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OUR DIGITAL SELVES

How lines are blurring between humans and technology

INSPIRATION FROM NATURE

A new microfluidic device that mimics the responses of clover

ASSESSING HONG KONG'S LONGEVITY

Why our population has the world's longest life expectancy



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OUR DIGITAL SELVES

Artificial intelligence (AI) is becoming deeply embedded into the functioning of our daily lives, often for the better but also with unknown consequences. HKU scholars have been looking at these issues from multiple perspectives, as shown in the examples on these pages – revealing why it is urgently important to improve our ability to communicate with AI; the potential impact on concepts of the self from digitisation; the positive impact on health from AI; how our physical interaction with technology influences our behaviour; and how the art world is producing accessible works that expose and poke fun at the digitisation of our lives.















OUR DIGITAL SELVES

Artificial intelligence (AI) is becoming deeply embedded into the functioning of our daily lives, often for the better but also with unknown consequences. HKU scholars have been looking at these issues from multiple perspectives, as shown in the examples on these pages – revealing why it is urgently important to improve our ability to communicate with AI; the potential impact on concepts of the self from digitisation; the positive impact on health from AI; how our physical interaction with technology influences our behaviour; and how the art world is producing accessible works that expose and poke fun at the digitisation of our lives.



AL AND THE LANGUAGE BARRIER



Artificial intelligence (AI) is increasingly making important decisions about our lives. But does AI understand terms like 'creditworthiness' and 'terrorist threat' the same way humans do? Chair Professor of Philosophy Herman Cappelen argues it is time for more dialogue and effort across disciplines to address this important issue.

I has become an embedded backdrop to our daily lives. When you go to the bank seeking a loan, the decision will almost inevitably be made by Al. If you have a malignant tumour, your treatment will be informed by Al. Some court decisions in places like China and the US are decided by AI. Whether someone should be flagged as a terrorist – and whether a bomb should be dropped on a specific site – is also a decision driven by Al.

"Artificial intelligence is everywhere now. But how can we be sure that it uses the same meaning we do when we say 'medical treatment' or 'loan' or 'bomb'? How can we get AI that shares our language, that we can understand and that can understand us?" said Chair Professor of Philosophy Herman Cappelen.

Professor Cappelen has pioneered the use of philosophies of language to consider human interactions with Al. His aim is to understand which questions need to be addressed to make AI more interpretable to humans and ensure they are not a threat to humans - a very real concern in some circles, particularly as Als become more powerful. He co-authored a book last year, Making Al Intelligible: Philosophical Foundations, that explores these issues.

"To protect against that threat, some people have introduced the idea of aligning the values of AI with human values. But in order to do that, the moral language that we speak needs to somehow or other be incorporated into Al," he said.

Language is also a factor in ensuring humans understand why Als make decisions. The European Union has a law requiring explanations, but the technology still lacks sophistication.

Morality, norms and algorithms

Professor Cappelen argues Als need to be able to explain themselves using human language and values and that this cannot simply be achieved by tweaking algorithms and mathematical formulas because human language and meaning are sociological phenomena that develop through interaction with others. "It's as if you just studied the brain to understand language. It is not only the brain that determines whether you understand language, but also your interactions with the larger community," he said.

This means experts from the humanities and social sciences need to also be involved in developing AI that is interpretable and can offer explanations, not just computer scientists and engineers. "In order to think that the AI has norms or a morality or an ethics, you need to know what it is for a program to have a norm in it. And that requires understanding of the role of moral language, the nature of moral principles, the



studying these questions. "Right now, the people dominating the

might think is a bit worrying," he said.

He is trying to foster interdisciplinary collaborations through the AI & Humanity Lab he has established in the Faculty of Arts, which explores how Al interacts with and transforms humanity, and his membership of the new HKU Musketeers Foundation Institute of Data Science, which is engaged in cross-faculty research on big data and Al.

Time pressures

Professor Cappelen acknowledges the task of injecting human values into Al is not an easy one, and it becomes even harder when cultural considerations need to be accounted for.

"I think it is the biggest challenge AI faces right now," he said. "But the solution can't be to say that AI is not going to have any morals at all. If you're worried about existential threats as Als get smarter, then the solution could be that we don't need to pick a very particular morality, we just need to make sure that the Als like humans, that they want to support our welfare and that they're not going to kill us.



There is an argument that what happens with this technology over the next 20 to 25 years and what we do with it will be the most important decision in human history, because it will shape everything that comes after it.

nature of morality and so on. Philosophers and social scientists have spent years

discussion on the direction and proper use and social implementation of this technology are those who make the technology – which you

"There is an argument that what happens with this technology over the next 20 to 25 years and what we do with it will be the most important decision in human history, because it will shape everything that comes after it. I don't know if that's true, but it is certainly not impossible. The technology develops so fast and the consequences are almost impossible for us to understand. If we don't get some control over it right now, we might just lose the chance to have control."



Making Al Intelligible: Philosophical Foundations by Herman Cappelen and Josh Dever was published in 2021 by Oxford University Press.

THE 'DIGITALISED SELF'

The effects of digitalisation on the human mind and sense of self are only starting to be explored. Dr Chan Kai-tai is among those pondering the potential impact.

n 2016, Clinical Associate Professor of the Department of Psychiatry, Dr Chan Kai-tai, took a short break from his previous work as a psychiatrist at Castle Peak Hospital to study history and culture as an Academic Visitor at the University of Cambridge. He was used to switching gears – he is also a professional songwriter – but this time he was motivated by an important professional purpose: he wanted to deepen his understanding of the impact of technology on the human mind and human culture.

"Digitalisation is a two-edged blade. Of course, it can improve our lives - we are now omnipotent with a smartphone compared to 30 years ago. But on the other hand, humans have not tended to have much foresight about the potential long-term adverse effects of technology," he said.

The Industrial Revolution and urbanisation, for instance, gave rise to many conveniences and reduced the uncertainty caused when survival depended on farming. But at the same time, a sense of alienation emerged alongside a weakening affiliation to institutions such as the church and monarchy. Atomised ideas about the 'self' started to develop, most famously in Freud's 'ego', 'id' and 'superego' constructions.

Dr Chan is concerned that digitalisation may also have as-yet-unknown impact on the human mind and self because of the blurring boundary between the physical and virtual worlds. People are developing different online identities and there are potential changes in our fundamental experiences. He recently published an academic paper proposing the idea of a 'digitalised self' to describe these developments.

Evidence of influence

"I'm not saying there must be a digitalised self, but the evidence is pointing towards the idea that there is some unique and profound influence of digitalisation on our mind and society, which might have further impact, including on mental health. This still needs more discussion and research and my purpose as an academic and a clinician is just to ask this question," he said.

The evidence he refers to includes research by others showing, among other things, that there are differences in the brain areas responsible for language among pre-schoolers exposed to different digital media use and brain changes in adolescents who engage in more social media use. The potential implications need further exploration. "The timeframe is still very short because digitalisation has become prominent only very recently," he said.

The important issue is that if something potentially fundamental to humankind may be changing, we should pay attention before it is too late. Because we cannot undo it at the press of a button.

Other scholars have also observed emotional impact from digitalisation, such as moral outrage in the digital space; behavioural changes such as internet addiction; cognitive challenges in the human brain since it is not wired for multi-tasking; manipulation of the ways people communicate and socialise online; and the use of different identities online which raises guestions about potential identity confusion and disconnection with the physical world.

Dr Chan himself is studying the impact of digitalisation and smartphone addiction on the human mind, including self-concepts. He is also curious about the different impact digitalisation may have across generations. "Those of us who have not grown up in the digital world are digital immigrants - our first experience of digitalisation has involved migrating some part of our original selves in the physical world, such as our original identity, to the virtual world.

Dr Chan also works on the development of youth mental health and he advises people to set boundaries and practise healthy use of digital devices, especially smartphones. But his team also makes use of the advantages of digitalisation to access youth.

An innovative online mental health advisory service, called 'headwind', established under the leadership of the Chair Professor in Psychiatry, Professor Eric Chen Yu-hai, invites young people in need to seek advice from a psychiatrist on the platform and promises a high degree of privacy, so they can be motivated to seek help. The service has attracted more than 2,000 users since its launch in late 2020.

"Mentally distressed young people might tend to seek help through digital platforms, where we can engage them and further help in both physical and online settings," Dr Chan said.

Still, he advocates continued investigation of this new idea of a digitalised self. "I'm not sure whether the possible changes arising from digitalisation on the human mind and self will be eventually rejected or not. The important issue is that if something potentially fundamental to humankind may be changing, we should pay attention before it is too late. Because we cannot undo it at the press of a button," he said.



DR CHAN KAI-TAI

"Younger generations born in a highly digitalised world are digital natives and might have additional formation of the self in the virtual world. But what happens when they go back into the physical world, and which self would they prefer?" he said.

Setting boundaries

COVER STORY

any of us have good intentions when it comes to staying healthy, but often we get sidetracked by the easy way out – for instance, ordering French fries rather than salad at a restaurant or online, or spending most of our time at the gym scrolling through our phones rather than lifting weights. In psychological terms, these are problems of self-regulation. But a study led by Professor Jack Jiang, Padma and Hari Harilela Professor in Strategic Information Management, of the HKU Business School shows that technology can induce us to make better choices just by making small changes to the way we interact with it.

Focussing on smartphones, the study asked people to choose from a list of options on a phone provided to them that had been modified to require users to either tap lightly using gentle exertion, or press hard, which requires extra force. Pressing was expected to enhance self-regulation and the study bore this out: people who pressed hard not only ended up making healthier choices, but subsequently exhibited healthier behaviour.

"We're trying to understand how a 'digital nudge' can fundamentally influence people's behaviour," Dr Jiang said. "Other researchers have commonly observed that people's beliefs drive their behaviour, but we find something opposite. We change behaviour first and it influences beliefs." A digital nudge happens when people are not deliberating on their actions but performing them almost automatically, opening a window for influencing behaviour. Earlier research showed that when people have to exert more muscular strength in a task, they feel more determined to act in other ways. Taking up that idea, Dr Jiang devised three experiments that used pressing or tapping on phones to test the digital nudge effect.

Tapping out

The first experiment took place in a university canteen where students were invited to a table and invited to select a beverage for free on a smartphone. There were four beverages, two healthy but not tasty (such as a vegetable drink) and two tasty but not healthy (such as a soft drink). Unknown to the students, participants were divided into two groups, with one group having to press hard on the screen to answer the questions and the other group simply tapping the screen. The result was that those who pressed hard were more likely to choose the healthy drink. The effect was strongest among students who had shown a higher level of health knowledge.

The second experiment took place outside a gym of a community centre where participants were first asked to indicate how much exercise they intended to do on a smartphone; they then reported back after exercising to receive a small cash award. Those who had to press hard set more challenging exercise goals and actually reported doing more exercise. This was especially the case for participants who indicated that they exercise to improve their fitness rather than simply prevent physical deterioration.



PROFESSOR JACK JIANG

The digital nudging effect is significant. In situations where you want people to be more careful with their behaviour, you probably should consider using force-based touch.

The third experiment was particularly relevant to the context of the COVID-19 pandemic: it set out to see if pressing or tapping would influence people's hygiene practices. Participants were asked to read educational materials about hygiene through a mobile device, then observed as they moved to a separate room and were asked to recommend personal hygiene products, such as masks and disinfectants, for university purchase. The aim was to see if pressing was more likely to induce them to follow the advice contained in the educational materials.

Failing the test

They were greeted at the door with an offer of a handshake (this is not advised for infection control), asked to use another smartphone that looked dirty (disinfectant wipes were placed on a table that they could access if they wished), and observed to see whether and how often they touched the outer surface of their mask and kept at least one metre distance from each other. Those who failed the test shook hands, did not clean the phone, touched their mask and stood too close to others.

In all cases, people who had tapped rather than pressed at the start, when reading about hygiene, were more likely to 'fail' and adopt unhygienic practices. Those with higher health knowledge showed an even stronger positive effect from pressing versus tapping.

"The digital nudging effect is significant. In situations where you want people to be more careful with their behaviour, you probably

PRESS FOR SUCCESS

The way we physically interact with technology can influence our choices and even our behaviour.

should consider using force-based touch," Dr Jiang said, who pointed out that a number of devices are designed around touch, such as Tesla's new steering wheel and Apple's force touch trackpad.

"At the same time, we do not want to overgeneralise the findings. These results happened when people were not deliberating over their decisions, which is often the case when people use their smartphones. But if they have to think carefully before a decision, then this effect is gone," he said.

Dr Jiang and his colleagues are now looking at how to apply the findings in a fintech context.

READING OUR BODIES

Researchers are not far from the day when they can produce a small desktop device that can read our biochemical signals and tell us the state of our physical and even mental health within minutes. Dr Lin Haisong is among those making advances in the field.

earable devices like the Apple Watch can track your blood rate and blood oxygen levels and detect whether you fall. But to researchers of wearable devices, this is old hat.

"Those kinds of devices were developed more than 10 years ago. Some researchers are still working on improving sensors for physical signals but the field that is very hot right now is detecting biochemical signals within our body. Imagine using your smartwatch to sense your glucose level, that would be very useful for diabetic people," said Dr Lin Haisong, Research Assistant Professor in the Department of Mechanical Engineering.

Dr Lin is in the thick of these advances, having recently developed what he calls a ferrobotic digital microfluidic platform, that can read and detect various kinds of biochemical signals, such as glucose, viruses, immunological health markers, nutrient levels and stress hormones, from our saliva, sweat, urine or blood. And it does not have to be worn – people could simply press their finger on it.

The platform takes droplets of bodily fluids and divides them into tiny volumes so they can be tested by a variety of biological assays. The latter are add-ons to the platform that can be developed by other specialists, similar to software for a computer, to help create a tool for highly personalised medicine.



DR LIN HAISONG

I feel this field of biosensing and microfluidics and bioelectronics is going to play a huge role in the future and benefit not only humans, but also some animals.

Thermometer for everything

"When we talk about the human-machine interface in the field of biosensing, sensing biochemicals within our body is not limited to wearable devices. In fact, we already do things like rapid antigen tests that are an example of biosensing.

"We are using microfluidic technology to try to create small devices that hopefully could be deployed for various purposes. For instance, a doctor or researcher would just have to put the sample into our platform and the answer would come out. Currently, laboratories have to spend time pipetting and processing samples under the microscope and centrifuge and it can take several hours," he said.

Dr Lin envisions that the platform could even sit alongside personal computers and people could purchase applications that produce readings of parameters that are important to them. They could check whether their stress hormones are high indicating they should rest, take their temperature, or do HIV or pregnancy tests and the like, all on this one device. It would be like having a thermometer for everything.

The first findings on this platform have already been published and work is underway on the next generation. The potential for detecting viruses, such as COVID-19, is obviously attracting a lot of attention. "Our platform can sense COVID-19 very efficiently, I'd say at least 10 times more efficiently than current technological agents," he said.

A question of when, not if

Although there are still some challenges, such as sorting out materials compatibility, Dr Lin believes the endgame is in sight for making devices like his platform widely available.

"I'm very confident they will be in use within 10 years or less. It's just a question of whether I will be the person who makes it happen. A lot of people are working on this," he said. "After COVID-19, we all know how important this data and monitoring technology are."



A ferrobotic microfluidic chip for automated biochemical sample processing and biomarkers detection.

Dr Lin has one advantage in the race to develop his platform in that he is motivated not only by science but by a desire to help other beings, be they human or animal. He was first inspired to work on sensing technology when he was working at the University of California, Los Angeles. His laboratory was close to the university hospital, and he noticed cerebral palsy patients who were unable to talk. "I wanted to find a way to help them communicate their pain and discomfort," he said.

Later, he realised sensing technology could also help animals after a friend's dog died of cancer within a week of diagnosis; the friend was upset as they were aware the pet had been in pain. "I feel this field of biosensing and microfluidics and bioelectronics is going to play a huge role in the future and benefit not only humans, but also some animals," he added.



The application of wearable microfluidic system for glucose and lactate monitoring in sweat.



FOR OUR SAKE

Artists are playing with new technologies to reveal their darker uses in surveillance, identity and the monetisation of art, and also having a little fun with them. Dr Monica Lee Steinberg explains.

Italian artist Paolo Cirio's Street Ghosts at the Microwave International New Media Arts Festival 2016 held in the Hong Kong City Hall. (Courtesy of Paolo Cirio)

In 2012, American artist Heather Dewey-Hagborg unveiled a new project, *Stranger Visions*, consisting of portraits derived from people's DNA that she had extracted from detritus collected from the street – cigarette butts, lollipop sticks, strands of hair and the like. She had learned to process the DNA herself through an extension class at a community laboratory; she fed the results into a program that matched genetic code with observable traits, ultimately realising 3D printed portraits of strangers derived from their genetic footprint.

That same year, New York-based Italian artist Paolo Cirio initiated *Street Ghosts*, a project which involved gluing printouts of people from Google Street View onto sidewalks and buildings around the world. Later, he created *Obscurity*, comprising clones of for-profit mugshot websites which collect publicly available arrest photos and records and charge for both access to and removal of the information. He also released *Capture* in 2020, a database and public exhibition of the faces of 4,000 French police officers whose images were taken from publicly sourced photos.

What these works have in common is their attempt to wrestle with the disruptions created by new technologies. Dr Monica Lee Steinberg, Assistant Professor in American Studies, has been studying the phenomenon.

"These artists are activating existing technologies and legal loopholes to expose how they work," she said. "The artworks demonstrate how personal information is neither private nor protected. They demonstrate facets of surveillance capitalism and how our personal information is being brokered with almost no regulation."

A condition of convenience

The works also draw unsettling attention to an area that they do not transgress, at least

in the United States and France where they have been shown, which is privacy law. Dr Steinberg uses the term "extralegal portraiture" to describe them.



In the Street Ghosts project initiated by Italian artist Paolo Cirio, photos of people found on Google Street View are printed and posted at the same physical locations where the photos were taken. (Courtesy of Paolo Cirio)

"Extralegal portraiture demonstrates the more insidious potential of emerging technologies. It leaves viewers both curious and suspicious and it changes our interaction with society more broadly," she said.

Capture, for instance, turns our usual idea of surveillance on its head – pointing the camera at the police and spotlighting the power dynamics between law enforcement and citizenry. *Obscurity* shines a light on those who extract personal data for exploitative purposes. *Stranger Visions* reveals how disturbingly easy it is to conduct bio-surveillance. Along the way, the artists made special efforts to generate news coverage, thus encouraging public awareness and caution.

"If an artist who took an extension class at a community laboratory is able to test the DNA of strangers, what might someone else – perhaps someone less bound by ethical concerns – realise in the coming decades and



alongside rapidly advancing forensic and facial recognition technologies?" Dr Steinberg asked.

"The problems highlighted by extralegal portraiture are exclusive neither to surveillance nor art – they are the very condition of existing within the world of convenience."

Imagining value into existence

The art world's embrace of another technology, non-fungible tokens (NFTs), has also been a disruptive force, sometimes for the better because it enables artists to earn future royalties from their works, but also in a more uncomfortable way because it exposes how we attach value to objects.

NFTs are smart contracts which can help establish provenance and verify authenticity. Since property ownership is generally asserted through the right of exclusion, what does it mean to own an NFT if the associated artwork is already online, and anyone can view it? Artist Damien Hirst poked fun at this concept recently with his 2021 work. The Currency. for which he created tokens associated with 10,000 dot paintings and sold each NFT for US\$2,000. He gave buyers two options: after one year, they could either keep the physical manifestation of the artwork or the token, but they could not keep both. About half of buyers opted for the NFTs and this fall he intends to burn the real paintings. Those who opted for the tangible paintings had their NFTs deleted.

"Without the NFT, it is difficult to confirm whether the physical manifestation of the artwork is authentic. But if the physical

DR MONICA LEE STEINBERG

If an artist who took an extension class at a community laboratory is able to test the DNA of strangers, what might someone else – perhaps someone less bound by ethical concerns – realise in the coming decades?

manifestation of the artwork is destroyed, there is only proof of ownership," Dr Steinberg said.

"Value is about trust, but what happens when people realise that anyone can imagine value into existence? Hirst is activating mechanisms that already exist to expose how they work and how art in the 21st century is being financialised."

The thread uniting these works is the pervasiveness of digital technology in our lives. "All of these artists are creating a user-friendly means of demonstrating the problematic issues behind these technologies. At the same time, they are pulling pranks and making fun of the art world in creative and unexpected ways," she said.



Paolo Cirio initiated the Obscurity project and cloned major mugshot websites and scrambled their data to obfuscate the arrestees' records. (Courtesy of Paolo Cirio)

LIVING LONG, **DESPITE THE ODDS**

HKU researchers have revealed why Hong Kong has the longest life expectancy in the world: unlike most other places, it has attained a unique combination of economic development and successful tobacco control. Making the most of those extra years is another matter.

ince 2013, life expectancy at birth in Hong Kong has been the highest in the world – 88.1 years for women and 82.7 years for men (as of 2020). And this has posed a conundrum for public health scientists and practitioners. Hong Kong has one of the highest income inequalities in the developed world, one of the highest population densities and its people work some of the longest hours. Hong Kong people also come 81st in the world when ranking their quality of life, according to a 2022 Gallup report. Plus, Hong Kong has kept its health expenditure as a fraction of gross domestic product at 5.9 per cent (lower than other high-income regions); its air quality is also not stellar. So why are people living so long?

It's a question of interest not only locally but internationally, as a commentary in the US National Academy of Medicine in 2020 put it: "there could not be a more important puzzle to solve for the rest of the world."

Now, a solution has been found through the work of Dr Michael Ni Yuxuan, Clinical Associate Professor in the School of Public Health and colleagues. Dr Ni conducted the largest and most comprehensive assessment of Hong Kong's longevity to date, which has been published in The Lancet Public Health.

"Explanations for longevity in Hong Kong have included economic prosperity, our universal health coverage, and our very low maternal and infant mortality. But these things are true for many high-income regions, including in Asia. What really distinguishes us is that we have attained a low smoking prevalence for both men and women," he said.

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"For the first time, we showed that successful tobacco control was the reason why Hong Kong's life expectancy has surpassed all other populations."

Vigilance still needed

Using life expectancy data from 18 highincome countries from 1960 to 2020 and mortality data for 263 million deaths, they demonstrated that Hong Kong had the lowest mortality for cardiovascular diseases among high-income regions and one of the lowest mortalities for cancer in women – both of which are linked to smoking.

Only about 10 per cent of Hong Kong people smoke, versus 28 per cent in France, 20 per cent in South Korea and 16 per cent each in the UK and US. In China 42 per cent of men smoke. On average, smokers die 10 years younger than non-smokers.

For Dr Ni, the results show that there is a continued need for vigilance against tobacco around the world (see also page 38).

But he cautioned Hongkongers against being too celebratory about the achievement just yet. "A caveat to this whole story is that although we have ranked first in the world in longevity for the past eight years, a global survey has shown that mental well-being in Hong Kong was among the worst. We have a very long life expectancy, but on average it may not be a very prosperous, fulfilling and happy life," he said.

Mental health remains a concern

Dr Ni's team has been studying this aspect of health, too. Using the FAMILY Cohort of 46,000 participants, they have conducted multiple surveys on physical, mental and social



Dr Ni (right) organised the 7th Public Health Forum at the School of Public Health on the Major Health Challenges of the 21st Century, where he also presented findings on the evolution of population mental health in Hong Kong over the past decade.



DR MICHAEL NI YUXUAN

We have a very long life expectancy, but on average it may not be a very prosperous, fulfilling and happy life.

well-being in Hong Kong - the key domains of health as defined by the World Health Organization (life expectancy being only one measure of health). The FAMILY Cohort serves as a health and well-being barometer for Hong Kong, having tracked the evolution of physical, mental, and social well-being with more than 20 longitudinal follow-ups since 2008.

Notably, the FAMILY Cohort has shown that while Hong Kong had the lowest levels of depression in 2011-2014, these have

risen significantly since and have not dropped back to the baseline. High levels of depression and anxiety were recorded during the fifth pandemic wave this spring, when Hong Kong had the highest daily COVID-19 mortality rate in the world.

Dr Ni believes mental well-being should be a factor guiding health policies during and after COVID-19 since mental health disorders are the leading cause of disability in the world and affect one in four people.



Number of smoking-attributable deaths (per 100,000 population per year) by sex from 1979 to 2016

"There is evidence that actions to address inequalities, poverty, and urban systems, and taking a lifelong course approach to mental health from birth are important. We've found that among all the determinants of mental health, some of the most important are the social determinants," he said.

"The next phase is to look at how we can prevent the onset of mental health disorders because they are so chronic and disabling, and how to improve the mental health of populations."





At the start of the COVID-19 pandemic, deposits into US banks increased from US\$13 trillion in January 2020 to US\$16 trillion by the end of the year, prompting business researchers to investigate how depositors were responding to the crisis and why. r Mingzhu Tai and Professor Chen Lin, Stelux Professor in Finance, from the HKU Business School, were particularly interested in the mechanisms that were driving the increase in deposits during the pandemic and, for their study entitled 'How Did Depositors Respond to COVID-19?", analysed vast resources of data to find out what the thinking was behind people's actions.

"In the spring of 2020 when COVID-19 broke out globally, we were keeping close track on how the pandemic was impacting our economy and how policymakers in each country responded to it," said Dr Tai. "In particular, we noticed that deposits and household savings increased dramatically starting from March and April of that year. Since deposits and household savings play a crucial role in our macroeconomy and financial system, especially during economic hardship, we decided that we should investigate what drove this surge in deposits and try to understand what we could learn from it regarding its economic and policy implications."

Dr Tai and Professor Lin, working in collaboration with the University of California, Berkeley and the Chinese University of Hong Kong, examined five potential drivers in their research. The first was the 'precautionary savings' view – also known as Aesop's credo, after the Greek fable writer's philosophy "it is thrifty to prepare today for the wants of tomorrow" – whereby households saved more due to concerns about employment and income security triggered by the pandemic.

Professor Lin said: "The testable predictions associated with this view propose that local COVID-19 infection rates had a positive relationship with local concerns about future job losses and income, a positive association with increases in local bank deposits, and a negative relationship with the local deposit interest rates."

The second possible driver was the 'flight-to-safety' theory which stresses that individuals reallocated part of their savings into bank deposits and other safer investments to avoid the financial disruptions triggered by the pandemic. "It predicts that infection rates would have had a stronger negative effect on local deposit interest rates among safer banks and a positive impact on insured deposits," said Dr Tai.

Third, the 'drawdown-and-deposit' view starts by noting that firms, having made large withdrawals from their lines of credit, would have then deposited this money into banks. "This view proposes a positive relationship between county-level infection rates and local bank deposits by firms; a negative relationship between infection rates and deposit rates; and no connection between infection rates and deposit rates when firms did not draw down their credit lines," said Professor Lin.

Fourth, the 'demand-for-deposits' view, proposes that the banks themselves may have attracted funds by raising deposit rates and cutting new lending – a notion which implies that local infection rates will be positively related to local deposit rates.

Finally, fifth was the 'policy response to the pandemic' view. "This view suggests that the US government's economic policies enacted in



DR MINGZHU TAI

Our analysis found that local COVID-19 infection rates were positively associated with intensified anxieties about future job losses, increased expectations of future income losses and a concurrent reduction in spending due to these expectations.

response to the pandemic – the Coronavirus Aid, Relief, and Economic Security Act and the Paycheck Protection Program – were responsible for the increased deposits, since more federal funding was given to counties with higher COVID-19 infection rates," said Professor Lin. "Thus, the view goes, the more local infections, the higher the local deposits."

Precautionary savings mechanism

"Our empirical findings support in particular the precautionary savings mechanism," said Dr Tai. "Our analysis found that local COVID-19 infection rates were positively associated with intensified anxieties about future job losses, increased expectations of future income losses and a concurrent reduction in spending due to these expectations. Infection rates were also positively associated with a boom in local bank deposits, especially retail deposits, and declines in the interest rates offered on local deposits – each of the testable questions received a solid 'yes."

"Human factors turned out to be the key to answering the question," said Professor Lin. "Anxiety really does galvanise people into action."

Regarding the other four potential drivers under consideration, none of them were supported or confirmed.

"The 'flight-to-safety' view was not supported because the study did not find that local infection rates were associated with a larger reduction in local deposit interest rates or a larger increase in insured deposits," said Professor Lin. "Nor was the 'drawdown-and-deposit' view confirmed because no weaker connections between county-level exposure to COVID-19 and deposit rates were found, nor were there any larger increases in wholesale business deposits relative to retail banking deposits."

"Findings on the 'demand-for-deposits' view were inconsistent, as COVID-19 infection rates were associated with material declines in deposit rates, rather than increases," said Dr Tai. "This negative relationship between deposit interest rates and infection rates also indicated that neither national- nor state-level macroeconomic policy had any causative effect, which meant the policy response perspective was also unsupported."

OUT OF THE BLUE

Marine ecosystems serve the critical environmental function of sequestering and storing blue carbon from the oceans and atmosphere, an essential tool in the fight against climate change. A multidisciplinary project is developing new ways to protect Hong Kong's precious marine environment using 3D printing. irst coined more than a decade ago, the term Blue Carbon (BC) describes the disproportionately large stores of carbon in coastal vegetated ecosystems. In the years since, the role of BC in environmental enhancement has reached international prominence, and Hong Kong's mangrove swamps and seagrass beds are rich stores of it.

However, both of these ecosystems have suffered damage and even destruction over the years, and Dr David M Baker, Associate Professor in the School of Biological Sciences, and his team are working to find ways to protect, repair and nurture the habitats and ensure Hong Kong's blue carbon stores are preserved.

'We've lost so many," he said. "But if we can restore them we have the potential to mitigate climate change. Coral restoration has biqued interest in the private sector, and even though such 'animal reefs' respire just like us, and therefore are a source of carbon dioxide, the tremendous amount of life they support can function to enhance decarbonisation."

One of the solutions utilises 3D printed structures. "3D printing fascinates me – some are calling it the next Industrial Revolution," said Dr Baker. "I had never used it before but HKU is a powerhouse for 3D printing in a variety of materials and across a variety of Faculties, including Architecture, Engineering and HKUMed.





DR DAVID M BAKER

Those tiles are doing beyond well! As an active management tool to aid coral restoration they're really effective. Two years on, the corals are growing so well that the tile is no longer the star of the show – that role goes to the marine life that is covering it. We get mussels, lobsters, female cuttlefish lay eggs in the tiles as they offer great protection.

"We won a government contract from the Agriculture, Fisheries and Conservation Department to help restore lost coral reefs in Hoi Ha Wan Marine Park, north of Sai Kung Country Park, which is home to more than 60 types of coral and 120 species of fish."

Mass mortality

In 2015, an algal bloom of the dinoflagellate Noctiluca scintillans is believed to have caused what Dr Baker terms a mass mortality in the park. "The problem with these algal blooms is that people love them – it's often called 'sea sparkle' because it looks cool – but it is not a good sign for marine life. The reason the cells float is because each one has liquid ammonia in it."

It was the first time the government had contracted out such a task but, by the time the team was set to start, the site in question had changed dramatically and the reef had eroded away completely, leaving only sand. "Coral won't grow on sand alone," said Dr Baker. "We had to come up with a solution, and we decided to tile the seafloor – like you'd tile your bathroom or kitchen. The tiles provided a base for the coral to cling to."

One diver, one tile

Dr Baker worked on the first design with PhD student Ms Vriko Yu and research assistant Mr Jordan Pierce. "We discussed the design and agreed it should be modular not heavy – one diver should be able to carry one tile – the shape should be hexagonal so the tiles can lock together, and they would be made from terracotta clay and raised off the sand."

Associate Professor Christian Lange, Head of the Faculty of Architecture's Robotic Fabrication Lab with Assistant Professor Lidia Ratoi, re-designed the tiles to make them 3D printable in terracotta clay. With their expertise in 3D printing, they also organised and executed the manufacturing of the tiles. In July 2020, 128 reef tiles were placed at three sites in Hoi Ha Wan Marine Park by Dr Baker and his team.

"Those tiles are doing beyond well!" said Dr Baker. "As an active management tool to



The reef tile was first adopted by the Agriculture, Fisheries and Conservation Department as an active management tool to aid coral restoration in Hoi Ha Wan Marine Park. (Courtesy of archiREEF)

aid coral restoration they're really effective. Two years on, the corals are growing so well that the tile is no longer the star of the show – that role goes to the marine life that is covering it. We get mussels, lobsters, female cuttlefish lay eggs in the tiles as they offer great protection."

The design has since been patented by HKU, and out of this has grown spin-off company archiREEF Ltd – co-founded with Ms Yu, who is also CEO of the company – which has contracts in Hong Kong and overseas, including Abu Dhabi where it has a production facility.

The website sets out the company's aims: "We offer climate solutions by restoring degraded marine ecosystems. We combine expertise in marine biology and the latest technologies in 3D printing techniques and material science to create artificial habitats that are best suited for threatened marine life."

Next, the company is working on a Sino Group-funded project in association with the Fullerton Hotel and Ocean Park to create a new reef in Deep Water Bay. "The project includes an outreach plan to invite gifted students to join restoration activities," said Dr Baker. "There will be opportunities to dive to reefs and full public participation is planned."

archiREEF is also driving a marine restoration project in Abu Dhabi. "This is a holistic undertaking," said Dr Baker. "There has been rapid urban development there, and now there is a strong desire to look at nature and how marine life can be maintained and nurtured. It's all part of the larger picture to work towards climate change resilience."



A 3D designed reef tile was printed through a robotic 3D clay printing method with generic terracotta clay and then fired at 1,125 degrees Celsius. (Courtesy of Christian Lange)

CONSUMING INTERESTS

A study reveals that digital discourse about and involving food – including mukbang (livestreamed eating) and everyday vlogging – serves as a means of realising the sociocultural values of eating together and eating well.



ukbang is a Korean word, short for *muknunbangsong*, and means roughly, 'a broadcast where people eat'. Mukbang broadcasts typically feature a solo eater who consumes a large meal consisting of several dishes and speaks through a camera while viewers watch online and type comments through real-time chat. The phenomenon has been popular in Korea since the late 2000s and has since gained popularity worldwide.

Dr Hanwool Choe, who is Assistant Professor in the School of English, began her research interest in language and food in earnest when, as a PhD student, she wrote term papers about mukbang for coursework.

"I first started watching mukbang just for fun," she said. "At that time, I was doing my graduate studies in the United States and used to watch mukbang when I was craving Korean street food. But since I'm a discourse analyst who's especially interested in analysing online communication, after a while I saw the resemblance between mukbang and the typical mealtime that we have at the physical dining table. That's how I started studying this topic.

"I am primarily interested in how mukbang contributes to creating online commensality and a virtual sense of togetherness: how people (a host and viewers) talk about food; how watching someone eating comes to the fore into interaction; and what kinds of identities are constructed and presented in mukbang interaction."

At the same time, Dr Choe has been studying another online content in relation to food and eating – everyday vlogging (video blogging) by Korean expatriates. "In everyday vlogs, vloggers share what and how they eat in their everyday lives, ranging from grocery shopping and cooking at home to dining out. Their daily eating scene seems very mundane, but shows the ways in which they get acclimatised to different cultures, traditions and language, thus accomplishing their new ordinary identities as expatriates and local selves," she said. "What's interesting is that their daily eating is evaluatively framed as 'eating well' by viewers. In the context of everyday vlogging, eating well is perceived to be more than a healthy or luxurious eating style. It rather resonates with the ordinariness of what and how to eat in our daily lives."

Through highlighting how technologies connect food and eating practice to digital discourse, she gained a better understanding of how digital communication about and involving food embodies the sociocultural values of eating together and eating well.

Vlogging itself is not new on social media, it has existed for a long time at the centre of webcam culture, and initially much of the content was made by (micro)celebrities. "In it, they show (off) what is called a day/ week in the life," said Dr Choe. "Now lay people – usually the younger generation – also make their own YouTube channel to share their daily lives. I see everyday vlogs of a variety of lay people, including professionals, housewives, and students, and everyday vlogging is, to some extent, an extended form of sharing photos and videos on social media like Instagram. I would say the popularity of everyday vlogging indicates how living ordinarily has become used as a communicative



DR HANWOOL CHOE

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resource in online environments for ordinary self-presentation as well as socialisation (with anonymous people)."

Mukbang challenges

Mukbang content varies, ranging from ASMR (Autonomous Sensory Meridian Response) to food challenges where the host eats his/ her way through vast quantities of food, often within a time limit. Dr Choe's research primarily focusses on livestreamed mukbang where a host speaks to his/her viewers, while eating, and viewers interact with the host as well as each other via a text-based live chatroom, while watching.

"Livestreamed mukbang does not include the challenge element but virtually embodies eating together that we usually have at a physical dining table, when eating with others," said Dr Choe. "People watch livestreamed mukbang for various reasons. It can serve as 'eating for another' who cannot or does not eat for their own reasons – for example, they are on a diet, have morning sickness, or can't access specific foods. In addition, people watch it so they have a virtual eating companion when they eat alone."

Mukbang also has some entertaining elements: viewers donate cyber money which can be converted into real money, so mukbang hosts endeavour to make theirs more fun. Dr Choe compares this monetisation to the gratuity that we give to street performers.

In conclusion, Dr Choe offers her observations on two simultaneous identities of mukbang hosts, constructed in livestreamed mukbang. "First, expert eaters. That is, mukbang hosts 'eat well' [note, this is different from the meaning of 'eating well' in everyday vlogs] and thus can earn money – via viewers' donations and sponsorship – through their eating. Second, mukbang hosts act as lay food reviewers: that is, they evaluate food in lay rather than expert terms while eating, which allows viewers to join them to talk about food and means that co-construction of taste and food assessments is achieved during mukbang interaction."



IN THE **CLOVER**

Materials engineers have taken inspiration from nature to devise origami-like microfluidic devices that can bend and fold in response to the environment, opening up a new space for exploring the potential and application of microfluidics.

he leaves of plants can spread under sunlight and fold in the cold. What if man-made materials could achieve the same response to environmental stimuli?

team has pre-set folds, like an origami sheet, that can respond to external

stimulation, breaking new ground in materials development.

A team from HKU's Department of Mechanical Engineering has tested that guestion by mimicking the ability of the clover plant to bend and fold. Their work is in microfluidics, which involves manipulating and processing tiny amounts of liquid that potentially could be developed for uses such as drug delivery, tissue engineering and environmental applications.

The microfluidic device they developed has pre-set folds, like an origami sheet, that can respond to external stimulation. Called TransfOrigami microfluidics (TOM) to emphasise the connection between transformation and the origami structure, the device has broken new ground in materials development and was featured on the cover of Science Advances journal.

"Traditionally, these chips have been made of elastomeric polymers like rubber, with small channels etched in to manipulate the flow of fluids into and through the channels so they can form, for example, very controlled droplets. But these materials are inert and nonresponsive and they have a passive role in regards to the channels," said Professor Anderson Ho Cheung Shum of the Department of Mechanical Engineering, who supervised the project.

"If you look at similar channels in nature, such as the microvasculature in leaves, they can change position in relation to light, humidity, temperature etc. Even in our bodies, materials are very active.

"So we asked, can we make a synthetic microfluidic device with liquid flowing through it, that could be similarly active like in a natural biological system?"

Turn to the light

Their device bends by contracting or relaxing in response to environmental stimuli. Dr Yi Pan, who led the team, explained how the device could respond to light.

"When the external environment is suitable for photosynthesis, for example on a sunny day, the device unfolds to promote photosynthesis. When the external environment is not conducive to photosynthesis, such as on a rainy day, it folds to slow down the photosynthesis," he said.

That responsiveness and movement could also make the chip worth exploring for other dynamic, flexible uses, such as artificial vascular networks and shape-adaptive flexible electronics.

"For example, the surface of the human body is mostly curved. If flexible electronics can deform in response to stimulus, that may help the



PROFESSOR ANDERSON HO CHEUNG SHUM

Previously, we could only think about how to design the channels of microfluidic devices. Now, this ability to affect performance by modifying the properties of the material used opens up a new parameter.

device transform better into the shape of the human body surface to improve the device's performance," Professor Shum said.

"Previously, we could only think about how to design the channels of microfluidic devices. Now, this ability to affect performance by modifying the properties of the material used opens up a new parameter, a whole new space for us to explore. We can make things more dynamic. This is a fantastic illustration of how humans can follow nature's inspiration to facilitate technological design."



Schematic drawing of the TransfOrigami microfluidics in its unfolded state when the temperature is high and light irradiates; folded state when the temperature is low and humidity is high. The insets show the schematic dehydration and hydration in the pNIPAM hydrogel layer of the actuating unit in the unfolded and folded states.

Adding to the repertoire

The changes induced may also indirectly cause a response in the chemistry inside the channel where the liquid is contained – the potential results and applications of which can now be investigated.

The TOM is part of ongoing work by Professor Shum's laboratory to explore the miniaturisation of the structures of droplets and jet-based platforms to improve or enhance their use in disease diagnostics and environmental monitoring and try to mimic biology.

Professor Shum, who recently was named President of the Hong Kong Young Academy of Sciences, has also been developing applications for his other research. For instance, he leads a major InnoHK laboratory, the Advanced Biomedical Instrumentation Centre, that has received several hundred million Hong Kong dollars to develop such things as affordable screening tests, personalised diagnostics, therapy approaches for new treatments, and advanced medical device components.

"I try to maintain a continuous flow of ideas in my group. Some of the more upstream things, like the TOM, we can work on at HKU and they give us a source of new innovations or ideas that we can apply in future. The TOM adds to the repertoire of tools we can use in future," he said.

FRACTURED VISION

A massive international study of hip fracture – one of the most common ailments affecting the elderly – has provided both a better understanding of the impact of demographic variation on osteoporosis and support for strategic policymaking in the management of ageing populations.

he project, which is the largest collaborative study of hip fracture ever undertaken and involved 400 million patients, was planned in 2019 and officially started in 2020. The global team of Amgen, a pharmaceutical company which makes antiosteoporosis medications, invited experts to help estimate the global burden of hip fractures in 19 countries and regions.

HKU was the coordinating centre of the whole study, led by Professor Ian Wong, Lo Shiu Kwan Kan Po Ling Professor in Pharmacy, Dr Ching-Lung Cheung and Dr Chor-Wing Sing from the Department of Pharmacology and Pharmacy, HKUMed.

"The Department's big data research is world renowned and has been attracting collaborations from the world," said Professor Wong. "This is not the first time we've led a global study on a disease's epidemiology – we have published several impactful global epidemiology studies, such as the NeuroGEN study in 2018, whose findings helped the world shape clinical guidelines and policy. We believe that our experience and reputation are key to attracting such collaborations."

Multinational studies are not uncommon for hip fractures but the scale is usually small. "And, while the Global Burden of Disease study (GBD) represents large-scale multinational research," continued Professor Wong, "it is also a modelling study using mainly reported summary data. Conversely, this study was based on the raw data obtained from large representative databases – for example, electronic medical records, claims databases, and national records – and therefore highly accurate."

Nineteen countries from across different continents – including Oceania, Asia, Northern and Western Europe and North and South America – were invited to take part to increase the representativeness of the study, with one of the criteria being that they have well-established healthcare databases for analysis. The team members have worked closely with most of the collaborators in previous multinational studies.

Secular trend

"We compared the secular trend of hip fracture incidence, one-year mortality after hip fracture, treatment rate after hip fracture, and

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projected number of hip fractures stratifying by age, sex, and study site," said Dr Sing. "Our study revealed that the secular trend of the incidence of hip fracture varies and one-year mortality rate after hip fracture across countries and regions, with most of them showing a decreasing trend.

"However, even though the trend is decreasing, this is not enough to offset the effect of the growing ageing population in many countries. We project that the hip fracture counts will likely double by 2050 compared with 2018, while there will be a larger proportional increase in men (vs women) and among people aged 85 years or above (vs other age groups)."

The study also revealed that the use of anti-osteoporosis medication after hip fracture is sub-optimal. "Even though international treatment



Dr Ching-Lung Cheung (left), Associate Professor, and Dr Chor-Wing Sing, Research Assistant Professor, of the Department of Pharmacology and Pharmacy, HKUMed.

PROFESSOR IAN WONG

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guidelines recommend the use of anti-osteoporosis medication following hip fracture, we found that the treatment rate after hip fracture is generally far below 50 per cent," said Dr Sing.

Sex disparity

"There is also an obvious sex disparity in hip fractures," said Dr Cheung. "Osteoporosis is commonly perceived as a 'woman's disease', and it is largely neglected in men. Men had a smaller decline in hip fracture incidence; higher mortality rate (19.2 per cent to 35.8 per cent in men vs 12.1 per cent to 25.4 per cent in women); and lower treatment rate than women by 30 per cent to 67 per cent across countries and regions. Although the incidence is obviously higher."

The team concluded that osteoporosis is an under-recognised and under-treated condition. "International experts call it 'the crisis of the treatment of osteoporosis;" said Dr Cheung. "Since it is a prevalent disease, together with the expanding global life expectancy, ignoring the importance of osteoporosis will lead to the increased risk of hip fracture. This is not only an issue for the patient, but also for the carers and for society, since hip fractures lead to an increase in healthcare expenditure, use of healthcare resources, dependency, and institutionalisation.

"Moreover, osteoporosis is commonly perceived as a 'woman's disease', that is the reason leading to the sex disparities in the secular trend of incidence of hip fracture. Similarly, the increase in the secular trend of incidence of hip fracture among the oldest old is also the highest compared with other age groups."

Having completed such a comprehensive study, the team is now calling for action in preventing hip fracture. "For example, by strengthening the current hip fracture programme including education, treatment, and fall prevention," said Professor Wong. "We further advocate considering other useful approaches that have been shown to reduce the risk of hip fracture, such as community screening for osteoporosis. A special focus on men and the oldest old should be emphasised, since these groups of people have shown the highest increase in the incidence of hip fracture in recent years."

RESEARCH

THE GREEDY GECKO TRADE

Tokay geckos are in seeming abundance in Asia, but high-volume trade in the species suggests there could be threats on the horizon. HKU scientists have been gathering evidence.

> Tokay gecko (Gekko gecko reevesii) on a tree in its habitat. (Courtesy of Dr Yik-Hei Sung)

okay geckos are an eye-catching reptile – large and colourful, and said to possess therapeutic benefits in traditional Chinese medicine (TCM). These qualities have made them high in demand both as pets and especially as an ingredient in TCM. But despite their ubiquity across Asia, the demand may be threatening their sustainability.

This is the conclusion of a study from the Conservation Forensics Lab of the School of Biological Sciences. Then-PhD student (now postdoc) Dr Pauline Dufour, under supervision of Dr Timothy Bonebrake and Dr Caroline Dingle of HKU and Dr Yik-Hei Sung of Lingnan University, conducted a detailed investigation of the impact of the gecko trade in Hong Kong and the origins of our local gecko population.

Millions of tokay geckos are exported from Southeast Asia every year and other evidence suggests they are being taken from the wild

because there are no breeding facilities large enough to support such a trade, nor would this be practically or economically feasible.

"Events of poaching at large and small scales can have major implications on the long-term survival of small populations and decrease their genetic diversity," Dr Dufour said. "Each individual gecko is cheap and not worth a lot of money, unlike a pangolin or other animal of high value. But that's one of the reasons why I think it is threatened. It's so cheap that people don't consider it to be a species worth protecting."

Lousy pets

Concern about the future of tokay geckos prompted their listing in 2019 under Annex Two of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, which means permits are required for their trade. Hong Kong subsequently listed them as protected under local legislation. But there is still open trade and open discussion of trading the species across borders.



Dried tokay geckos on stick for sale in Hong Kong.



DR PAULINE DUFOUR

Essentially, the demand for tokays in Hong Kong and China is resulting in exploitation in countries across the region.

Dr Dufour led an investigation that collected tissue samples of seven populations of geckos from the wild in Hong Kong and from dried individual geckos sold in TCM shops. She then did genetic analysis that found nearly all the TCM tokays originated from across Southeast Asia, not Hong Kong, which showed that they were being traded here. "Essentially, the demand for tokays in Hong Kong and China is resulting in exploitation in countries across the region," she said.

In the wild, she found two subspecies of tokay geckos – Gekko gecko gecko and Gekko gecko reevesii, with the latter genetically closer to populations in southern Mainland China. She also looked at the live pet trade, which is flourishing on places like Facebook, and talked to pet owners. One group of geckos from the wild that she looked at was genetically closely related to exotic geckos released in the wild in Florida, suggesting they were both exported from Thailand as a result of the international pet trade.

"Tokay geckos are very pretty but they're not good pets. They bite and it takes them a long time to get acclimated. If they are in an enclosure, they are probably going to attack each other because they're quite territorial," Dr Dufour said.

Unsustainable rate of exploitation

The geckos are popular in TCM for kidney and lung ailments and at one point were purported to be helpful against AIDS,

although this was later disproved. Dr Dufour said interviews with local shopkeepers found there has been no major increase in demand in the wake of COVID-19, although the price of tokay geckos has started to rise both in Hong Kong and the Mainland.

In any case, the protections in Hong Kong for tokay geckos are confusing. They can be bought and sold, both dead and alive. While it is not legally permitted to catch them in the wild, this is difficult to prove.

"The tokay gecko isn't necessarily a rare species," Dr Bonebrake said, "but the question is whether they will become rare because of the high rate of exploitation. That makes



The team working in the field, taking measurements and photographs of a tokay gecko.

it a challenge in conservation. One of my concerns is that the current rate of exploitation is likely not sustainable unless we do something about it."

Dr Dufour called for greater collaboration across borders to manage the tokay gecko trade before it is too late and that the weight of responsibility should not be loaded onto Indonesia and other developing countries.

"Some countries have regulations in the pipeline. And in Mainland China it's now listed and there is technically protection in Hong Kong. Hopefully these changes will start to have a positive impact," she said. Her findings also provide a baseline for future monitoring.

THE **SAD PLACE**

wo decades ago, Professor Tatia Mei-chun Lee, Chair Professor of Psychological Science and Clinical Psychology and May Professor in Neuropsychology, was puzzled by a patient's symptoms. The man had suffered from acute liver failure and undergone an emergency liver transplant. Several months later, he began to experience pathological crying – he would cry over situations that previously never phased him and he could not control the crying. Findings of an MRI scan of his brain identified lesions in an area of the brain about which hitherto little had been written: the pons.

The pons is located at the bottom of the brain, in the brainstem. Until about a decade ago, most fMRI brain research looked at the cortical rather than the brainstem regions because of a resolution trade-off, and also a common assumption that the upper brain areas were where cognitive functioning took place.

However, as technology has caught up, it has enabled Professor Lee to investigate the pons more thoroughly. Since 2015, she has published several studies about the pons, including a recent one showing its role in depression. The findings are an important contribution to public health.

"Mood disorders and stress-related disorders are a significant health threat, as identified by the World Health Organization. The more knowledge we have about the mechanisms involved, the better we will be able to understand how we can manage these disorders," Professor Lee said.

Eliciting responses

Her first groundbreaking study in 2015, in which she worked with Peking University, used a 3 Tesla scanner to conduct fMRIs of people's brains as they looked at pictures meant to elicit an emotional response, Professor Tatia Mei-chun Lee and her team have identified areas in the brain highly related to the intensity of depressive symptoms and shown that greater connectivity in these areas is associated with more intense depressive symptoms.

such as a happy baby – called affective stimuli. The resulting brain images substantiated her instinct about that long-ago patient.

"First, we confirmed that when people were looking at affective stimuli, the pons did activate. And second, we identified a structural connection between the pons and the corticolimbic area, particularly the hippocampus, which was associated with affective regulation," she said.

With that connection identified, they began a second study to see if there were any connections between the pons and the eyes. Other researchers had found such a link in animal studies, as well as impacts on human mood through visual stimulation, such as light therapy. Professor Lee and her colleagues were able to use fMRI to identify a bundle of fibres related to the eye that were connected to the pons region.

Her most recent study, published this year with Professor Lin Chen of the Chinese Academy of Sciences, used a more powerful 7 Tesla fMRI scanner to look more closely at activity in the small structure of the brain, particularly among people who are depressed. A connection was confirmed between the pons and the amvadala, which is involved in processing affectively negative stimuli. But most importantly, only clinically depressed people demonstrated hyperactive amygdalapons connectivity. Furthermore, this connectivity was shown to be a significant indicator of depression in these patients and the severity of their symptoms.

Dysfunctional connection

"The strength of this connection was positively associated with the severity of depressive symptoms," Professor Lee said. "We speculate that the pons interacts with the amygdala to perform signal exchanges after receiving affective information. A specific sadness-processing



The more knowledge we have about the mechanisms involved, the better we will be able to understand how we can manage these disorders.

connection between the amygdala and pons appears dysfunctional among people with depression. These findings offer important insight into the potential mechanisms underpinning the manifestation and maintenance of depression."

Taken together, the findings suggest visual stimulation may be an avenue for further research to identify more precise interventions for depression

Professor Lee, who was elected a Fellow of the Academy of Social Sciences in the spring, is one of the very few scholars worldwide looking at how the pons interacts with other brain regions to regulate emotion. Her pursuit of this research is part of her overall goal of producing a more complete picture of the affective regulatory system in the brain.

"If we can identify certain activity pathways or connectivity that help mark disease or mood problems and the severity of behavioural problems associated with that, we could then target intervention and look to see if we can revert the marked pathway or neural activities. rather than simply relying on self-reports from the patients," she said.

PROFESSOR TATIA MEI-CHUN LEE



The team has turned the Kai Choi School into a community space for the Kuk Po Vision exhibition.

A project to revitalise and protect the abandoned village of Kuk Po is adopting innovative rural strategies for architecture, landscape and community to achieve cultural and environmental renewal.

uk Po village and the surrounding valley lie next to the sea facing China's lindustrial conglomerate Shenzhen. It has been largely empty for decades as villagers left rural life for the city. More recently though, their descendants are showing renewed interest in Kuk Po and the task of realising a revitalisation vision has fallen to the Faculty of Architecture, under the leadership of Professor Wang Weijen, and sponsored by the Countryside Conservation Office.

"This valley was originally a natural bay, then it was developed into agricultural land by early Hakka immigrants and became paddy fields," said Professor Wang, who is Andrew K F Lee Professor in Architecture Design and Head of HKU's Centre for Chinese Architecture and Urbanism. "More recently – partly due to border zone restrictions, lack of infrastructure

and no vehicular access – villagers began to leave, the school closed and the area gradually turned into mangrove swamp and natural wetland, now zoned as conservation land. With few residents remaining, it's dotted with abandoned houses in various states of ruin and now interwoven with nature."

Topmost in Professor Wang's approach was how to preserve not only the natural landscape and wetlands but the cultural landscape too. "Architecture students spent over a year surveying and creating drawings of the traditional houses and the landscape. And then we began an 'acupuncture approach' – going point-to-point, asking where the opportunities are to make small improvements, and what the villagers want, coordinating experts, then moderating progress and looking after the environment as we go."

The vision so far has included activating the reuse of Kai Choi School and temple, a heritage building, which the team has turned into a community space for an exhibition and forum to help attract interest in the Kuk Po Vision. "In parallel with the exhibition, we also curated two outdoor installations interacting with the natural landscape: the Tidal Stools (clay constructions) on the beach, and the Field Theatre (wood constructions) along the embankment, looking at both the sea and mountain," said Professor Wang.

The next step is to establish a Village Common Room by renovating an annex building of the school into a community centre, adding an eco-toilet, and creating a village entrance patio as a public space. "We also want to conserve several ruin houses - houses where trees have grown through the building, leaving a beautiful



The Kuk Po Vision exhibition displays the valley's transformation of wetlands with its ecological diversity, the typological evolution of village houses and settlements, as well as the collective memory and aspirations of the community.

composition of nature and construction - into 'Ruin Gardens' with some new facilities like paving, seating, and a pavilion for visitors. The emphasis for the whole vision is very much on preserving and enjoying what is there," he said.

Tidal Stools

Earlier this year, 30 Tidal Stools were installed in Kuk Po's wetlands. "This seaside seating not only serves as an art installation but the stools are also designed to encourage small marine lives to hide between the spaces," said Associate Professor Christian Lange, Head of Architecture's Robotic Fabrication Lab. "During high tide, the stools are partially submerged in the water. During low tide, they invite the villagers and visitors to take a break and enjoy the beach."

Working with a team of students, Mr Lange designed the stools inspired by traditional Chinese round chairs and the roots of mangrove trees. "We also took advice from marine biologists to draw up geometric shapes, and used algorithms to make them more complex before printing the ceramic clay shapes, layer by layer, using 3D technology."

"As a teaching and learning tool for Architecture students, the project addresses issues of how to generate novel dynamic and active architectural landscapes with computational design methods and innovative material systems in conjunction

with an ecologically-aware design approach," added Mr Lange. "We had students and research assistants involved at the design and manufacturing phases. They were able to participate and learn all aspects from conceptual design phase to robotic programming and material handling."

Field Theatre

The Field Theatre project was created to help visitors revel in the landscape from a new perspective. Assistant Lecturer Tianying Li and Adjunct Assistant Professor Su Chang, working with Professor Wang, led their students to design and create wooden viewing structures encouraging people to orient their bodies towards the surrounding landscape.

Ms Li describes the technique as, "conceiving architecture as a tool to establish our bodily relationship to geography, as well as its efficacy to help humans make sense of the secrets and potentialities of the territory."



Tidal Stools were installed in Kuk Po's wetlands, serving as an art installation and also designed to encourage small marine lives to hide between the spaces. With this seaside seating, villagers and visitors can take a break and enjoy the beach during low tide.



PROFESSOR WANG WEIJEN

The emphasis for the whole vision is very much on preserving and enjoying what is there.

> Practical lessons for the students included the design of the wooden structures and overcoming the challenge of Kuk Po's remote location, with limited access via small boats only. "They decided to make prefabricated structures," said Ms Li. "We chose the most lightweight material of standardised woods, commonly found in Hong Kong and workable on-site. The designs were partly informed by the maximum weight a single person can carry and the size of the boat."

Some of the structures were placed half a metre above Kuk Po's linear concrete water dam, the extra height elevating people above the dense plants surrounding them. Others were placed near trees. "Fascinated by the various postures of the trees, our structures reacted accordingly," said Ms Li. "They simulated adjacent trees while keeping a minimum touch on the ground and on the trees, thereby becoming performers in the theatre of the landscape."



 n the summer of 2019, Dr Peter J Cobb, a joint appointee of the Faculties of Education and Arts, decided to create a course around his archaeological fieldwork in Armenia. The idea was that HKU students would travel to the country the following summer to help with the excavation and learn about archaeology. The pandemic put those plans on hold in 2020 and 2021, but this year, despite the fifth COVID-19 wave, he successfully made use of technology to bring students virtually to the site - and even

welcomed some adventurous ones who travelled there in person simply for the experience.

"I wanted students to learn about space in the past and how buildings and paths are laid out and relate to each other," he said. He organised two course-based programmes, one that took students virtually around 3D models of Armenian and Iragi sites that he created with the Faculties of Engineering and Architecture, the other that involved some students on-site

and others in Hong Kong providing technical support.

When face-to-face teaching halted during spring, students in his introductory course to Mesopotamian archaeology used virtual reality (VR) headsets and sensors that allowed for the avatars of the teacher and students to interact in the virtual world even when they were in separate buildings in real life. The students were tasked with using archaeological evidence to create their own 3D models and write up Wikipedia entries on their chosen sites.

More hands-on work took place in the second programme in summer as pandemic restrictions eased. Some students chose to join Dr Cobb in Armenia as volunteers, while others in Hong Kong officially registered in his summer class. The collective output of both

groups contributed directly to knowledge about the site.

"Everybody had something to do as part of their undergraduate research. The people in the field were doing physical digging and recording their finds and the people back in Hong Kong were focussed on digital work and creating 3D models of what was dug," he said.

Livestreaming it

Students in Hong Kong attended weekly Zoom tours of the trenches led by students on-site. Dr Cobb also experimented with a 360-degree camera through which students in Hong Kong could 'walk' around the site and see things from different angles. The camera was linked to a suite in the Tam Wing Fan Innovation Wing of the Faculty of Engineering. There were some teething problems, given slow internet at the site, but they were able to get it up and running. "I don't know of anyone who has tried to use a livestreamed 360-camera on an archaeological site before," he said.

The on-site students - who included several of Dr Cobb's research postgraduate students from Education and undergraduates from Science, Arts, Architecture and Social Sciences had to dig, clean, sort and take hundreds of photographs of their finds and collect the coordinates of each location using a global navigation satellite system. This information was sent to the students in Hong Kong, who used it to create precise 3D models of each context where objects were found. Altogether, more than 100 of these models were constructed during the summer.



Students from the Emerging Societies: An Introduction to Mesopotamian Archaeology course visiting a 3D reconstruction of a temple virtually.

"The goal here is to make a kind of perfect 3D puzzle of intersecting context volumes that shows us the excavation of the trench, including where things were found and the relationship between the walls," Dr Cobb said. "Archaeology is a destructive science and the only way to reproduce the experiment is to have the data available. With our dataset, other scholars can now 're-excavate' the site and apply different research questions to that data." He is collaborating with researchers from the Faculty of Engineering to apply data science methods to the digital data collected.

Part of it

Students were enthusiastic about the experience, especially those who travelled



DR PETER J COBB

The people in the field were doing physical digging and recording their finds and the people back in Hong Kong were focussed on digital work and creating 3D models of what was dug.

to Armenia. Ye Xinyi, a fourth-year Bachelor of Arts (Art History and Music) student, said the fieldwork was physically and intellectually demanding, since they worked under a hot sun in a remote area. "But the idea that I am the first person to touch these incredible objects after they have been buried in the ground for perhaps 1,000 years gave me goosebumps."

Claudia Ko Hiu-kwan, a recent Bachelor of Science (Chemistry and Biochemistry) graduate, appreciated the chance to learn more about ancient culture and material culture. She excavated in the trenches and helped with the ceramic analysis process in the laboratory. "I felt part of the archaeological team and this motivates me to continue my journey in this field."

Charlotte Lam Hei-man, a fourth-year Bachelor of Science (Biochemistry) student, remained in Hong Kong creating models and supporting field members. Nonetheless, the VR sessions made her feel included in the dig. "I learned that archaeology is not just about fieldwork but draws knowledge from various disciplines, even from maths. Everyone from any speciality can contribute."



Students from the Cultural Heritage and Information in the Field course using virtual reality (VR) headsets in a VR class session.

FROM LANDSCAPETO LAPTOP

Teaching landscape architecture when you can't get out into the landscape could be something of a stumbling block. But solving that problem during COVID-19 lockdown has led to the creation of the Digital Arboretum, a new resource with long-term value. Field trips form an integral part of Mr Gavin Coates' landscape architecture teaching. Since face-to-face teaching has been interrupted for some time because of the COVID-19 lockdown, he tried to run field trips remotely, primarily by means of videos.

he Digital Arboretum (DA) is the brainchild of Mr Gavin Coates, Senior Lecturer at HKU's Division of Landscape Architecture. "Teaching planting design, landscape technology and landscape representation are my specialities and, for all of these, taking groups of students around the city and the countryside is key. On field trips, they're not just seeing the plants, but learning to experience, understand and read the landscape," he said.

With COVID-19 in 2020, that all shut down overnight. With students in quarantine lockdown at home, Mr Coates started doing field trips on his own, and recording them on his phone. Initially, he put the videos on Facebook Workplace sites.

"They proved very helpful as students could not only watch but rewatch and concentrate on parts they missed the first time," said Mr Coates. "It really helped them with learning the botanical names. In fact, in some ways, it worked even better than a field trip because if you have a big group, the ones at the back may not be able to see the particular plant I'm referring to – with a video everyone gets a close-up!" He made hundreds of short videos, spanning rural and urban Hong Kong, the outlying islands and the New Territories. They quickly became a useful teaching resource for which he was awarded an HKU Teaching Innovation Award in 2020. He then began to consider their longerterm value as a potential online database detailing Hong Kong's rich diversity of trees and plants online so that they would be accessible and retrievable at any time for students and a wider audience.

IT knowhow

He applied for a Teaching Development Grant "to hire some younger people with IT knowhow", including Mr Tim Pit Hok Yau, a recent graduate of HKU's School of Journalism. Support also came from HKU's Digital Literacy Lab, Technology-Enriched Learning Initiative and the Centre for Applied English Studies in advisory and technical capacities. "I designed it on paper, and they made it happen."

Much of the content at the moment comprises Mr Coates' original phone videos, but this term that will change. "We're expanding and one of the assignments for students will be to make videos for the DA," he said. "It's an experiment – we will be careful to maintain quality control and the emphasis will be on making sure the videos are accurate, informative and interesting."

The DA comprises three main sections – the Plant Database, with images and videos of more than 245 plant species, listed alphabetically by their botanical names. If you are not sure what you are looking for, there are multiple ways to search, ranging from 'usual habitat' and 'foliage colour' to the more landscape design-oriented 'design function' – such as 'street tree', 'shade tolerant', and 'native' or 'exotic'. Click on a particular plant and up comes a list of its basic characteristics, plus a selection of videos relating to it and the date and location where each video was made.

The second section, Location, features maps of Hong Kong dotted with numbers which link to virtual field trips and the locations in which Mr Coates filmed. Click anywhere on the dots or the route indicated and up come related videos.



The Digital Arboretum is an online resource featuring hundreds of videos on trees and other plants which offers a wealth of information and engaging commentaries recorded out in the field, in Hong Kong's disparate urban and rural landscapes.



MR GAVIN COATES

The Digital Arboretum is not meant to be a botanical treatise, it's not about how many stamens a plant has. As landscape architects, we focus on how plants are used functionally in a design sense, how they naturally populate the landscape and how they contribute to the local ecology.

The third section, Special Features, includes a gallery for displaying and archiving student assignments, including drawings of tree sections, and 'Tree Metaphors', the fruit of Mr Coates''Nature in the City' Common Core course.

Geographical expansion

The next developments are likely to involve both geographical and multidisciplinary expansion. "While in the United Kingdom in August, I put up videos of English oak trees at various stages of their life-cycle," said Mr Coates, "and the potential for uploading information from around the world and turning the database into a global teaching resource is huge."

He is looking into collaborating with other universities and plans to send the Digital Arboretum to institutions such as Kew, Harvard Arboretum *etc*, and to invite other related organisations to contribute their own videos. "The project could serve as a model reference and teaching approach for other disciplines with a significant field trip component such as biology, botany and geology," he said.

But, at the same time as he discusses expanding the database, Mr Coates is also careful to emphasise the original aim behind the project. "The Digital Arboretum is not meant to be a botanical treatise, it's not about how many stamens a plant has. This is a tool to help you achieve something in landscape design: How fast will this grow? How tall? What will grow next to it? Is it a good screening plant?

"As landscape architects, we focus on how plants are used functionally in a design sense, how they naturally populate the landscape and how they contribute to the local ecology."

Learn more about the Digital Arboretum



KNOWLEDGE EXCHANGE

THE EYES HAVE IT

The HKU Eye Centre opened in July, providing space not only for research and teaching activities, but also charitable work to serve people in need.

The mission of the HKU Eye Centre is to conduct cuttina-edge clinical and translational research in ophthalmology, to deliver professional and patient-centred ophthalmic care, and to provide high-quality clinical training to HKU medical students and postgraduate students.

ataracts are a common disease of the eye affecting vision especially among older people. The problem is easily cured, but in Hong Kong the wait for cataract surgery in the public health system is among the longest in the developed world, at three to four years. During that time, vision gets worse.

Now, two initiatives launched through the new HKU Eye Centre, operated by the Department of Ophthalmology, will provide some relief to patients most in need.

With funding support from Sun Hung Kai, the HKU Eye Centre is providing free eye examinations and cataract surgery to socially disadvantaged patients identified by the Hong Kong Sheng Kung Hui Welfare Council, with the aim of providing about 500 cataract surgeries.

And by the end of the year, the HKU Eye Centre will launch a oneyear programme with Orbis, a non-governmental organisation with international programmes focussed on the prevention of blindness and the treatment of blinding eye diseases, to provide eye checks to about 3,000 residents living in public housing estates across

Hong Kong. This will also give researchers an idea of the prevalence of blindness and other eye diseases such as glaucoma, using technologies developed at HKU.

"We can examine these patients with advanced ophthalmic investigations and at the same time the investigation results will benefit our research," said Professor Christopher Leung Kai-shun, Head of Ophthalmology.

New centre is a catalyst

The catalyst for these initiatives has been the opening of the new HKU Eye Centre near Wong Chuk Hang MTR station, which has three consultation rooms, two operating theatres, an opticians' area and high-end equipment that is being used to pursue impactful translational research. The centre consolidates the work of ophthalmology at HKU in ways that were not possible before.

"We used to be scattered across different areas of southern Hong Kong to provide ophthalmic care for our patients, but now we have our equipment and staff mostly in one place. We are now able to combine



We can examine these patients with advanced ophthalmic investigations and at the same time the investigation results will benefit our research.

resources not just in terms of hardware and manpower, but also patients," Professor Leung said.

Ophthalmology is a relatively new speciality in the Li Ka Shing Faculty of Medicine and only became its own department in 2012. Teaching, research and patient care have taken place at Grantham Hospital. Queen Mary Hospital and Gleneagles Hospital (for private patients) and while these activities will continue, the HKU Eye Centre consolidates research in particular and gives the Department more autonomy in research and charity programmes.

For instance, it has developed a new tool, called ROTA for Retinal nerve fibre layer Optical Texture Analysis, that can measure the trajectories and optical texture signals of nerve fibres in the eye, which is important for diagnosing glaucoma and other forms of optic nerve diseases. This has been patented and is being licensed to other parts of the world.

They are also working with Topcon Corporation of Japan to look at small vessels of the eye, the outcome of which could have implications beyond ophthalmology. "If the small vessel becomes blocked, you can have a stroke of the eye, just like you might have a heart attack or stroke when a major artery is blocked. In years to come, we hope



The HKU Eye Centre is equipped with state-of-the-art facilities, including optical biometry, cornea/anterior segment optical coherence tomography and 3D digital surgical microscope.

PROFESSOR CHRISTOPHER LEUNG KAI-SHUN

to look at whether there is potential in developing this technology as a biomarker to predict who might develop cardiovascular or cerebrovascular diseases. The eye is the only organ where we can visualise the blood vessels and nerves in vivo, meaning without any cutting or dissection," he said.

Teaching benefits

The HKU Eye Centre uses its advanced equipment to benefit patients from all walks of life. Its academic staff have both public and private patients, as well as charity patients.

Teaching will also be supported at the centre. Professor Leung said the Department recently entered into a collaboration with Kowloon East cluster that will give students exposure to patients from a broader socioeconomic spectrum than they might find on Hong Kong Island South. "We expect the diseases may be more severe or they will have more complicated types of disease and other medical conditions," he said.

He noted this was the first HKU clinical services centre outside campus not affiliated with a hospital. This is possible because 95 per cent of ophthalmic surgeries are performed in day-care centres. "A cataract surgery, for instance, is a relatively straightforward procedure nowadays and takes 10 or 15 minutes. We can generate this kind of immediate impact," he said.

Getting the HKU Eye Centre and various programmes up and running has been a whirlwind ride for Professor Leung, who joined HKU in March 2021. He said it would not be possible without the support of HKUMed, HKU's Estates Office and Finance and Enterprises Office, and Sun Hung Kai. "This has really been a huge opportunity," he said.

> Learn more about the HKU Eye Centre



SNUFFING OUT **ALTERNATIVE TOBACCO** PRODUCTS



WARNING!

WARNING!

-cigarettes and other ATPs have presented a challenge when it comes to controlling tobacco use. On the one hand, in the United Kingdom, the National Health Service touts them as a stepping stone to guitting traditional cigarettes. On the other hand, the World Health Organization has declared them to be harmful to health.

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Research by HKU's School of Nursing has helped provide definitive evidence in that debate and shown that ATPs can be most definitely harmful to health. Their work

convinced the Hong Kong government and legislators to ban their import, promotion, manufacture and sale here as of April 30, 2022.

"We have been very worried about e-cigarettes and other ATPs because we find many new smokers are starting to use these. Our research findings show that ATPs cannot help with quitting and may actually be a barrier for smoking cessation. Their use is also associated with respiratory risks or symptoms in adolescents and children," said Dr Kelvin

Wang Man-ping of the School of Nursing and one of the leaders of the smoking cessation research team.

WARNING!

WARNING!

WARNING!

WARNING!

In fact, the synthetic chemicals used in e-cigarettes can penetrate deep into the lung, causing inflammation and getting trapped there. This can cause permanent damage in young smokers, he said.

The School's work on ATPs is part of a two-decade long programme that includes providing research, outreach and policy



'Tobacco Endgame: Zero Hazard · Smoke-free Generation' publicity programme to echo the World No Tobacco Day on May 31 and World Health Organization's appeal to draw global attention to the tobacco epidemic and the preventable death and disease it causes.

advice on tobacco control to reduce the harm caused by smoking.

Hardcore smokers remain

While Hong Kong has one of the lowest smoking rates in the world, at 9.8 per cent, that still amounts to about 600,000 people. "This is still a big health problem. Smoking in general will shorten life expectancy by 10 years. One in two smokers will die prematurely and for smokers who start at an early age, two out of three will die early," Dr Wang said. "But it is difficult to get the hardcore smokers to guit."

That has not stopped the School of Nursing from trying. They have worked with the School of Public Health to regularly survey students in more than 200 primary and secondary schools and conduct other surveys of adults over nearly 20 years to monitor their tobacco use and exposure. The findings have, among other things, confirmed that increased taxation on tobacco products reduces youth smoking and that respiratory symptoms are similar between cigarette smokers and e-cigarette users and highest among dual users. Surveys of both youths and the general population confirmed that e-cigarettes do not help people guit conventional cigarettes.

What does help people quit, the School has found, is proactive outreach. Its smoking cessation research team recruits smokers to try out interventions and sustains contact with them through WhatsApp in the annual



Quit-to-Win campaigns organised by the Hong Kong Council on Smoking and Health. Targeted outreach programmes have also been successfully implemented for new fathers and women smokers, and in hospital emergency rooms.

the clinical setting. But in the community, smokers are not that ready to guit, they're opportunities to help this group guit," Dr Wang said.

Toward a tobacco endgame

The team is working on multiple large-scale randomised controlled trials to advance the effectiveness of smoking cessation interventions, including providing shortcourse nicotine replacement therapy, an artificial intelligence chatbot, and real-time assessment of smoking behaviours. The team's impact in promoting smoking cessation in the community was selected by the University Grants Council to be presented to the public in promotional videos and awarded the American Academy of Nursing's Edge Runner 2022.

The School has also been active in applying evidence to support tobacco control policies. Its work was cited by the government in its proposals for tobacco taxation, extensions of smoke-free areas and the e-cigarette ban.

There is now talk of a 'tobacco endgame'. The common consensus here and around the world is that once tobacco use gets to five per cent or less in the population, then legislation can be introduced to ban it. Options could



DR KELVIN WANG MAN-PING

Our research findings show that alternative tobacco products cannot help with quitting and may actually be a barrier for smoking cessation.

"This is unique in the world because most research on smoking cessation focusses on still healthy. We are pioneering in grabbing

include a 'smoke-free generation' in which cigarette sales are banned to anyone born after a certain year, dramatically increasing tobacco tax, banning smoking in all places, gradually banning the sale of tobacco products and other measures. "But it is very challenging to further reduce Hong Kong's smoking rate by another 4.8 per cent in a short time period," Dr Wang said.

However, advocates have one thing on their side: "The tobacco industry is an obvious enemy. It's pretty rare to have this in public health. The tobacco industry is lobbying everywhere around the world. We are like small people coming up against a giant." But sometimes, small people win.



Tung Wah Mobile Smoking Cessation Clinic provides assessments and medications for smoking cessation, encouraging smokers to take the first step toward a smoke-free lifestyle.

KNOWLEDGE EXCHANGE

HATCHING A PLAN

The Hong Kong oyster broods used to raise the HKU Super Oysters.

The oyster industry in Hong Kong and southern China is suffering mortality of its stock due to pollution, climate change and encroachment on breeding grounds. HKU is leading an initiative that brings industry, government and scientists together to address the problem and improve sustainability.

ong Kong and southern China produce more than 30 per cent of the world's edible oysters, largely using a species endemic to Hong Kong (*Crassostrea hongkongensis*) that is popularly called the Hong Kong oyster, as well as indigenous aquaculture practices that have been in place for more than 700 years. Unfortunately, the future has been looking dim for this industry that is rich in tradition.

Oysters grow at river mouths where saline and fresh waters mix. But pollution from land sources, climate change impact, and land development and reclamation have diminished their traditional growable areas. Growers in Lau Fau Shan in Deep Bay, where Hong Kong's oyster farmers are largely based, have seen massive annual die-offs of up to 80 per cent of their oyster stock. These conditions have pushed growers to take their oysters to the limit in terms of where they can live. As a result, their stock cannot grow as fast as that of their counterparts elsewhere living in more comfortable estuarine environments, according to Dr Thiyagarajan Vengatesen of the Swire Institute of Marine Science (SWIMS) and School of Biological Sciences.

However, this year, a new initiative was formally launched that looks set to improve the industry's long-term outlook.

Building confidence

The Hong Kong Oyster Hatchery and Innovation Research Unit, which is headed by Dr Vengatesen, has brought scholars, the oyster-growing industry and the Agriculture, Fisheries and Conservation Department (AFCD) to develop new hatchery technologies for the industry, as well as a new, heartier'seed' called the HKU Super Oyster Seed. AFCD is providing HK\$5.28 million in funds through its Sustainable Fisheries Development Fund and Lee Kum Kee Company Ltd has provided HK\$3 million for this knowledge transfer.

The first task for the hatchery unit is to address the fact that there are no hatcheries in Hong Kong, where growers have relied on seeds from the wild or sometimes from Mainland hatcheries. In both cases, they are unsure of the quality of the seeds, which has increased financial risk.

Dr Vengatesen said they will provide growers with the technologies and skills needed to hatch their own seeds. "Because they don't have control over the quality of supplies at the moment, it affects their confidence when selling their products. They also do not have a sustainable supply of seeds. But they have not had the technology or a model to follow to set up their own hatchery.

"We are developing this model for them and this will also be a model for southern China. Because Hong Kong is a small place, it is possible to bring together the growers and scientists and government and develop a model that can work well around the world, particularly in Mainland China," he said.

Using local oyster seeds, the model recently developed at HKU will produce about 10,000 strings of oyster seeds each year, with each string holding 200 good-quality and fast-growing oysters. The hatchery is expected to be fully up and running within two years.

Making a new seed

Dr Vengatesen has also incorporated the hatchery into teaching and learning to inspire student entrepreneurs. One group has already developed a typhoon-proof raft for aquaculture in general and received funding to create a start-up company.

That still leaves the question of sustainability for the oysters. It takes time to develop new strains, but Dr Vengatesen said they are nearly



At the kick-off meeting of the Hong Kong Oyster Hatchery and Innovation Research Unit, hatchery and aquaculture experts, and representatives from the local oyster industry, government agency and other stakeholders gathered to discuss the sustainability of oyster aquaculture in Hong Kong.



DR THIYAGARAJAN VENGATESEN

Because Hong Kong is a small place, it is possible to bring together the growers and scientists and government and develop a model that can work well around the world, particularly in Mainland China.

half-way through the process of producing the HKU Super Oyster Seed.

The aim is to develop a seed that produces oysters capable of growing in a more extreme environment and able to thrive beyond their increasingly restricted traditional grounds. The hope is that within the next two to three years, the seeds will be ready for commercialisation.

"Once growers learn the hatchery technology from us and establish more hatcheries, they will then have this HKU Super Oyster Seed that they can use to take their hatcheries to the next level. We believe it will be highly commercially valuable not just for Hong Kong, but also southern China," he said.

The hatchery has started holding workshops for growers. Dr Vengatesen said he hoped it will spur further eco-entrepreneurship opportunities for student entrepreneurs and others to support the oyster industry. "The stakeholders have had an impact on this hatchery not just for research, but also teaching and innovation. Together we will make an impact on growers' livelihoods through modernising this industry with our research," he said.



Representatives from the Agriculture, Fisheries and Conservation Department of HKSAR visiting the Hong Kong Oyster Hatchery.



An initiative to bring mindfulness to schools has proven such a success – and, in the COVID-19 era, so crucial – that it has been expanded for another three years to include not only teachers and schoolchildren but parents too.

nen the Jockey Club 'Peace and wareness' Mindfulness Culture in Schools Initiative began in 2019, COVID-19 had not appeared on the scene. But the challenges the pandemic has wrought on the mental health of our community – especially youth – have made it both timely and essential.

Funded by the Hong Kong Jockey Club and organised by HKU's Faculty of Social Sciences, the project, called JC PandA for short, was begun with the aim of bringing mindfulness to the education sector and has since benefitted more than 3.000 students from more than 36 schools. It has also provided mindfulness training to teachers and to caring professionals, such as educational psychologists, social workers and counsellors, to equip them with stress-coping skills and prepare them to teach mindfulness. They are also encouraged to include mindfulness in the repertoire of their teaching and services.





Professor Shui-fong Lam (left) and Educational *Psychologist Mr Denis Kwan introducing resources* of IC PandA

Project Director Professor Shui-fong Lam explained the concept. "The lineage in our programme stretches back to the secular mindfulness advocated by Jon Kabat-Zinn in the early 1980s, who said 'mindfulness is the awareness that arises by paying attention on purpose, in the present moment, and non-judgmentally.' In mindfulness practice, we focus on the present moment by paying attention to our breath and bodily sensation. By doing so, we can be spared from worrying about the future or ruminating about the past. Worrying about the future is related to anxiety and ruminating about the past is related to depression – this is why mindfulness practice can ameliorate both."

Regarding the extra element of stress that COVID-19 brought into people's lives and how they affected the project, she said: "Our team was able to face the challenge and be flexible. In early 2020, when COVID-19 arrived, we immediately turned all our training courses for teachers into Zoom teaching. We also had a journal paper reporting the effectiveness of our training in building teachers' resilience during the most difficult time in Hong Kong. The data clearly showed that mindfulness can help people cope with adversity."

To empower the general public to use mindfulness to cope with the pandemic, the team has also developed a resources package (www.jcpanda.hk/ms2020/en) in which audio instructions on mindfulness practice techniques are offered in English, Cantonese and Putonghua. The resources package was

well received and has been browsed over 150.000 times.

The decision to continue and expand JC PandA was made in late 2021 when the end of Phase I was looming large. "In reviewing what we had achieved in three years, we were gratified," said Professor Lam. "However, we could also see that there was still much unfinished business, as the demand for our services is huge."

Major expansion

There are four main areas of enhancement for Phase II, including major expansion that will increase the number of schools served from 36 to 84. "This constitutes about 9 per cent of the public schools in Hong Kong, which is a substantial percentage for the initiation of cultural change," said Professor Lam.

"Second, we shall also extend our services to parents, with mindful parenting courses to help them take care of themselves and their children with mindfulness. Third, we shall work with school teachers to integrate mindfulness into different subjects, such as language, social studies, music and physical education.

"Finally, we intend to concentrate further on our 'train the trainers' approach and provide training to school teachers and helping professionals. We hope that they can teach mindfulness courses to their students or integrate mindfulness into the repertoire of their services."

Training the trainers is a capacity-building strategy. It strengthens the systems and makes the impact sustainable. "The positive feedback from our partner schools in the past



Mindfulness training for teachers.



PROFESSOR SHUI-FONG LAM

The positive feedback from our partner schools in the past three years has convinced us that our efforts are not in vain. Students benefit the most when the adults around them can teach them mindfulness mindfully.

three years has convinced us that our efforts are not in vain," she added. "Students benefit the most when the adults around them can teach them mindfulness mindfully."

Undergraduates also play an active role in the project, being recruited as research interns who can attend the mindfulness courses and have first-hand experience in the implementation of mindfulness research and intervention. "In the next year, we shall offer mindfulness training to clinical and educational psychology trainees," said Professor Lam. "Hopefully, it will help their professional development and empower them to use mindfulness to serve their future clients."

Asked what she hopes to achieve in the next three years, Professor Lam said: "I hope to mobilise and empower the existing resources of the systems and make mindfulness culture sustainable in schools in Hong Kong."





Faculty of Education 教育學院

THE **MIX MASTER**

Professor Rui Yang, the new Dean of Education and an expert in comparative education, hopes to see greater blending of Chinese and Western academic traditions and philosophies in his Faculty and in higher education in general.

ong Kong, China and much of the non-Western world have one thing in common: they have embraced the Western idea of a university, where English is the lingua franca and modern academics pursue the goals of speaking truth to power and serving the economy.

To the new Dean of Education, these are all important goals, but they do not allow for local variations nor recognise that the people operating in these systems, in places like Hong Kong and China, come from different cultures to the American and European traditions embedded in universities.

"I joke to colleagues that their rational selves are Western, but their emotional selves are Chinese," he said.

His aim as Dean – also outlined in his new book, The Chinese Idea of a University: Phoenix Reborn – is to encourage recognition of the traditions and values of both approaches and to promote research into the Hong Kong education system's relative success in producing students who can navigate both paths.

"Hong Kong is unique. You come across young kids who can engage equally well in ancient Chinese history and poetry and ancient British history and poetry. You won't find students who can do this so easily in China or Japan. So Hong Kong is in a unique position. Yet very little theoretical work has been done on why this is so," he said.

"I want our faculty to theorise and understand the factors behind the excellence of the Hong Kong model that we can hopefully apply more broadly to education."

Cultivating character

Professor Yang brings to these aims a deep background in comparative education across different cultures. He became a lecturer aged 24 in China, came briefly to HKU in the mid-1990s to launch his PhD studies, then went to Australia which allowed him to bring his wife and daughter and where he worked in universities until 2008. That year, he returned to HKU, attracted by the East-West interface and the quality of resources here.

His research has explored the dimensions of East-West integration, culminating in his new book which was coincidentally published this year. It delves into the topic by exploring the Western origins of the modern university and how Chinese academic traditions have differed.

"The Chinese tradition does not place the state in opposition to academia. There is no tension there, it is like family. The emphasis is on how much you understand and contribute. We have a famous saying in Chinese that we worry about everybody first before ourselves and let everybody enjoy themselves before ourselves. The emphasis is different from Western academia. This Confucian cultivation of character is one of the fundamental features of the Chinese system," he said.

In practice, both systems can be problematic, he said. But scholars who work within a

I strongly believe in intellectual pluralism and mutual respect. If you want to be sustainable, you have to understand and live with others.

> with traditional values must also deal with contradiction

This brings him back to the point that Hong Kong's education system seems to have done well navigating the two. He has started meeting with local principals to generate discussion about the qualities that mark out the best schools and to start learning from them. He believes a solid grounding in traditional Chinese wisdom and classical language could be a good resource for integrating the best of both worlds.

Hong Kong well-placed

Professor Yang also believes HKU's Faculty of Education is one of the best places to get this discussion rolling, and not just because of its geographical and cultural position at the crossroads of East and West. The quality of work by its academic staff is very strong.

"This Faculty has been consistently ranked among the top 10 in the world for years. I'm even more proud that we are always the best-ranked Faculty of Education among non-Western societies. We have achieved a lot learning from the West. Now, we can do more to serve the local community," he said.

This means furthering contributions to local policymaking, school management, academic performance and classroom application, as well as to global theory about education. "Hong Kong is well-placed to

PROFESSOR RUI YANG

Western system but live in a Chinese society

make breakthroughs in terms of educational experiments. And we can contribute to local engagement, Chinese societies and globally.

"We do face serious challenges, such as a shrinking population locally and growing nationalism and anti-globalisation internationally. But we can find opportunities in this. I strongly believe in intellectual pluralism and mutual respect. If you want to be sustainable, you have to understand and live with others. I think HKU's Faculty of Education can contribute to this," he said.



The Chinese Idea of a University: Phoenix Reborn was published in September 2022 by Hong Kong University Press.

OUR NEW HEAD OF **HKU-SHENZHEN HOSPITAL**

When Professor Lo Chung-mau stepped down as Chief Executive of the HKU-Shenzhen (HKUSZ) Hospital on July 1 to become Hong Kong's new Secretary of Health, the University did not need to look far for a worthy replacement: Professor Kenneth Cheung Man-chee, former Head of Orthopaedics, has been involved in the hospital from its early days.

rofessor Kenneth Cheung Man-chee, Chair Professor of Orthopaedics and Traumatology and Jessie Ho Professor in Spine Surgery, and now Chief Executive of the HKUSZ Hospital, has made a career of traversing East and West and seizing opportunities with the energy and drive that befit someone who has been a long-distance runner for many years.

He was schooled in the United Kingdom from age 11 and trained there before joining HKU in 1992, where he completed an MD and become a world-respected spinal surgeon. He became the first non-North American president of the Scoliosis Research Society and founding chair of AO Spine's Research Commission, devised new treatments including the first magnetically controlled growing rod to correct spinal deformities, and undertook major funded projects on the genetics of disc degeneration with the School of Biomedical Sciences.

He also headed the Department of Orthopaedics and Traumatology from 2012 to 2021 where he raised its public profile and fundraising prowess and established the spine surgery speciality at the HKUSZ Hospital after it opened in 2012.

While others might be happy after all that to take it easy, Professor Cheung is now seizing a major new challenge heading HKUSZ Hospital.

"I was motivated by two thoughts. One was that I feel an attachment towards the hospital because I have been there from the beginning. Seeing how the hospital has built up over the years is like watching a baby grow up. You don't abandon your child.

"The other thought was that HKUSZ Hospital is a reform hospital and there are a lot of

opportunities to really trailblaze and innovate, and lead healthcare reforms in China."

Recognition from the top

Since taking up his position on July 1, he has been overseeing expansion plans and working towards targets that reflect the central government's faith in the hospital.

HKUSZ Hospital is the only hospital operated solely by HKU. Under Professor Lo and his predecessor, Professor Grace Tang Wai-king, it was accredited by the Australian Council on Healthcare Standards in 2014, collaborated with Hong Kong's Hospital Authority from 2015 to provide medical care for Hong Kong citizens in China (the only such hospital to do so), and was awarded Triple A accreditation in China, the highest standard awarded in the country in 2017.



Professor Kenneth Cheung Man-chee (left) at the HKUSZ Hospital Chief Executive Inauguration Ceremony.



The HKU-Shenzhen Hospital is in the midst of an expansion with a research block and new 1,000-bed clinical block under construction.

Last year, the central government named it one of 14 high-quality experimental hospitals nation-wide to lead the country in developing innovative new treatments, providing 'green' healthcare that makes appropriate use of resources, and treating the most serious illnesses.

"The other 13 hospitals are all brand names in China with histories of 100 years or more. We are by far the youngest of these hospitals, which I think is recognition of what we have done as a hospital and of HKU's brand within the Mainland," Professor Cheung said.

These achievements are also starting to be seen as a model of Hong Kong-Shenzhen cooperation at a time of greater integration across the Greater Bay Area (GBA). "Our hospital has had regular visits from other government officials and organisations to try to understand how the two places can work together," he said.

Expansion underway

Professor Cheung's own vision for the hospital includes keeping the focus on patient-centred care, recruiting talent within and outside China, and continuing to promote the highest possible standards of care.

"I have had a lot of experience in international and interdisciplinary collaboration across all corners of the world and I want people within HKUSZ Hospital to have an open mind and look internationally for the best practices we can adopt," he said.

"I also want them to embrace innovation not only in treatment but research. Shenzhen has a strong industrial backbone, while HKU has lots of ideas without an industry base. I hope both doctors and researchers will think about how HKUSZ Hospital can facilitate biomedical and translational research."

The hospital is in the midst of an expansion. A research block and new 1.000-bed clinical block are under construction and will be completed by 2025 and other spaces have been offered for research and clinical services. The central government also hopes Professor Cheung can help promote international recognition of the Triple A standard.

"It's exciting to be here because all these different things are coming together. I think if Hong Kong is to succeed, we have to be part of the GBA. One of my missions is to convey the excitement of working here to my colleagues and particularly the younger generation. There are many possibilities for future growth," he said.

PROFESSOR KENNETH CHEUNG MAN-CHEE

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THE IMPOSSIBLE BOOK

Music Professor Daniel KL Chua and his co-author Alexander Rehding describe their new publication purporting an intergalactic music theory of everything as an "impossible ok". It's certainly out there, combining laughs with deeply consequential ideas about the fundamental nature of music, such as – can we communicate with aliens through music?



NASA's spaceships launched into space in 1977, carrying on board the 'Golden Record' – an LP made of gold-plated copper containing 90 minutes of music from around the world. Professor Chua has been pondering why the NASA team would choose to send music into space and what would happen to the music in the unlikely event of aliens encountering the record. (Courtesy of NASA)

n 1977, NASA launched its two Voyager spaceships to travel to the distant reaches of the galaxy. Attached to each vessel was the 'Golden Record', an LP made of gold-plated copper containing 90 minutes of music from around the world, as well as a montage of other sounds on Earth, 115 photographs and greetings in 55 languages, all meant to convey the message: we come in peace.

The Golden Record has excited space fans for years, including Professor Daniel KL Chua,

Mr and Mrs Hung Hing-Ying Professor in the Arts and Chair Professor of Music, who has been pondering why the NASA team, led by famed astronomer Carl Sagan, would choose to send music into space and what would happen to the music in the unlikely event of aliens encountering the record.

His response, formulated with Professor Alexander Rehding of Harvard University, is laid out in a new book, Alien Listening: Voyager's Golden Record and Music from *Earth*, which puts forth what he humorously calls an "intergalactic music theory of everything" that could have universal application beyond Earth.

"Because we humans have rocketed music in space, we need to think about how music in a context without any human culture communicates. In this book, we are re-thinking what music is and what's possible for music beyond human ears," he said.

"Our argument, in simple terms, is that music is repetition. As such, it helps us mark



If you only think of music as human expression, you forget it belongs to the universe. The ancients knew this. We need to recover their understanding of music but in a modern way.

and shape our experience of space-time. Repetition is all you need to create a coherent fabric of time. Music both makes time and is something that is time, and so discloses to us something beautiful about the universe we inhabit."

No ears needed

Seeing music as repetition – be it steady hammer blows on steel, whale songs or a Beethoven symphony – makes it possible to conceive that an alien could receive these patterns and through that, realise humans have an understanding of the universe, he said. Language cannot do this because its signs are arbitrary.

But of course, this assumes aliens have ears. "Aliens may not be able to even hear, but they could sense repetition in some form, such as vibration," he said.

This leads to the other aspect of their theory, which they call "media archaeology" – the technological side of music. "Music cannot be thought of without technology. Music is not pure; there is always a medium between us. Even our ears are media," Professor Chua said. The medium always makes a big difference in how music is experienced. For instance, elephants and fruit flies would hear a threeminute Mozart aria very differently (assuming they could tune into the correct frequency).

To help the aliens tune in, NASA imprinted illustrated instructions on the record sleeve on how to make a gramophone and play the Golden Record. However, as Professor Chua points out, this assumes aliens have hands.

But there is a bigger question in the book about what role media plays in music. "We will never be able to communicate music as we hear it to other species, and this gap – this interface – is the most precarious and also the most interesting point of communication. Thankfully, we don't need to have perfect communication to get a message across the unknown. You can actually share something of your experience of time with someone else through music. Music enables an 'Other'



Alien Listening: Voyager's Golden Record and **Music from Earth**

PROFESSOR DANIEL KL CHUA

Authors: Daniel KL Chua and Alexander Rehding Publisher: ZoneBooks (Princeton University Press) Year of Publication: 2021

to keep time with us, as it were, however imperfect the medium," he said.

"Carl Sagan saw the Golden Record as an ultimate act of cultural diplomacy from our planet. By sending music, you're communicating that we come in peace, which is a huge presumption that the universe is peaceful."

Back to the cosmos

The book explores these concepts in a playful way, treating music as an object rather than an expressive subject. There are puzzles, cartoons, pages with just a dot to convey an idea of space, and much more.

The authors also reference ancient theories of music, such as those of Pythagoras and Confucius, who believed music to be related to the cosmos.

"If you only think of music as human expression, you forget it belongs to the universe. The ancients knew this. We need to recover their understanding of music but in a modern way," Professor Chua said.

Time is of the essence - and not only because Voyager is reaching the limit of being able to emit signals back to Earth. "Why have we written this now? It's the most important topic for music because our planet is in crisis on a massive scale – we are having to think about the challenges of climate change and much larger questions of time. And this requires a bigger view of music," he said.

HONG KONG DIRECTORS **SHAPING MAINLAND MOVIES**

A new book looks at the role of Hong Kong filmmakers in directing Chinese 'main melody' films – commonly viewed as propaganda vehicles – in their cross-border ventures, and the implications of this for both Chinese and Hong Kong cinema.

rofessor Stephen Yiu-Wai Chu's book Main Melody Films: Hong Kong Directors in Mainland China, was partly prompted by the words of President Xi Jinping at the 19th National Congress of the Chinese Communist Party (CCP) in 2017 when he said: "Our compatriots in Hong Kong and Macao will share both the historic responsibility of national rejuvenation and the pride of a strong and prosperous China."

According to Professor Chu, those words have had a strong impact across China, including in the entertainment industry whose Zhang Hongsen, Former Deputy Director General of the Film Bureau of the State Administration of Radio, Film and Television, stated: "The film industry will follow the guiding principles of the 19th CCP National Congress."

"I am interested in the changing situation Hong Kong culture has to face in this context," said Professor Chu, who is Director of HKU's Hong Kong Studies programme. "It's pertinent to explore the relationship between Hong Kong's cultural industries and their Mainland equivalents, thereby disclosing the ways their political economies interact. Hong Kong filmmakers' increasing participation in main melody films provides a good case study for this purpose, because it involves intricate cross-border dynamics that connect cultures to politics."

Main melody films were originally derived from the musical term leitmotif, referring to state-sponsored, keynote films with central themes. "Best known as 'propaganda films' in the West, they had their roots in propaganda works that promoted certain ideas for and/ or paid tribute to the nation," said Professor Chu. "During the early Mao years, the Fourth Generation of Chinese filmmakers focussed on Soviet-inspired propagandist films, given the government's stranglehold on mass media. From 1949 to 1976, films were used to serve politics. Owing to the open-door policy engineered by the then paramount leader Deng Xiaoping, the cultural industries in Mainland China underwent significant changes in a decade of reforms when the capitalist energy of China was gradually released in the 1980s"



'Quasi-main melody blockbuster'

At the start of the millennium, the movies got bigger. The book discusses Zhang Yimou's Hero (2002) which was described by Professor

PROFESSOR STEPHEN YIU-WAI CHU

I am interested in the changing situation Hong Kong culture has to face... It's pertinent to explore the relationship between Hong Kong's cultural industries and their Mainland equivalents, thereby disclosing the ways their political economies interact.

Darrell Davis of Lingnan University as "no less main melody than any main melody picture". "The film was viewed as a 'guasi-main melody martial arts blockbuster' and 'China's first local blockbuster fully modelled on the contemporary Hollywood blockbuster," said Professor Chu, "and while Hero stirred up controversies about its pro-establishment ideology, it also successfully set an example for the blockbusterisation of the Chinese film industry."

After 2009, Chinese cinema entered a new stage of development, and The Founding of a Republic is seen to have set the stage for main melody blockbusters, although its commercialisation was still lacking. Against this background, said Professor Chu, Hong Kong directors had the chance to helm main melody blockbusters with an eye to enhancing their commercial competitiveness.

"At its peak, Hong Kong cinema was first in the world in terms of per capita production, as well as the second largest exporter of films after the United States," he said. "More importantly, Hong Kong filmmakers from this small city once dubbed 'Hollywood of the East' developed their careers with the Hollywood operation logic. They took active parts at every important juncture of the commercialisation of main melody films.

"For example, Teddy Chan's privatelyrun Bodyguards and Assassins (2009) as a paradigm shift of main melody blockbuster; the successful blockbusterisation of typical main melody by Tsui Hark's The Taking of Tiger Mountain 3D (2014); the diversification of main melody film genres by, among others, The Captain (Andrew Lau's disaster film, 2019) and Leap (Peter Chan's sports film, 2020). In short, Hong Kong directors' experience in making commercial films brought various genres such as police and gangster, action, wuxia and disaster films, revitalising the otherwise stereotypic, clichéd main melody genre."

Professor Chu also cites Miao Xiaotian, General Manager of the China Film Co-Production Corp, for recognising the significant role Hong Kong film talents have played in boosting the industry in Mainland China when he said: "In the past we focussed mainly on art films. Through our collaboration with Hong Kong we understood the concept of commercial films, beginning to know how to attract the audience to our films."

Professor Chu describes his book as "a distinctive attempt to turn away from the Mainland-Hong Kong dichotomy, shifting the emphasis to cultural translations across the border. Focussing on Hong Kong filmmakers' contributions to main melody



blockbusters that affected both regions, it will generate a renewed interest in the entanglements Hong Kong pop cultural genres face when they respond to the changes caused by the integration of Hong Kong culture into Mainland China."



Main Melody Films: Hong Kong **Directors in Mainland China**

Author: Yiu-Wai Chu Publisher: Edinburgh University Press Year of Publication: 2022

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