shake table and it survived the test. I became curious as to why the structure could survive under such intense motion. Some time after, I heard that there was an international seismic competition called IDEERS, held in Taipei every year. I decided to form a team to participate. We first won HKUST's internal competition for the right to represent the University at IDEERS2015.

In the competition, we were required to build a model of a building with minimal material cost but could withstand up to 800 Gal of seismic loading (simulating extreme earthquake conditions). We tried our best to apply what we had learned from our professors but also did a lot of additional research to build models and experiment with them. After numerous failures, we realized that flexibility must be given to structural stiffness when designing a structure to withstand seismic forces. This is completely different from the static theories we had learned in school. When developing an engineering design, we need to understand the assumptions and principles behind the theories and decide whether it is practical to apply them. Otherwise, the design could be completely wrong and can lead to catastrophic consequences. In the end, thanks to the team's effort and support from the Department, we were crowned champions of the competition.

I enjoyed my university life very much. Through studying at HKUST and living in the UG Hall, I made a lot of new friends. Together we would attend lectures and participate in activities and competitions such as the softball team, dance team and the dodgeball competition. Although I am now working as a civil engineer in the industry, I still remember and treasure these memories from my undergraduate studies very much.

CHOI Siu Kwan Peter

Class of 2016



SZE Hiu Lee Lilian

Class of 2018

I remember attending a sharing session hosted by HKUST's Wu Zhi Qiao (Bridge to China) team, where I learned that the team's aim was to build footbridges and organize community projects in rural Chinese villages. The team members would sojourn in a particular village and communicate with the local villagers to understand their needs and bring them the most feasible and appropriate solutions for their problems. I was touched by the stories that the team shared, and wanted to become a part of the team.

By joining the team, I got involved in different stages — from planning to final designs — of multiple projects that took place in Yunnan, Chongqing and Guizhou. Apart from building footbridges, we also provided community service such as offering educational workshops, installing LED light fixtures and building public toilet facilities. In addition, we learned to manage logistics such as transportation, accommodations and food distribution. Joining Wu Zhi Qiao has given me a lot of hands-on experience in managing volunteer work projects and carrying out constructions.

I also had the opportunity to work and cooperate with other student teams from both Hong Kong and the mainland, working together to complete projects and learning from each other. I found myself improving throughout the process. We didn't just build footbridges for the villagers, we built bridges — lifelong friendships, team spirit, emotional connections — among ourselves the participants. It was indeed an unforgettable life experience for me.



LEUNG Tin Long

Year 4 Undergraduate Student

I have long been drawn to the development of artificial intelligence (AI) and its applications in civil engineering. In year 3, I joined the Data-Enabled Scalable Research Laboratory (DESRLab) out of interest and got a taste of AI in practice. To further hone my skills, I participated in an AI-based project under a one-year placement program offered by the Hong Kong Observatory (HKO). I was interested in the huge potential for AI given the large volume of data collected by HKO, and decided to join, even though it might affect my studies.

During the placement, I took on the role of a machine learning (ML) engineer and helped improve two existing solutions: radar nowcasting and visibility estimation. First, I conducted literature review and wrote Python code to process datasets and run ML models. But, by then, the COVID pandemic was in full swing, repeatedly delaying the shipping of the computing infrastructure. Since it would be inefficient to run the models without the infrastructure, I instead focused on improving the code, eventually creating a set of tools for automating the ML workflow to make the AI reproducible and maintainable. This turned out to be a good move: in the end, the computing infrastructure arrived too late for me to personally evaluate the relevant models, but other HKO engineers could carry on with my work, so eventually it will contribute to the greater good of Hong Kong society. The overall experience and complicated series of events have shown me the importance of always drawing up contingency plans to move forward, especially in the face of difficulties.

In retrospect, the hands-on experience at HKO was invaluable in familiarizing me with the ML workflow. Thanks to this unique experience, I have since become better equipped to develop the next generation of civil engineering applications with AI.

I started Scouting when I was in secondary school and came across an activity called pioneering — using basic and advanced Scouting skills to get things done and survive in the outdoors — and I participated in building large structures like bridges and towers using bamboo and ropes. It was there that I first found my interest in building structures.

After HKDSE, I was admitted to the School of Engineering at HKUST, and during my undergraduate years, I took part in the Venture Scout Training Scheme, which provided me with more rigorous and challenging training as well as activities in line with the contemporary trend. Through participating in the scheme, I developed autonomy and discovered both personal and team potential. The diverse activities such as pioneering, camping and expeditions also helped me understand the importance of team building, the art of decision-making and how to become a strong leader. These essential skills not only enable me to better adapt to any new environment, but have also helped me meet many new friends throughout my university life.

In year 2, I was President of UST's American Society of Civil Engineers International Student Group. I led other committee members in organizing various activities to promote civil engineering to university students. The leadership skills that I learned from Scouting proved to be crucial as I served on the committee.

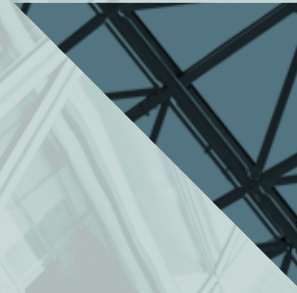
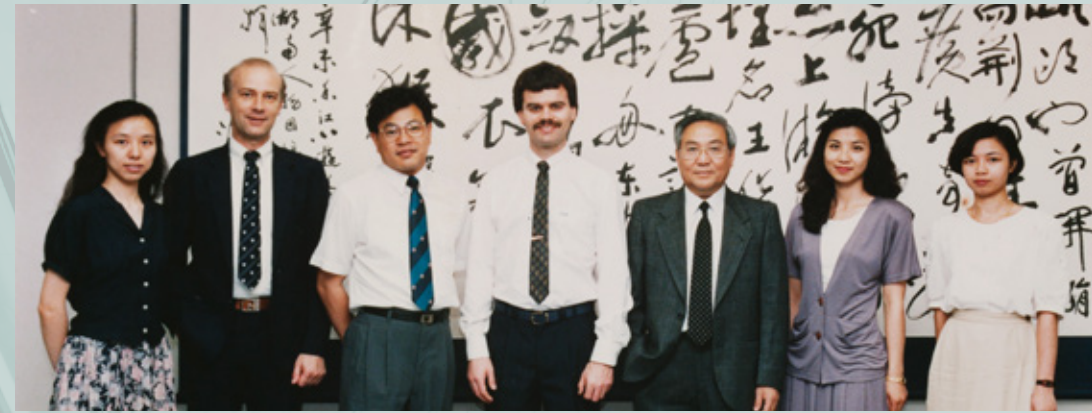
I completed the Venture Scout Training Scheme in year 3 and received the Dragon Scout Award, the highest honor in Scouting. Overall Scouting has been a process of growth and transition from adolescence to adulthood, and has given me a lot of experience and holistic development that parallel my university education.

CHIU Leung Kam Alan

Class of 2017



From the Archives



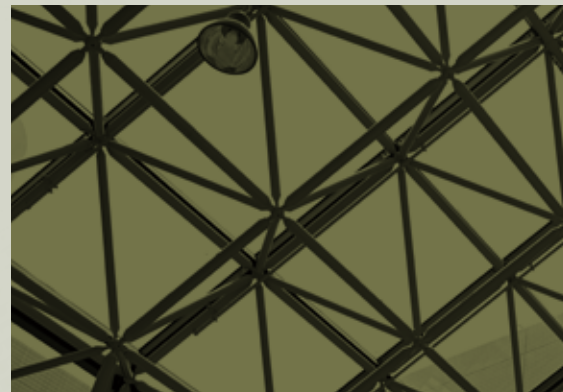
In Pictures 1991 to 1995

In Pictures 1996 to 2000

Civil Engineering , 2000
Hong Kong University of Science & Technology



Civil and Structural Engineering , 1998
The Hong Kong University of Science & Technology

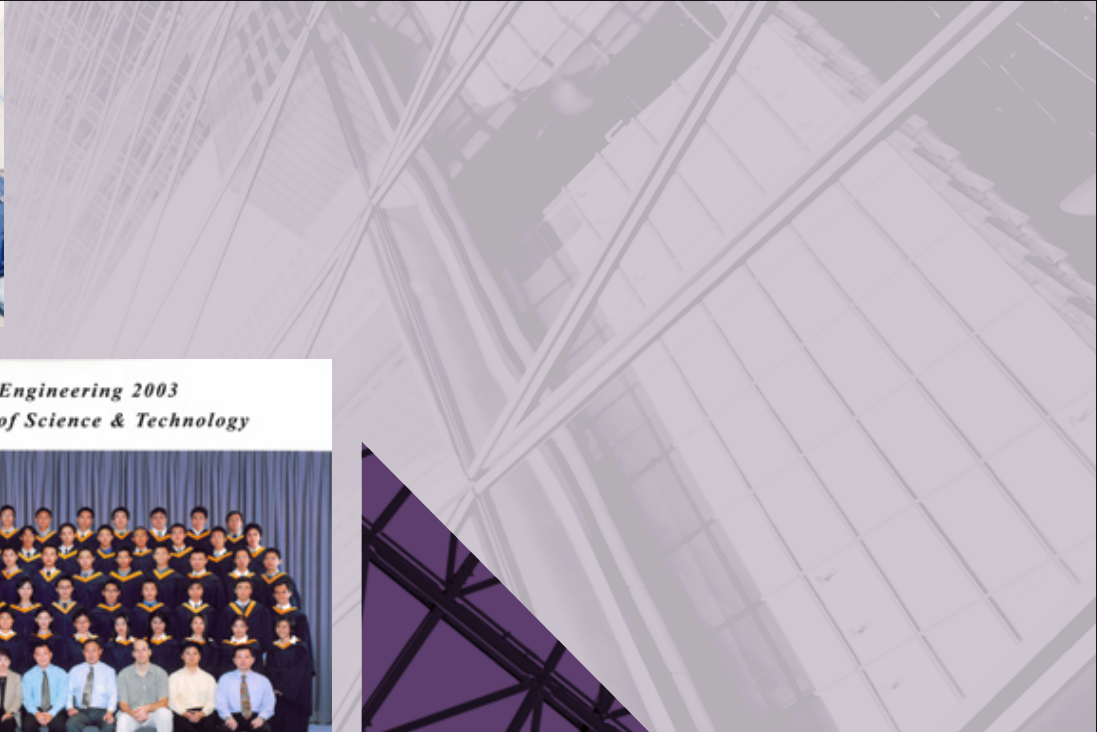
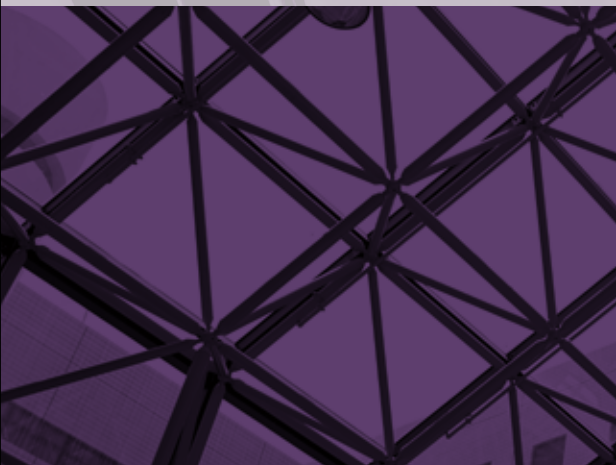


Civil Engineering , 1999
Hong Kong University of Science & Technology

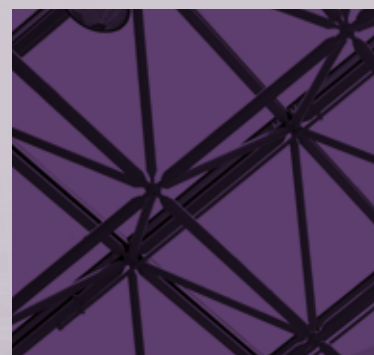


Class of 1996 • Civil and Structural Engineering
The Hong Kong University of Science & Technology

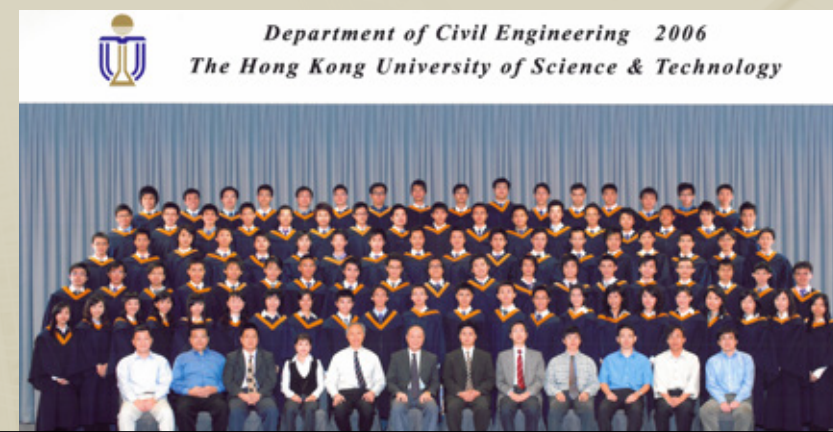
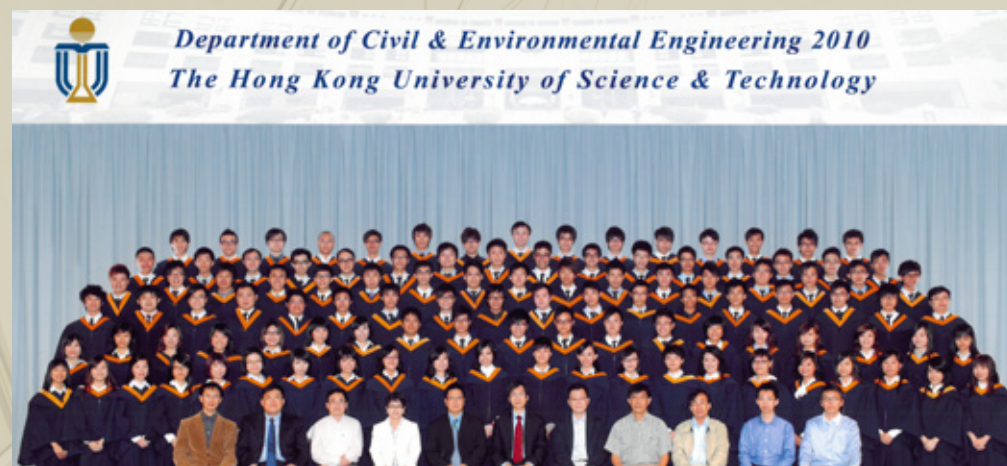


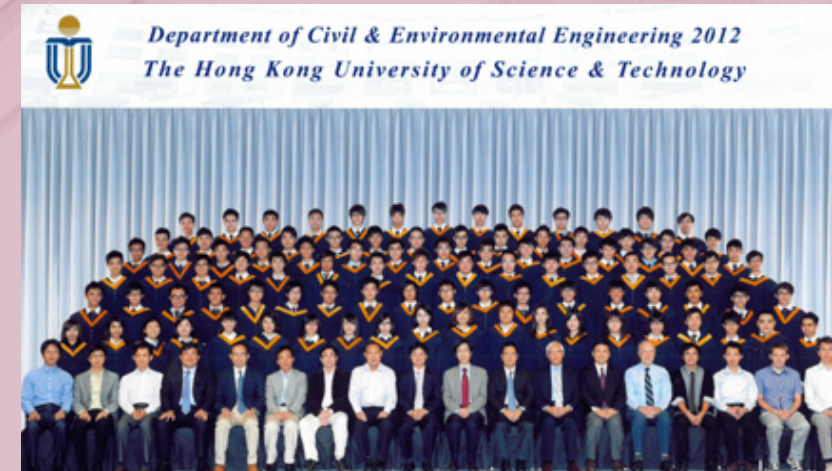


In Pictures 2001 to 2005

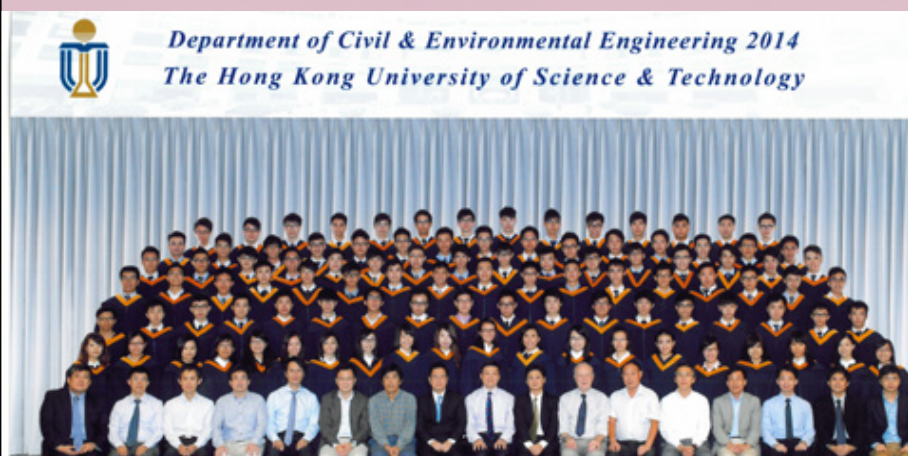
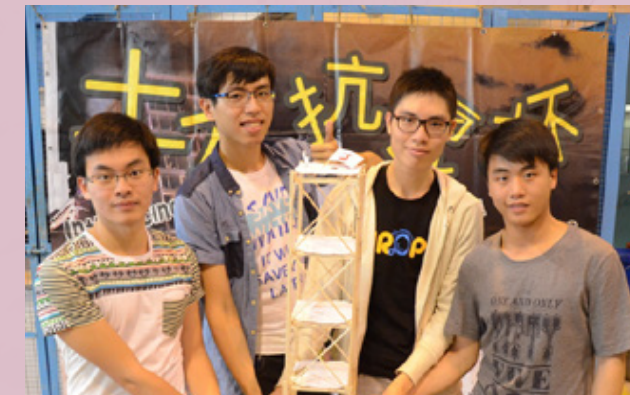


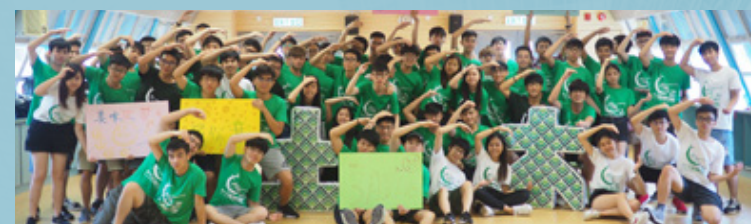
In Pictures 2006 to 2010





In Pictures 2011 to 2015





In Pictures 2016 to 2021



Empathy builds society's strongest bridges



HKUST CIVIL AND ENVIRONMENTAL ENGINEERING POST-GRADUATES AND SCHOLARS ASSOCIATION

Founding the HKUST Civil and Environmental Engineering Post-graduates and Scholars Association (HKUST CEE PGSA) had been a long-held wish of Professor Paul Chang. Therefore, in late 2009, Derrick Leung (1st CEE MPhil graduate), Morgan Yang (1st CEE PhD graduate), HY Ming and other senior CEE alumni came together to realize that wish, and on March 14, 2010, the HKUST CEE PGSA was established at Shenzhen University.

The association is mandated to build and maintain a platform where alumni can stay connected, ties can be strengthened, exchange opportunities created, and collaborations facilitated. During the Department's 20th, 25th and 30th anniversaries, the CEE PGSA committee was particularly involved in co-hosting events.

The CEE PGSA has held annual meetings in several cities, from Shenzhen, Guangzhou and Nanjing to Xi'an, Beijing and more.



Apart from the annual meetings and academic activities, local leisure events are organized for postgraduate students and alumni in Hong Kong. One such event was the BBQ gathering that took place in Wan Chai in 2018.



Eighth meeting (2018) at Xian University of Technology

HKUST CIVIL AND ENVIRONMENTAL ENGINEERING ALUMNI ASSOCIATION

Since being established in 1994, the HKUST Civil and Environmental Engineering Alumni Association (CEEAA) has kindled not only a sense of belonging but also pride among alumni and friends, bringing everyone and the Department closer together. The CEEAA continues to serve as a resource as well as a source of support for its members.



Smart Infrastructure Conference 2021

Part of the Smart Cities Conference Series, Smart Infrastructure Conference 2021, co-organized by HKUST's Department of Civil and Environment Engineering, the Civil and Environmental Engineering Alumni Association, the HKUST GREAT Smart Cities Institute, the Smart City Consortium, and the Hong Kong Institution of Engineers, took place on May 13–14, 2021 at HKUST (complete with webinars). The conference showcased and forecasted such aspects of smart city development as connectedness, sustainability, and data analytics, offering an opportunity for participants to review the Greater Bay Area (GBA)'s utilization of cutting-edge smart applications, and to examine how technologies have and will continue to shape our cities, making them more connected and sustainable. The conference also featured discussions on how current technologies may be further incorporated into the GBA's 9+2 cities to foster synergic development across the area and to prevent individual cities from slipping into their own development silos.

The conference was particularly delighted to welcome Ir. LAM Sai Hung (JP), then Permanent Secretary for Development (Works) of the Development Bureau of the HKSAR, and Ir. Dr. LO Wai-kwok (SBS, MH, JP), member of the Legislative Council (Engineering functional constituency) as Guest of Honour and Conference Advisor, respectively. Some 18 keynote presentations and 32 technical presentations delivered by senior government officials, corporate executives and academics from Hong Kong, the mainland as well as from overseas were featured over the two days of the conference.

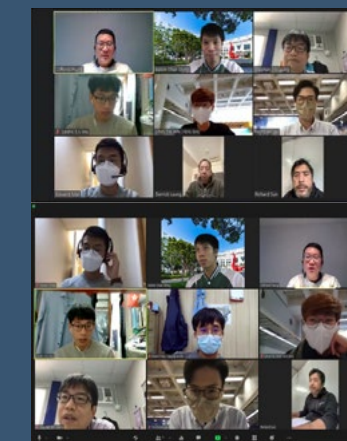


CEEAA 30th Anniversary Dinner 2021 cum Outstanding Alumni Award Ceremony

The 30th Anniversary dinner was held on November 19, 2021 at Royal Plaza Hotel as a highlight event celebrating the Department's three-decade journey of becoming a world-renowned hub of top-notch scholars and teaching and research facilities. Over 300 guests attended the dinner.

Today, alumni of the Department spread across the world, serving and contributing to society professionally and in research. Those who were at the gala dinner were offered a chance to reminisce, share their stories, rekindle friendships and expand their personal and professional networks.

Presented also at the dinner were the Outstanding Alumni Awards to Prof. Samir Kumar Khanal, Prof. Wai Yuen Szeto and Ir. Jenny Yeung. The CEEAA and the Department invite everyone to join them in commending the three awardees for their most distinguished achievements in civil and environmental engineering.



Professional Examination Preparation Workshops and Other Support for Current Students

Workshops continue to be offered to young alumni preparing for professional examinations administered by the Hong Kong Institution of Engineers and the Institution of Civil Engineers (UK). For example, in February, 2022, the Association held an online workshop that offered participants some help and advice on writing skills and interview techniques. The CEEAA also provides support and guidance to students who are planning their career, offering seminars on job searching as well as workshops on CV writing.

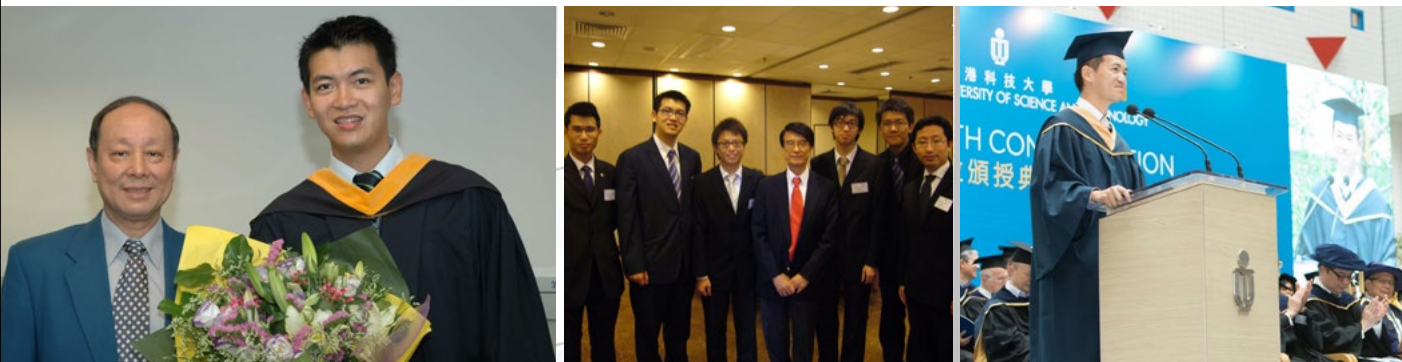
Terry Tsang is known by many as the Founder and CEO of Madhead Limited. What many people might not know, however, is that his road to entrepreneurship was anything but straightforward. It had many twists and turns, and a lot of obstacles to overcome.

Back when Terry was about to complete his HKALE, he did not have access to as much information as we do today. That made him somewhat apprehensive when it came to choosing his major (like many others were and would be). Nevertheless, Terry knew that he was (and still is) talented in mathematics and physics, so studying a science-related subject was an obvious choice. He also took career prospects into consideration, and sought advice from his seniors. Finally, he opted for the Civil Engineering program at HKUST as his first choice.

Without breaking much of a sweat Terry got into HKUST's Civil Engineering program, but as he would admit, he knew barely anything about the profession. "I was — at least I thought I was — only interested in the math and physics parts, and, in general, the problem-solving process of engineering." Eventually, as he progressed through his undergraduate studies and delved deeper into the subject, that initial indifference gave way to enthusiasm, and he was able to more clearly and vividly picture himself working as an engineer.

Then, one day in 2004, close to the end of his three-year undergraduate program, Terry received a call from his sister, which — he sensed immediately — could only bear bad news: his father had passed away in his sleep. This came as a great shock to Terry. Till this very day, he finds it difficult to articulate how his father's departure has impacted him. The passing of his father would put his family into financial distress, and it was rather urgent that Terry find help for this unexpected predicament. Thankfully, just two days later, the Student Affairs Office (SAO) offered Terry financial aid which would allow him to continue his studies uninterrupted. This generous gesture also provided him with comfort during the time of grief, something that Terry has been and will be forever grateful for.

Upon finishing university Terry struggled to decide what his next step would be, and so he did some soul-searching: he liked to solve problems with logical thinking, but becoming a civil engineer was not a must for him. Eventually he decided to stay on at HKUST for post-graduate study. He felt fortunate to have met Prof. Moe Cheung (Head of the Department at the time) during his undergraduate years, who became Terry's MPhil supervisor. Terry completed his MPhil degree in 2006.



Outstanding Alumni Awardee Mr. Terry TSANG



But instead of going into civil engineering, Terry decided to challenge himself by joining the financial sector. However, after just one and a half years, the financial industry had already lost its appeal, and his mind turned toward entrepreneurship.

Terry has a younger brother, Terence, who graduated from HKUST with a degree in Computer Science and shared similar feelings regarding career choices and prospects, the most important of which being the desire to create something different. In 2008, the brothers joined forces and established a start-up.

"We weren't in it for the money; I had just always wanted to do something that I would enjoy and would be sustainable." Building a company from scratch was very challenging, let alone making a fortune from it. In fact, not only did Terry's company make no profit in its first 18 months of operation, it failed to break even, putting him in heavy debt. Terry remembers having to reach into his savings and to offer private tutorials just to stay afloat. At this point in the story we'd expect things to take a turn for the better, but two more months would elapse and there was still no profit, and Terry had used up every bit of money that he had borrowed. He was on the brink of giving up entrepreneurship altogether. "I almost let the company go. In moments like this we tend to give in to negative thoughts. I remember thinking to myself: Why am I putting myself through all this? I could have lived a predictable and stable life."

This was a make-or-break moment. Fortunately, as Terry says, "I don't give up easily on things I love," he didn't give up. Instead, he and his brother decided to try a different approach: they would each think up a new idea every day and execute it right away. It turned out that most of those ideas were not particularly good, but — either by a stroke of luck or a stroke of genius — the company developed and launched a Facebook app called "香港投票站" (now defunct), which attracted considerable traffic and earned them their first pot of gold. To the brothers, this was enough of a sign — that their company was, indeed, viable — and gave them new-found confidence. The company would go on to live through lots of ups and downs, eventually turning toward developing mobile phone games. Before long, they launched Tower of Saviors (神魔之塔), which is how most of us have come to know Terry.

At HKUST and the Department's 25th anniversary, Terry received the "Outstanding Alumni" award. Because of that, flattering labels and praises now follow him wherever he goes. To Terry, however, even though accolades are nice to have, they don't define him; he stays true to himself, and his grassroots family and upbringing. He once posed a simple question to a group of freshmen in a sharing session at HKUST — whether they had ever flown in an airplane — and they all replied "yes." In contrast, Terry's own first experience on a plane did not come until he was a freshman (during a study tour in Shanghai). "Having humble beginnings makes you appreciate all the little things a lot more, and those are what most people take for granted." For Terry and his family, a deep sense of gratitude is one of their core values. He is content with leading a 'normal' life. He never dreams about striking it rich. He never wants to pose as an archetypically 'outstanding' person. "It suffices as long as my company stays operational and viable."



Terry tells us that he has recently gotten into the habit of recording videos of himself for himself and his family on special occasions. He would record his thoughts out loud, talk about his values, things that he cares about, impetuses and goals... just snippets of himself at different moments. They will serve in the future as a reminder of who he used to be and what he used to think earlier in life. He imagines re-visiting them many years from now and being surprised by his younger self. Terry believes that memories fade and become less accurate over time. "If we ever embark upon long-term goals and projects, little records and reminders are helpful for us to stay on track, to calibrate and recalibrate our course of action, to reflect on successes and failures, and to monitor our own progress."

Terry had another lifelong dream — to one day go on exchange. This dream prompted him to enroll in MBA at HKUST. "During the admission interview, I actually told them that one of my reasons for applying to the MBA program was because I wanted to go on exchange." Terry was admitted to the MBA program in 2011, just before Tower of Saviors was released (2012). After the first year of studies, he was too busy with Madhead due to the unexpected popularity of the game, and decided to defer his studies to 2015.

Just as he was about to resume studies, however, his mother was diagnosed with cancer, and he was forced to ask for further deferment. Under normal circumstances, he would only be granted one more year of extension, and because that wasn't enough time, Terry was preparing to withdraw from the program altogether. Fortunately, the program was sympathetic to his predicament, and made an exception to extend his allowable study period by two years. The program's administration also helped him plan out the rest of his studies, so that he could continue and complete all of the program's requirements. In the 2017 Fall term, Terry was offered an opportunity to go on exchange in Spain, but his mother's health deteriorated just as he was about to leave Hong Kong. Once again, the MBA program was kind enough to help him defer the exchange to 2018, so Terry was able to finally make his dream come true. As icing on the cake, he made some lifelong friends in Spain. In 2018, Terry completed his MBA and was voted valedictorian of his class.



Some Word of Wisdom from Terry

“Good language and communication skills are as important as technical and mathematical skills — don't underestimate them. Back when we took public exams like HKALE, we only had to 'pass' English, and we often tended to focus on getting good grades in technical subjects like mathematics and physics. But when you enter and work in the real world, you'd find that languages are more important than people tend to give them credit for. For example, we often have to produce something (e.g., an email, an update, a report) in writing within a short period of time, or have to give speeches or do public speaking, and frequently it needs to be done in English. Having better language skills means that you can communicate your ideas and thoughts that much more effectively and easily, as communication facilitates logical thinking. It's always a good idea to learn and improve and pick up new languages as early as possible.”

“It's important to stay on track, but never pursue your goals through evil means,” Terry adds. “Be it in the workplace or just generally in one's life, situations would present themselves where you could get ahead or come out on top if you put personal gains and profits ahead of integrity. These situations would come by even more often when you climb up the workplace or social ladder.” Terry has come across many such temptations and understands how the immediate 'reward' might be especially hard to resist. “Yet, it is also during such times that we learn to uphold our principles, do right by everyone around us, and say no to evil.”

When asked if his persistence could also be seen as stubbornness, Terry explains how the two are different: “Stubbornness can put you in harm's way; persistence is crucial for accomplishing personal and business goals.” He gives an anecdote: once, on a trip to Bali, he was held up at immigration/customs — he was asked to pay an unreasonable tariff for his personal belongings; he was also told that he could slip a hundred-dollar bill to the officer and be released right away. He knew that it simply was not the right thing to do, even though it was an easy “resolution” to the issue, so he insisted on not paying up. “That's what persistence is — to know when to be flexible and when to be rigid.” When it comes to upholding the right values, Terry says that he is quite inflexible, unapologetic, and persistent. Persistence is more akin to perseverance than stubbornness, and perseverance is a virtue. A lot of good things in life — exercising, maintaining good health, developing good skills, starting up a business, pursuing one's dream, etc. — require perseverance on our part.

A Few Final Notes of Gratitude

“I wish to extend my sincere thanks to my previous supervisors, Prof. Christopher Leung, Prof. Ben Young and Prof. Moe Cheung. They all took good care of me during my studies and hard times. It has been a blessing to be your student.”

“I'd like to once again thank Prof. Jack Cheng, who was my classmate during our undergraduate years, and who encouraged me to apply for the Outstanding Alumni Award even though my journey hadn't been directly related to civil engineering. I'd also like to thank the Department of Civil and Environmental Engineering for the recognition. Despite the Award, I don't see myself that different from others. 'Success' is relative and debatable, but perseverance and gratitude are something I believe in. I truly hope that my few bits of advice may be useful to people.”

“To the professors, faculty members and cohort classmates of the Department who gave me unwavering support during my studies, not only have you made the Department a warm family, but you have also shaped my most formative years, from which I draw very fond memories and inspirations till this day.”

HKUST CIVL 30th Anniversary Commemorative Booklet — Connections

2021 marks the Pearl (30th) Anniversary of the Department of Civil and Environmental Engineering (CIVL) at HKUST. As the old Chinese saying goes, “三十而立” (be steadfast at thirty), being thirty years old means that all our endeavors through the years have, indeed, come to fruition, and this commemorative booklet is a celebration of such a milestone occasion.

The publication brings us — staff, alumni, students and friends — together on a journey traversing the past, present and future, reliving our many accomplishments since 1991, reaffirming our visions and commitments old and new, at the same time exploring the countless exciting possibilities ahead. We hope you have enjoyed the journey.

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Contribution

Special thanks to staff, alumni and students who have kindly contributed their time and/or photos to this commemorative booklet.

Care for the Environment

While this publication is printed on environmentally-friendly paper, we do ask that you share your copy with friends and colleagues to help reduce our carbon footprint. Alternatively, you may read the booklet online at **ce.ust.hk**.

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