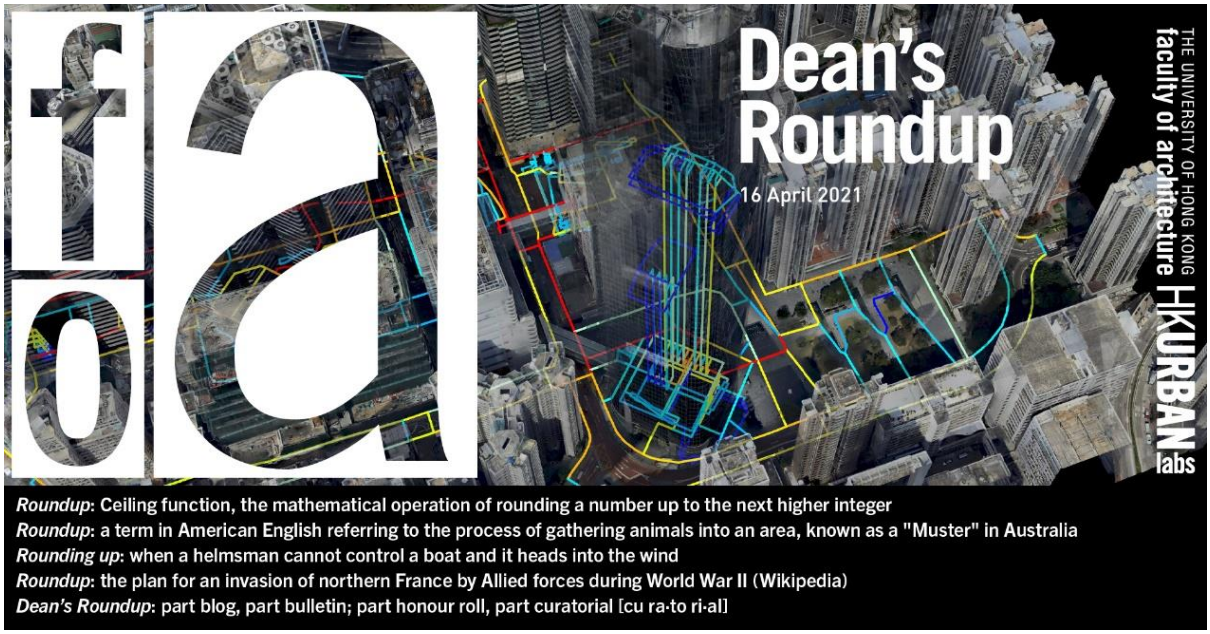


A faculty that models friendship

I recently wrote the piece below in response to an invitation from HKU's Architectural Society (AS). It is tradition in HKU for its student societies to adopt a name and a mission for the year and to make something of this when the new executive committee is inaugurated. I share the piece with teaching colleagues and FoA friends to show that FoA's goals extend beyond academic excellence. A university and its faculties and departments are communities that shape lives. It is good when the conversations we have with our students embrace the full scope of our university motto, which reads, in Chinese, *mingde 明德 (to manifest virtue)* and *gewu 格物 (to investigate things*); and in Latin, *virtue* and *wisdom*. Friendship can be both inward-looking and outward-looking, depending on your boundaries, purpose and attitude to others. Self-interested friendship is an evolutionary strategy within groups (strength of the clan), and between groups (clan alliances). But one of the great achievements of modern human civilisation is to have created sufficiently secure environments for individuals to build open and non-defensive friendships around multiple interests beyond family and clan. We are currently in a global social moment when defensive cultural boundaries are re-emerging. Shared educational experience has proven to be a powerful equalising, unifying, social class eroding and bridge-building device in modern history. Our AS student leaders want to spend their year in office building friendship and trust across the FoA student body. According to the QS organisation, which measures university KPIs globally, HKU is one of the most international in the world. That means we have huge potential for gains when turning our energies to building a culture of friendship. I hope we can all work actively and inspirationally with AS in support of this great vision.

Personal message from Professor Webster to Arkadaş, the 2021/22 executive leadership of HKU's student Architectural Society

I was so glad to read the vision statement of this year's AS executive. Arkadaş has set itself a noble task pursuing a much needed vision. Well done all. Let's hope that after a year pursuing your vision of greater inclusivity, integration and friendship, Arkadaş will go down in FoA's history as having opened up AS to the truly multicultural family that HK now is. Leadership is the best way to model vision. Leaders (political, company, student society, religious, etc.) who have personal integrity, inspire personal integrity among those they serve. If Arkadaş' leadership truly believes in the 'FoA friendship' vision, which I am sure it does, then this will be a very exciting year. I am happy to work with you on appropriate collaborations between FoA teachers and AS, directed at your mission.

Arkadaş is a great name (note the grammatical squiggle under the 's' of the Turkish word means that this is pronounced 'Arkadash'). I have close links with Turkey and while their president is known as one of the world's contemporary strong-man populists and overly-powerful politicians, the country is often wrongly viewed as somehow all being tainted by the weaknesses of its governance system. Nothing could be farther from the truth. Countries by and large do not choose their leadership systems and in many ways, even in the so-called free liberal democracies, do not really choose their leaders. Some democratic systems are better than others. American democracy is widely regarded as being at something of a crisis point. Turkey comprises a liberal west coast and traditional central and eastern regions. It's a wonder to many observers that friendship binds this ancient cultural geo-political entity together. But it does, supported by appropriate laws and practices.

Personal friendships are easy, unless they go wrong in which case they are among the most difficult and traumatic. Family friendships can be more tricky, because you don't get to choose your family! Friendships across cultural, ethnic, national, regional, religious and political groups can be easy and wonderful at an individual level. But for leaders and influencers trying to break down long-developed divides, where legacy culture and status-quo norms shout otherwise, they are embarked upon both a truly noble ambition and a very difficult task. But it can be done. It can be done in different ways. Mahatma Gandhi, Nelson Mandela and MLK Junior were astoundingly successful by blending a mix of self-sacrifice, forgiveness, tolerance and the rule of love, with popular peaceful protest and patient dialogue. The Bretton Woods agreement that formed the World Bank and UN after WW2, and the EEC and EU that followed, were all attempts to avoid continuing and repeated conflict and achieve friendship via political and economic means. The ultimate end of the EU project is to achieve cultural homogeneity as a basis for friendship between countries that have been at war on and off for centuries. Ironically, the demand for politically-generated cultural, legal and fiscal union, has brought the ultra nationalists to their most powerful

position in Europe since the fateful 1930s. By contrast, Brexit Britain, with a popular suspicion of this 'grand Europe' approach to friendship by coercive rule of law, has been more easily able to negotiate on delicate internal politics. The result has been that the far right party in Britain was more or less laughed, maneuvered and voted out of existence in recent voting and is not the threat that the far right is in France, Italy, Greece, Hungary, Austria, Poland and elsewhere. Some methods of forging friendships between groups are more risky and less likely to succeed than others.

Sometimes small gestures can make big gains. Small seeds can grow into mighty trees. There is another organisation called Arkadiş. It aims to shine a light for friendship between Turkey and Israel. Jews have lived in Turkey for three millenia, and established strong communities there after bloody persecution and forcible eviction from France, Spain and other European countries in the late middle ages, and before that, from waves of persecution by occupiers of Palestine from Ancient Rome to the European Crusaders. In a small Israeli town, there is a statue of Ataturk, the founder of the modern Turkish nation. It's a small gesture but an influential one. It shows that someone really does care about friendship between these two peoples while most eyes are on the growing political animosity expressed by national leaders.

So – very best wishes to FoA's Arkadaş. I expect to see many small statues to friendship popping up around the faculty and many more seeds that cannot be seen right now but that will, over the next few years, grow into large trees under which FoA students from multiple backgrounds can find shelter and shade. Let me know what you think we can do together.

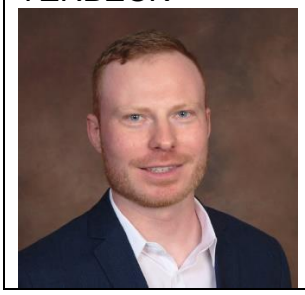
As always in Dean's Roundup: congratulations to colleagues whose work is mentioned below. FoA's teachers and researchers inspire in many ways. I plan to ask colleagues currently active in innovation and entrepreneurship to say something about their patents, spin-offs and other activities in the coming few DRups. In this issue, you'll learn about Llewellyn Tang's recent success at the Geneva Inventions exhibition, and about Jun Ma's patents.

Chris Webster

Dean, FoA.

Faculty of Architecture

1. Welcome to the following academics and researchers, who have recently joined our Faculty or are now serving in a new role:

Dr Bin CHEN 	Assistant Professor, joined the Division of Landscape Architecture w.e.f. 31 March 2021.
Ulrich Nikolaus KIRCHHOFF 	Serves in his new capacity as Associate Professor of Practice in the Department of Architecture w.e.f. 1 March 2021.
Dr Ka Man LEUNG 	Post-doctoral Fellow, joined the Department of Real Estates and Construction w.e.f. 17 March 2021.
Dr Fabian Josef TERBECK 	Post-doctoral Fellow, joined the Department of Urban Planning and Design w.e.f. 8 March 2021.

Dr Yulun ZHOU 	Assistant Professor, joined the Department of Urban Planning and Design w.e.f. 7 April 2021.

2. As of 13 April 2021, the following PhD candidates have been awarded the Research Grant Council's Hong Kong PhD Fellowships (HKPFS) and/or the HKU Presidential PhD Scholarship (HKU-PS) in the 2021/22 admission exercise:

HKPFS and HKU-PS Awardees

Name	Dept.	Primary Supervisor	Co-supervisor
Mr Dong Li	DUPAD	Professor Anthony Yeh	Dr Weifeng Li
Mr Dongsheng He	DUPAD	Dr Guibo Sun	Professor Chris Webster
Mr Mutu Tantrige Osada Vishvajith Peiris	DUPAD	Professor Anthony Yeh	Dr Jianxiang Huang
Mr Mingze Bai	DUPAD	Professor Shenjing He	Professor Kelvin Wong
Ms Yuquan Zhou	DUPAD	Dr Weifeng Li	Dr Jiangping Zhou

HKU-PS Awardees

Name	Dept.	Primary Supervisor	Co-supervisor
Mr Benjamin Kwaku Ababio	REC	Professor Wilson Lu	Dr Frank Xue
Ms Xinhui Chen	DLA	Dr Cecilia Chu	To be confirmed

Department of Architecture

1. Dr. Kristof Crolla

   - has been awarded the University Research Committee Small Equipment Grant 2020/21 for his project entitled ‘Equipment to support applied Augmented/Virtual/Mixed Reality intergration into current digital design and fabrication workflows’, at the amount of HK$559,579.83, for a project period of 36 months commencing 1 April 2021.

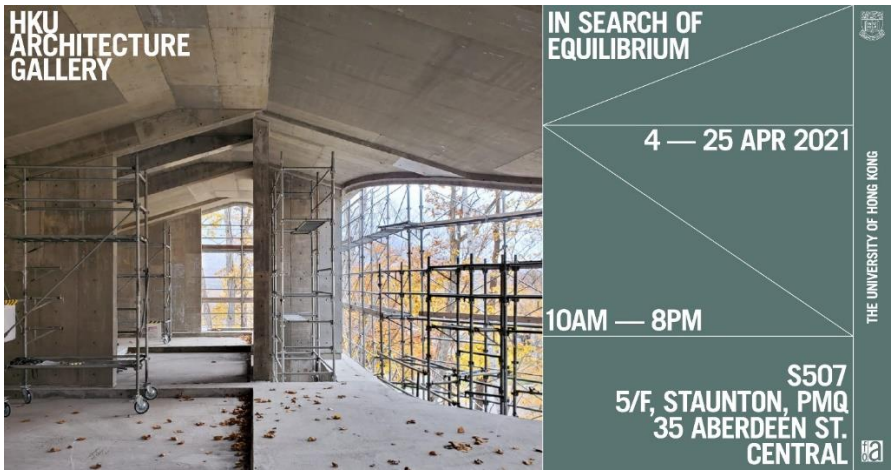
2. Dr. Eric Schuldenfrei

   - has been awarded the University Research Committee Small Equipment Grant 2020/21 for his project entitled ‘Equipment for the Fabricaiton Laboratories to support an appied and sustainable digital fabrication workflow’, at the amount of HK$895,800, for a project period of 36 months commencing 1 April 2021.

3. William Tam and Stephen Chan

   - are exhibiting their design projects at PMQ, to investigate built forms and search for the equilibrium confluence of conception with technique.

   In Search of Equilibrium



   The three projects on display are a series of wider practice and research work, designed by William Tam, Associate Professor of Practice at the Department of Architecture, HKU, and our alumnus Stephen Chan (MArch 2000), who also received the HKIA Young Architect Award in 2004. Two of the projects were completed, namely *Library Club* (2016) in Shunde (順德) and *Snow Lodge* (2018) in Niseko, Hokkaido (北海道二世古). *Infinity Library* (2019) in Dayi, Chengdu (成都大邑) is still at its detail design stage.

   The projects investigate built forms and their resolution with narrative, context, function, space and tectonic, encouraging encounters, engaging movement and making everyday life attractive. Behind these projects is a search for the equilibrium confluence of conception with technique.

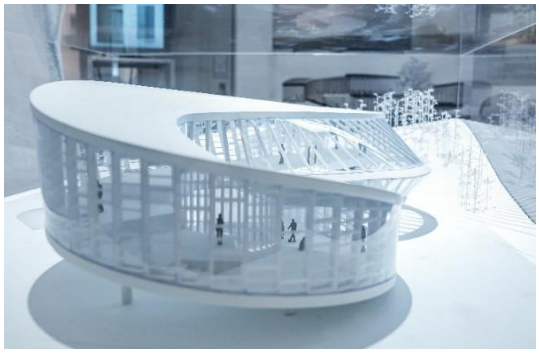
For further enquiries, please contact Ms Isabel Wong at isabel.wong@hku.hk.

Date:	**4 April (Sunday) – 25 April (Sunday) 2021**
Time:	**10:00am – 8:00pm**
Venue:	**S507, 5/F, Staunton (Block A), PMQ, 35 Aberdeen Street, Central, Hong Kong**

Library Club (2016) in Shunde is inspired by duckweed in Lingnan (嶺南) countryside; the building sinks whereas lawns extend to the interlacing, round-cornered roofs. The organic flow of the canopies, landscape, light and shadow build a three-dimensional garden, where local clay bricks are made convex/concave and spaced to create ever-changing transparency.

Snow Lodge (2018) in Niseko, Hokkaido is next to a ski resort where summer pastures are covered by winter snow. The streamlined architectural language inspired by skiing echoes the internal spatial sequence whilst its glass walls reveal and reflect movement. Along with its natural building materiality, the southeast-facing balcony opens to Mount Yotei, strengthening the relationship between man and nature.

Infinity Library (2019) in Dayi, Chengdu uses the infinity symbol to form a Mobius Strip, signifying the boundary-free course of pursuing knowledge. The bookshelves are part of the structure, so that taking a book out is to glimpse the natural world beyond. The stepped circulation follows the hilly landscape; its floor warps into a bridge with views to paddy fields. Within the loops are two courtyards mimicking terraces and reflecting the sky through its pond.



Video interview: https://www.arch.hku.hk/event_/in-search-of-equilibrium/

Department of Real Estate and Construction

1. Ir Dr Llewellyn Tang

- BIM Warehouse of Llewellyn and Partners Company Limited (LPC) won Silver Medal at the 2021 Special Edition of The International Exhibition of Inventions of Geneva (IEIG). It is invented by Ir Dr Llewellyn Tang and the LPC team.

  Mr Alfred Sit, the Secretary for Innovation and Technology of the Hong Kong SAR Government, sent a congratulatory letter on 31 March 2021.

  BIM Warehouse formulates a new AEC business model. It is a B2B2C e-warehouse and e-commerce platform to house AEC assets within an ISO-compliant asset information management platform (AutoCDE) that integrates BIM, GIS, IoT, A.I. and Blockchain. Its A.I. functionality (AutoBIM) can generate a semantic 3D BIM model. Powered by its blockchain (AEC2hain), it is a solution to AEC and real estate tokenisation. BIM Warehouse optimises the processes and unifies the industry's supply chain for higher cost efficiency and security. It empowers the sector for a new construction normal in digitalisation, standardisation, integration and industrialisation.

  This year's competition is a first-ever special virtual-only edition of IEIG, one of the most significant global annual events devoted exclusively to inventions. Around 600 inventions from about 20 countries were evaluated on virtual platforms by an international jury of specialists from 10 to 14 March 2021.

- gave a webinar at Technology Transfer Office's HKU Technology Transfer Primer on 17 December 2020, as one of the Technology Startup Support Scheme for Universities (TSSSU@HKU) awardees 2020. In the webinar, Ir Dr Tang talked about his start-up company (LPC) and the latest technology, recent milestones and entrepreneurial journey with the support of HKU TTO: https://www.tto.hku.hk/event/technology-transfer-primer-highlight-on-tsssu-hku-awardees

- was featured in HKU Technology Transfer Office's (TTO) e-Newsletter *TechXfer* Issue 9 (published on 22 March 2021), on his successful story of the perfect concoction of BIM, A.I. and Blockchain Technology: https://www.tto.hku.hk/news/tto-e-newsletter-techxfer-issue-9-2021

- was interviewed by HKET on 9 April 2021:

【建築數碼化】HKU 建築學博士結合國際經驗 建公司提高本地建築 BIM 標準: https://inews.hket.com/article/2926686/【建築數碼化】HKU 建築學博士結合國際經驗%E3%80%80 建公司提高本地建築 BIM 標準

【建築數碼化】建築 BIM 系統結合人工智能技術　提升建築成本效益:
https://inews.hket.com/article/2926709/【建築數碼化】建築 BIM 系統結合人工智能技術%E3%80%80 提升建築成本效益

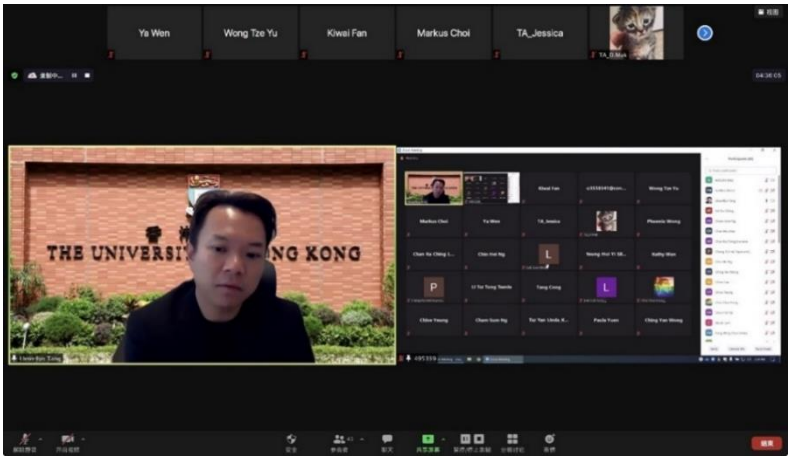
Featured news and stories of his start-up company (LPC) at HKU TTO:
https://www.tto.hku.hk/news/bim

- was featured in an article on Ming Pao, 17 September 2020, where he shared his views on knowledge exchange, BIM innovation and entrepreneurship:

https://news.mingpao.com/pns/港聞/article/20200917/s00002/1600279985168/港大教授開發工程數據平台-冀助建造業轉型

- gave an online workshop on BIM, Common Data Environment (CDE) and ISO 19650, on 8 and 15 January 2021, to all Year 3 and Year 4 Surveying students. The workshop was to keep students up-to-date with the latest international and local practice on the use of BIM and other latest digital technologies, for through-life project and asset management.

  Upon finishing the workshop, each participating student received a CPD Certificate issued by the Department, which served as one-day education requirement of the CIC-Certified BIM Manager Scheme.



- was honoured as ‘BIMer 2020’ by the Construction Industry Council (CIC) at the Celebration of BIM Achievement 2020, held virtually on 10 November 2020, for his transformative achievements in unleashing the potentials of BIM in his over a decade of R&D and teaching experience in the UK and China.

In the ceremony, Ir Dr Tang talked about his early dedication to the research of artificial intelligence and digitalisation in the UK, which had rooted his ambition in shaping the new era of a smart city, launched his journey in introducing the UK BIM Level 2 into China, where he led the formulation of the strategic framework of smart infrastructure based on BIM, GIS, IoT and Blockchain technologies. As a founder of Llewellyn and Partners Company Limited (LPC), with the support of HKU, he continues his passion in his hometown, Hong Kong, to empower individuals, brands, and the community with cutting-edge digital solutions, training and cross-border synergies.

https://www.linkedin.com/posts/construction-industry-council_outstanding-bimers-winners-showcase-activity-6757442873983016960-EH7w

- gave a talk for the Faculty of Architecture on 4 December 2019, titled ‘ISO 19650 – An International BIM Language Shaping Surveyors’ Role for Industry Integration, Workflow Digitalization, and Innovation’.

- published an article to share his experience on bringing the first ISO 19650 standards on BIM and innovative information management into China:

  Tang, L.C.M. (2019) On Wanda's digital road – strive for a single-minded pursuit, endeavor to be sensible, *30th Anniversary Year Book for Wanda Commercial Planning*.

_万达广场的数字中心
_WANDA PLAZA IS THE CITY CENTER

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2018年，万达成为中国第一家基于BIM Level 2标准（PAS1192-2和PAS1192-3）的BIM双英标认证（Kitemark）双认证的企业；并且通过实施BIM Level 2带中国的首次验证与标准对标，万达实现了从集团内部部门到供应链由内而外的项目整体信息系统质量管理水平的提升，该标准很快将在2019年初成为国际标准组织ISO 19650全球BIM标准。获得BSI Kitemark的价值不仅限于使万达集团自身成为国际高数字化水平企业之一，也令万达集团能够好的将最新、最好的建筑行业的数字化理论及实践推广到行业当中。

万达集团计划在未来10年建造大量的万达商业综合体，作为万达集团乃至中国所有建筑相关企业数字化的领军者，为未来中国建筑相关企业的标准化、数字化置下以下蓝图。

公司管理数字化：企业全面信息化，各业务部门已全面采用信息化系统进行日常业务管理，以信息化手段去实现战略信息—组织信息—项目信息一体化传递的目标，为中国建筑相关企业对于管理数字化提供了重要经验。

项目组织数字化：万达针对建造项目开发的"万达筑云"在线智能项目管理平台，进一步的实现了建筑物相关的二维图、三维模型、传感器数据和监控视频信息集成一体式数据整合，利用智能机器学习、大数据分析等手段以"技术+数据"的形式实现项目优化，并由此逐步进行下一阶段的智能规划、深层次数据挖掘、商业发展预测模型开发提供了坚实的基础。

项目战略数字化：万达集团在数字化道路上不断的探索中发现，数据和信息的重要性不仅限于它们本身，还体现于它们的质量和所能带来的价值。万达信息化项目管理平台汇聚了万达集团多年来对有效的建筑设施和资产管理的经验，将自己更多的放在了"WBIM"的深层次理解和设施管理（facility management），在建筑项目中为完成和建建筑生命周期信息化管理提供强有力的支持。

三、得其大者可以兼其小

研究数据显示，预计到2030年，全球建筑市场将相较于2018年将净增8万亿美元，其中中国建筑业产值将增长2.1万亿美元，我国建筑行业面临着巨大的机遇和大变革时代，万达集团有责任也有义务带领中国房地产行业走出数字化迷雾，尽享数字化时代的科技红利。

通过不断学习和实践，万达集团已将项目设计、施工、运营管理统一结合，利用"万达筑云"平台将各阶段业务共享并参数加入了运营阶段，万达集团的先进管理体系及其研发的信息化系统正在为中国建筑相关企业的发展做出先行努力，大大促进了行业的发展，这是万达集团成为全国最大的商业地产公司的价值所在之一，也是万达集团作为行业的领头者的职责所在。

作为建筑数字化建造和管理应用的先驱者，万达集团在发展建筑相关行业数字化的同时，也计划将设施管理领域的新概念通过"万达慧云"集成更多的万达综合体，进而实现商业管理的数字化，并最终实现商业建筑从规划设计、施工运营，到后期商业运营全产业链的数字化管理，这对中国建筑行业的数字化的发展同样意义重大。

万达30年，是中国建筑行业数字化水平追赶世界先进水平的30年，希望万达能够在这场追赶中，做好领头羊，带领中国企业突出重围。

III. AN ENTERPRISE WHICH ADDRESSED CORE ISSUES WON'T SHUN FROM SECONDARY RESPONSIBILITIES

According to research data, it is estimated that by 2030, the global construction market will increase by 8 trillion US dollars compared with 2018, and the output of China's construction industry will increase by 2.1 trillion US dollars. In a time when China's construction industry is facing tremendous opportunities and great changes, Wanda Group has to take the responsibility to lead the Chinese real estate industry run out of the digital fog and enjoy the technological dividend in the digital age.

Through continuous exploration and practice, Wanda Group has unified the project design, construction, and management process by utilizing the Wanda Zhu Cloud to share the progress in each stage of the project development. Wanda Group's advanced management system and its research and development information system are making pioneering efforts for the development of the entire construction-related industry in China. This is not only one of the values of Wanda Group for being the largest real estate company in the country, but also a responsibility Wanda Group should take as the industry leader.

As a trailblazer in the field of digital construction and management of buildings, Wanda Group plans to integrate the new concept of facility management into more Wanda complexes through the "Wanda Hui Cloud", so as to realize both commercial management and the digital management of the entire business chain, from planning, design, construction, to the operation of commercial property. It is an endeavor equally significant for the digital development of the Chinese construction industry as a whole.

In the past 30 years, China's construction industry has been striving to catch up with the world's advanced level in terms of digitization. It is hoped that Wanda can take the lead in this pursuit and marshal Chinese enterprises to stand out in the global market.

_COMMERCE CHANGES LIFE
WANDA COMMERCIAL PLANNING • 1988–2018

ON WANDA'S DIGITAL ROAD —— STRIVE FOR A SINGLE-MINDED PURSUIT, ENDEAVOR TO BE SENSIBLE

论万达的数字化道路

——万行缘由一心，忧劳徼为洞达

郑进明
香港大学建筑学院房地产及建设系 BIM 教授

科技是推动历史车轮滚滚向前的不竭动力。造纸术传入欧洲，掀起了一场文艺复兴，结束欧洲大陆的黑暗时代；瓦特改良蒸汽机，人类进入工业文明时代；计算机诞生，则将人类带入日新月异的信息时代。

科技带来的巨变不仅改变着人们对世界的认知，也改变着人们"衣、食、行"等方方面面，但它对人类"住"的改变却微乎其微。建筑似乎是被科技力量遗弃在时光角落里的"古董"。随着农业社会的"手工化"结束和工业社会的"机械化"场景逐渐退出舞台，"智能化"将成为社会的主导力，这将迫使建筑行业的信息化和数字化时代。

一、起于三寸之坎，以就万仞之深

过去几十年，建筑市场在全球范围内都对GDP的增长有着不容忽视的贡献，但包括麦肯锡在内的诸多研究机构却发现，过去30年，工程建造行业和资产管理行业在数字化大爆炸时代，对数字化应用水平之低到了令人难以置信的地步，这两个行业中的企业几乎占据了全球（包括中国在内）建筑相关行业的核心地位，但令人遗憾的是，他们似乎并没有意识到数字化所能带来的好处和推行数字化的社会紧迫性。

有部分研究者认为，并不能将责任归咎于建筑行业，项目工期延迟和生产率低下是建筑相关企业财务回报率相对较低的罪魁祸首，在财务回报率无法明显上升的情况下，让建筑企业投入更多数字化创新，如为其难。他们恰恰忽略了一个问题，工程建造项目中项目延迟和生产率低下的根本原因，在于建筑相关行业的数字化水平低下和创新技术不足。

每一个行业都不缺乏先行者，事实上，建筑信息模型（BIM）作为建筑行业最新一代技术，已经被越来越多的先行者认为是建筑行业数字化能力的体现。在欧洲乃至全球，BIM在数十年前已经成为一些建筑企业或团队的必修课。我国BIM技术的发展虽然还未达到欧美发达国家的水平，但是也有一些行业先行者在积极推动这项技术的进步。2011年，住房和城乡建设部将BIM正式纳入"十二五"规划，将它视为新型、设计、建筑业的核心技术之一。

在建筑领域，中国拥有7000多家相关的企业，万达集团是其中一家，同时也是拉起企业中为数不多的先行者，在更多房地产企业对BIM技术还处于懵懂状态时，万达先行一步，展开了相关领域的研究。

二、功崇惟志，业广惟勤

万达精髓于"任"，发展于"商"，是中国房地产行业的佼佼者，强烈的社会责任感和敢锐的行业境界，让万达意识到建筑数字化的紧迫性，而标准化是数字化发展的一大重要抓手。

如今，万达已经在内部建立起一系列专业的WBIM标准，并依据万达自有项目的数据与研究经验建立了一个在线项目全生命周期的"万达筑云"管理平台，这与国际先进的BIM 发展战略——英国BIM Level 2战略不谋而合，BIM level 2是由英国标准协会（BSI）发布的一套成熟的BIM信息管理标准。在科技高速发展的今天，建筑构件的数字化，三维化已被人们广泛接受，然而"数据和信息"作为真正推动建筑业发展的价值所在，却极少被人们关注，万达作为行业的先行者，率先意识到了数据/信息管理的重要性。

WBIM数字化大厅展现智慧园区时代广场大屏

万达信息数字化管理系统

2. Ir Dr Llewellyn Tang and Dr Greg Chan

- Llewellyn and Partners Company Limited (LPC), as a building information modelling (BIM) innovation start-up of HKU, has been commissioned by the Construction Industry Council (CIC) to conduct the world's largest industry-scale BIM Adoption Survey 2020 for the architecture, engineering, construction, owner and operator (AECOO) industry of Hong Kong. The Survey has reached 1,497 organisations and received 483 responses in the seven stakeholder groups below:

  i. Government Departments
  ii. Statutory Bodies
  iii. Main Contractors
  iv. Subcontractors
  v. AEC Consultants
  vi. BIM Consultants
  vii. Real Estate Developers and Asset Owners

This report, led by Ir Dr Llewellyn Tang and Dr Greg Chan, will serve as an essential benchmark for the industry to maintain its competitiveness on how BIM can be adopted successfully in the next 3-5 years in Hong Kong. An overall 4% improvement in BIM adoption is found compared to the result in 2019.

Other key findings include:

- Support for small and medium enterprises (SMEs) BIM adoption
- Push-pull approach for private sector
- Key Performance Indicators (KPIs) for the push-pull approach (4% improvement in BIM adoption; 5% improvement in BIM index; 12% improvement in BIM maturity; 30% improvement in top 6 BIM uses; and 39% improvement in BIM uses with 50%+ benefits.)
- Investment for the BIM talent
- OpenBIM approach and Common Data Environment
- Culture change for SME leaders
- A showcase of BIM leaders with innovative practices

Reference:

Tang, L.C.M., **Chan, G**., Chan, C., **Zhang, Z., Zheng, Y., Yi, X., Mok, A., Mak, D.** (2021) *BIM Adoption Survey 2020*, Construction Industry Council, Hong Kong.

Public-facing report:

https://www.bim.cic.hk/en/resources/publications_detail/87?back=%2fen%2fresources%2fpublications

Related webinars:

https://www.bim.cic.hk/zh-hant/events/detail/276
https://www.bim.cic.hk/en/events/detail/331

- delivered the BIM Manager Professional Training in 2019/2020.

Following a strategic cooperation between the Faculty of Architecture, British Standards Institution (BSI), and Professional Construction Strategies Group (PCSG), the three parties jointly held the Digital Infrastructure and Construction Summit 2019 on 25 April 2019.

As the CIC-Certified BIM Manager and CCBM Assessment Panel member for the Construction Industry Council (CIC), Ir Dr Tang designed the Global BIM Manager Professional Training Course with his team and BSI, which was recognised as a CIC accredited BIM Manager Course. Led by Ir Dr Tang and Dr Greg Chan, the team had trained over 160 delegates from over 40 units from both public and private sectors from Hong Kong, China and Malaysia.

AECO行業數字化進程的人才培養

英國標準協會及香港大學攜手打造BIM課程

「數字化革命」幾乎影響我們日常生活每一個範疇，建築環境自然亦不例外，由樓宇設計、建築工程到基礎設施開發和持續資產管理，建築環境行業正在經歷數碼轉型，其中一個關鍵的元素便是建築信息模擬（BIM）。

BIM是指在建築設計、施工及整個建築或資產生命周期中提供並管理建築資訊的過程。它從所有相關方如主承辦商到分包商、專家和專業人員之間創造共同語言，共享知識和提高透明度。它提供管理成本、時間尺度和材料數量的框架，從而優化建築項目的效率。

自2016年4月4日起，英國政府規定所有政府工程項目都必須使用BIM Level 2，而BIM在其他國家如新加坡、南韓、加拿大和中國等的應用也越來越普遍。香港的政府部門，如建築署、機電工程署及水務署亦有在不同範疇運用BIM。香港政府在2017年規定任何政府基本工程項目預算超過300萬元，項目的設計和建造必須採用BIM技術，並鼓勵私人工程項目跟隨。

首間提供建築信息模擬經理課程機構

在過去的30年中，一些行業分析機構，揭露了建築（AECO）行業數字化水平低下的問題，大部分建築企業沒有意識到數字化的價值及緊迫性，只有少數企業看到數字化的長期投資回報，並且處於數字化轉型中。BIM作為一種顛覆性技術，為行業發展提供了新的視角。

為促進BIM在香港的發展，建造業議會（議會）推出了建築信息模擬認可及認證計劃，以評核建築信息模擬人員的能力及確保本地培訓課程的質量。議會在2019 年 8 月 1 日舉行建造業議會建築信息模擬認可及認證計劃證書頒發典禮。議會執行總監鄭定寧工程師於典禮上提及BIM是將來建築業界的必然工具，希望香港將會更廣泛使用BIM。

由英國標準協會（BSI）和香港大學聯合舉辦的BIM經理專業培訓課程（Global BIM Manager Professional Training），在這個創新和革命的浪潮中發揮著重要作用，並成為第一間提供議會認證的建築信息模擬經理課程的機構，提供高質量的培訓課程，使學員具備適當的技術和能力，達至國際水平。

課程由香港大學建築學院房地產及建築系部誰明博士及Women in BIM 主席Ms Rebecca De Cicco 共同擔當，並由PCSG有限公司主席暨會員福德大學客座教授Dr Mark Bew擔任課程顧問。

課程集視於香港建築行業，將視角延伸到全球範圍內的行業數字化發展，旨在從各個角度提供高水準的專業培訓，其中包括基礎概念，客戶及產業鏈支持的BIM策略，國際BIM標準，技術趨勢，數字信息管理，基於ISO的通用數據環境（CDE）及商業運用和合同管理等各個方面。

課程吸引著來自不同的組織或政府部門的學員。在前三期的課程中，學員們分組進行了一系列的活動和研討，他們在組內外進行了積極的討論，分享他們在信息管理和數字學生方面的實踐經驗，並從中受益。通過為期五天高參與度的課程，他們大大提升了作為經理的認知和能力，包括該如何達至BIM價值最大化，如何令業主和產業鏈受益於項目信息模型（PIM）和資產信息模型（AIM），以及如何利用資產信息和全生命周期數據，推動組織層面上BIM行業數字化進程中應用的高屋流管理策略。

到目前為止，大部分學員反映，在香港建築行業中，從業人員的專業能力不足是影響行業數字化發展的最大障礙之一。這次培訓的價值不只在於“是什麼”，而在於“為什麼”，從而從業者可以通過建立自己的知識庫來深刻感知並真正傳遞應該“如何做”。

鄧教授表示：「通過這次培訓，學員們可以更了解國際和本地的BIM標準（ISO 19650和HK CIC BIM標準）和認證體系，為公司在下一階段實施ISO BIM過渡奠定堅實的基礎。它還有助於區分AECO行業，並達至全球共享最佳實踐效益最大化。」

課程已登記成為「再工業化及科技培訓計劃」及 建造業創科基金的資助課程，符合相關資格的學員可以申請資助。

BIM標誌著重要的里程碑

Dr Mark Bew表示「課程的建立以及它將數字化證程嵌入香港AEC行業擔當重要的作用，標誌著BIM全球進程的里程碑。」

BIM在全球帶來重大的變革，包括變更了複雜項目交付的效率，資產的運營績效以及所產生的社會影響。簡而言之，它正在改變我們的建築環境及社區。

Dr Bew 補充「如今，隨著技術的進步，數字化對資產的設計，建造和維護所產生的積極影響越來越大。」

物聯網（IoT）的出現，捕獲技術和網絡傳感器的進步為我們周圍的環境提供了大量數據。通過實時，我們可以在項目交付過程中連接、聚集和充分利用BIM，IoT和GIS數據集的數據，以助資產或資產組合的整個生命週期內作出更好的決策。

從靜態信息模型到「數字孿生」，通用數據環境（CDE）不斷發展，是一個虛擬項目空間，收集信息來源。學生已經精簡及促進航空航天和製造業等行業的效能及服務，在建築業，學生正帶來前所未有的資產的運營和維護方面的優化，預視並避免問題的出現，確保最後用家或客戶獲得無縫的體驗。

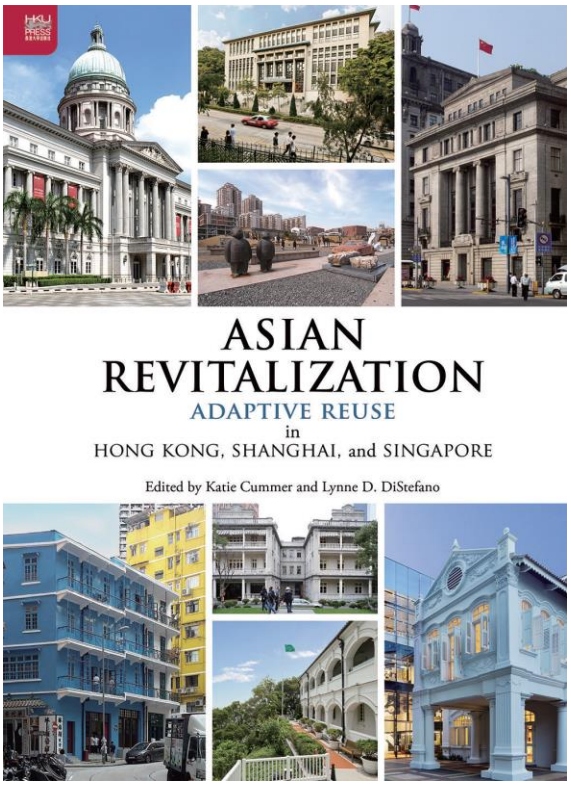
發展數字學生的好處從項目層面提升至國家層面，有助基礎建設的有效管理和規劃，以及「智慧」環境的開發調整至完全滿足其用戶需求。

（資料由客戶提供）

3. Professor Lynne DiStefano

- co-edited with Dr Katie Cummer, a recent publication titled *Asian Revitalization: Adaptive Reuse in Hong Kong, Shanghai, and Singapore.*

  Apart from Professor DiStefano and Dr Cummer, Lavina Ahuja, Hugo Chan, Fredo Cheung, Dr Ho Yin Lee and Dorothy Lau have also contributed in various areas, including indexing, of this book project.



Abstract:

Adaptive reuse refers to reusing an old building for a purpose other than which it was originally built or designed. This conservation approach has become increasingly popular around the world. However, there are few publications that focus on its application in Asia. This book fills this gap by looking at both unique and shared aspects of adaptive reuse in three Asian urban centers: Hong Kong, Shanghai, and Singapore. Building on government policy documents and extensive field work, this book contextualises adaptive reuse in each city and reveals the impetus behind a wide range of projects from revitalisation in Hong Kong, commercial development in Shanghai, to community building in Singapore. The introductory chapter sets adaptive reuse within an international perspective, noting salient differences and similarities between Asia and other parts of the world. It also anchors the discussion within a regional perspective, focusing on the similarities and differences between Hong Kong, Shanghai, and Singapore. Each of the following four essays addresses a specific topic about adaptive reuse, including its relationship to urban development and sustainability, how it benefits heritage buildings, and how it reveals best practices in heritage conservation in Asia. The subsequent three essays, one for each city, supplemented with timelines, set out a clear framework for understanding the city-specific case studies that follow the essays. Afterwards, fifteen representative projects across the three cities are presented as in-depth case studies. The pairing of essays and case studies provides a detailed understanding of each city's approach to adaptive reuse in the twenty-first century; a time when the need for sustainable development solutions are at the forefront. Intended for classroom use and professional readership, this book will be of considerable value in Asia, as well as elsewhere, providing material for stimulating and worthwhile discussion.

More information: https://hkupress.hku.hk/pro/1798.php

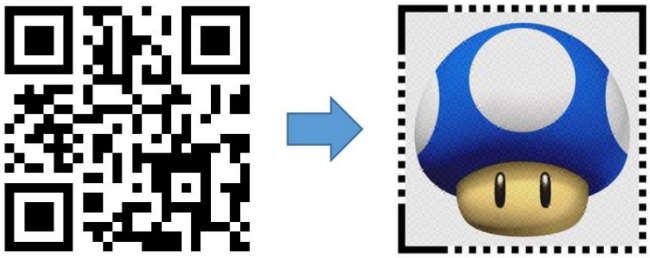
Department of Urban Planning and Design

1. Dr Jun Ma

- has obtained two patents related to his research:

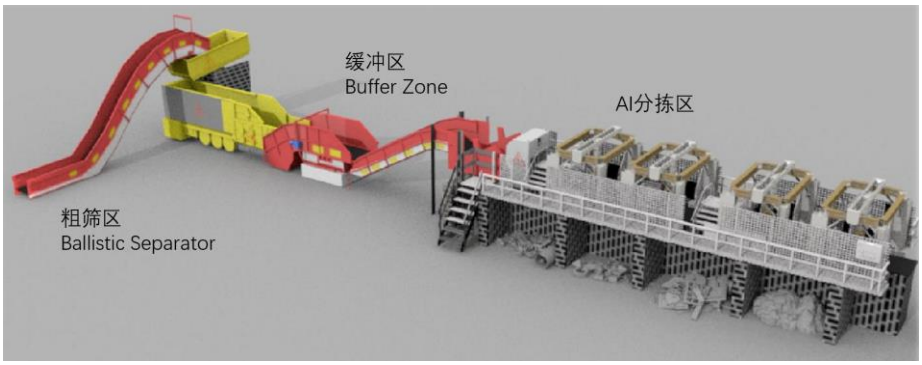
(i) A new image-based Quick Response code (QR code); Chinese patent, ZL 2017 1 0134207.1

This patent is for a new type of 2D Quick Response code. Instead of black-and-white bricks, the new code stores 1/0 information using cross angle colour difference. This technique can turn black-and-white QR codes into self-defined images, upgrading the traditional QR system into a new tool for offline and online commercial marketing and income generation.



(ii) An intelligent waste sorting system; Chinese patent, ZL 2016 1 0337301.2

This patent is for a waste sorting system using computer vision and robotic arms. It can help identify different types of recyclable solid wastes and classify them in real time using robotic arms.



The two patent applications above were filed five years ago, went through rigorous application processes until recently being awarded. The patented technologies have since been advancing in order to make ongoing impact in society, while having received more than 20 awards at municipal and national entrepreneurship competitions, including First Prize at Inno China (2015), Third Prize at Alibaba International Innovation Competition (2015) and the China Innovation and Entrepreneurship Competition of Hong Kong, Macau and Taiwan (2017). It is anticipated that their concepts and related products will be widely accepted by the market in the near future.

Centre of Urban Studies and Urban Planning

1. Dr. Weifeng Li and Xuehui Pi (PhD student)

   - have published the following papers:

   (i) **Pi, X.,** Feng, L., **Li, W.,** Liu, J., Kuang, X., Shi, K., Qi W., Chen D., & Tang, J. (2021). Chlorophyll-a concentrations in 82 large alpine lakes on the Tibetan Plateau during 2003–2017: temporal–spatial variations and influencing factors. *International Journal of Digital Earth*, 1-22. DOI: https://doi.org/10.1080/17538947.2021.1872722 (corresponding author)

   ***Abstract**:*

   As essential parts of the unique ecosystem of Tibetan Plateau (TP), the sizes and associated physical properties of alpine lakes have long been investigated. However, little is known about one of the most critical biogeochemical properties, i.e. the Chlorophyll-a (Chl-a) concentrations. Here, for the first time, we presented a comprehensive investigation of the temporal–spatial variations in Chl-a in 82 lakes (>50 km^2) across the entire TP region, based on MODIS observations in the period of 2003–2017. The results showed that the 82 lakes exhibited an average long-term mean Chl-a of 3.3 ± 3 ±3.3 $^{-3}$, with high Chl-a lakes concentrated in the eastern and southern inner TP basin and northeastern parts of the TP. An interannual trend analysis revealed that lakes exhibiting (significantly) decreasing Chl-a trends and (significantly) increasing Chl-a trends were comparable in numbers but differed in distribution patterns. A correlation analysis indicated that at least 70% of the interannual variability in Chl-a values of lakes was significantly correlated with one of the four environmental factors (wind speed, ice cover duration, lake water surface temperature and surface runoff) and lake size. In addition, glacier meltwater tended to reduce lake Chl-a while salinity levels showed minor influences.

   (ii) **Pi, X.,** Feng, L., **Li, W**., Zhao, D., Kuang, X., & Li, J. (2020). Water clarity changes in 64 large alpine lakes on the Tibetan Plateau and the potential responses to lake expansion. *ISPRS Journal of Photogrammetry and Remote Sensing*, 170, 192-204. DOI: https://doi.org/10.1016/j.isprsjprs.2020.10.014

   Abstract:

   Lakes are essential components of the water cycle and ecosystems. Therefore, the ecology and water security of lakes is of great concern. However, on the Tibetan Plateau (TP), which is known as the Asian water tower, knowledge of lake water quality is in its infancy. In this study, we developed a Moderate Resolution Imaging Spectroradiometer (MODIS)-based Secchi disk depth (Z_{sd}) retrieval model and used the proposed model to study the temporal and spatial dynamics of water clarity in 64 lakes (>50 km^2) located on the TP during the 2003–2018 period. The results show that the 64 lakes have an average long-term mean Z_{sd} of 4.4 ± 3.0 m, where lakes in the northern TP generally exhibited lower Z_{sd} levels than those located in the southern and northeastern parts of the TP. Among all selected lakes, the number of lakes showing (significantly) decreasing Z_{sd} change trends was approximate to those showing (significantly) increasing change trends. Nevertheless, the two trends exhibited different spatial patterns. An analysis of the potential links between lake Z_{sd} and environmental factors suggests that lake expansion is an essential factor affecting the increase in lake Z_{sd}, while such an impact may be offset by the increase in phytoplankton

induced by climate change in lakes showing a significant Z_{sd} decreasing trend. In addition, land use types are partially responsible for the Z_{sd} disparities between different lakes since lakes with high Z_{sd} commonly occurred with high vegetation cover in their surrounding areas, while glacial melting and hydrological networks showed minor influences. This study is expected to enhance our understanding of lacustrine environments in TP and other global alpine lakes under the scenario of climate change.

2. Dr. Weifeng Li

- has published the following papers:

(i) Guo, H., Wei, J., Li, X., Ho, H. C., Song, Y., Wu, J. & **Li, W**. (2021) Do socioeconomic factors modify the effects of PM1 and SO2 on lung cancer incidence in China? *Science of the Total Environment*, 756, 143998. DOI: https://doi.org/10.1016/j.scitotenv.2020.143998 (corresponding author)

Background
It remains uncertain whether socioeconomic factors modify the effect of air pollution on human health. Moreover, studies investigating socioeconomic modifying roles on the effect of PM1 are quite limited, especially in developing countries.

Objectives
The present study aims to investigate socioeconomic modification effects on the associations of the incidence rate of male lung cancer with ambient PM1 and SO2 in China.

Methods
We conducted a nationwide analysis in 345 Chinese counties (districts) between 2014 and 2015. In terms of multivariable linear regression models, we examined the modification effects of urban-rural division, education level and proportion of construction workers in the stratified and combined datasets according to the tertile and binary divisions of the three factors. Moreover, we performed three sensitivity analyses to test the robustness of socioeconomic modification effects.

Results
We found a larger effect of PM1 on the incidence rate of male lung cancer in urban areas than in rural areas. The association between PM1 (or SO2) and the incidence rate of male lung cancer was stronger in counties with low education levels than in those with high education levels. The findings of the significant modification effects of urban-rural division and education level were robust in the three sensitivity analyses. No significant modification effect was observed for the proportion of construction workers.

Conclusions
Male residents in urban areas have a high risk of lung cancer incidence associated with ambient PM1. Male residents with low education levels suffer from larger effects of PM1 and SO2 on the incidence rate of lung cancer. Area- and population-specific strategies should be developed to reduce the urban-rural and educational disparities in air pollution effects, which thereby alleviates air pollution-associated health disparities in China.

(ii) Chang, Z., **Li, W**., Li, X. & Deng, C. (2021) Waste disposal and housing price: new evidence from the landfill clean-up program in Hong Kong. *Journal of Environmental Planning and Management*. DOI: https://doi.org/10.1080/09640568.2020.1838265 (forthcoming)

Abstract:

Accurately measuring the costs and social benefits of environmental programmes may have significant public sector policy implications. When considering environmental programmes, governments may choose to conduct landfill clean-ups to improve urban living environments and health. However, these programmes may generate substantial costs, and it is not clear whether their social benefits can recover these costs. Since the 1990s, the Hong Kong government has restored 13 closed landfills. This study seeks to quantify the short-term social benefits of this landfill clean-up programme by measuring its impact on the housing market. Using the difference-in-differences method, we find that housing prices near landfill sites increase about 2.2%, on average, within two years after landfill restoration. However, housing prices show no further change after the restored landfill sites are redeveloped into urban parks and other facilities. We argue that removal of the stigma effect is likely the main channel for housing price hikes. Through a back-of-the-envelope estimation, we find that the social benefits from housing value appreciation can sufficiently recover the programme costs.

i5 BIM Research Group

The i5 BIM Research Group studies the state-of-the-art and cutting-edge R&D contributions of A.I. technologies to Building Information Modelling (BIM) for the delivery of future smart assets. The main research goal of the Group is to simulate virtual representations of real-world assets to enable 'better' decision-making through-life for the Architecture, Engineering, Construction and Operations (AECO) industry. The four core 'I's are Internationalisation, Innovation, Interdisciplinary and Impact, which realisation is based on the University's vision for 2016-2025: '(3+1)Is: Internationalisation, Innovation and Interdisciplinarity, which converge to create collective Impact.' The fifth, final 'I' is A.I.

Funding/Grant:

- In May 2020, the Group was awarded the Innovation and Technology Fund (ITF) by the HKSAR via the Technology Start-up Support Scheme for Universities (TSSSU), to commercialise the BIM Warehouse project. Ir Dr Llewellyn Tang's start-up, LPC, subsequently received a three-year grant from the Hong Kong Science and Technology Parks (HKSTP) in August 2020.

Student Achievement:

- Mr Mengtian Yin (REC PhD student jointly supervised by Ir Dr Llewellyn Tang and Dean Chris Webster) was awarded at the Chi Sun Hack 2019 competition for his project 'Credit-based Solar Energy Optimization System'.

Published Refereed Journal and Conference Papers:

(i) **Yin, M.**, Wu, Z., Wen, Y. & **Tang, L.** (2021) Visualize GIS, BIM and IoT data for comprehensive green building parameters monitoring, *The 8th International Conference on Innovative Production and Construction, IPC 2020 – 'Towards Advancement in Technologies and Processes for Smart Buildings and Construction'*, 7-8 December 2020, Hong Kong.

(ii) **Yin, M., Tang, L.**, Zhou, T., **Ya, W**, Xu, R. and Deng, W. (2020) Automatic layer classification method-based elevation recognition in architectural drawings for the reconstruction of 3D BIM models, *Automation in Construction*, 2020, May, no. 103082. DOI: https://doi.org/10.1016/j.autcon.2020.103082

(iii) **Tang, L.** (2020) ISO 19650 – an international approach to support digital twins' creation for better asset management, *HKIBIM 10th Annual Conference – From BIM to Built Asset Information Management*, 9 January 2020, Hong Kong.

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(xi) **Yin, M**., Ye, Z., **Tang, L.** and Li, S. (2019) An automated layer classification method for converting CAD drawings to 3D BIM models, In I. Mutis & T. Hartmann (Eds.), *Advances in Informatics and Computing in Civil and Construction Engineering*, p. 67-76. Cham: Springer, 2019. *DOI: http://dx.doi.org/10.1007/978-3-030-00220-6_9*

(xii) **Wen, Y.** and **Tang, L.** (2019) A conceptual framework and information collection strategy of space-oriented BIM-based FM solution of hospital projects. *CIB World Building Congress 2019 'Constructing Smart Cities'*. Hong Kong, China, 17-21 June 2019.

(xiii) **Zhang, Z.** and **Tang, L.** (2018) Intelligent transportation based on BIM in a new smart city, *ICCF2018: International Conference on Construction Futures*, Wolverhampton, UK, 19-20 December 2018.

(xiv) **Wen, Y.** and **Tang, L.** (2018) Thinking from barriers to the BIM-based building operational phase – A case study in China, *ICCF2018*: *International Conference on Construction Futures*, Wolverhampton, UK, 19-20 December 2018.

Keynotes and Talks:

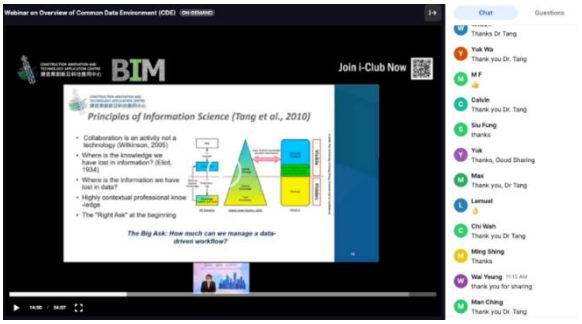
(i) Invited by the Hong Kong Trade Development Council and Asian Financial Forum, Ir Dr Llewellyn Tang presented on 19 January 2021 his vision for the AEC industry and how his start-up company's revolutionary R&D digitalisation solutions empower the smart city for the construction's next normal.

(ii) Ir Dr Llewellyn Tang gave an online talk for the Construction Industry Council, at the CDE Webinar Series: Webinar on Visualization and Integration Hub, on 10 July 2020. Watch the webinar at: https://www.bim.cic.hk/zh-hant/events/detail/243

(iii) Invited by the Hong Kong Institute of Housing (HKIH), Ir Dr Llewellyn Tang gave a talk on 'ISO 19650 – An International Building Information Modelling (BIM) Approach for Better Asset Management', on 22 December 2020.

(iv) Ir Dr Llewellyn Tang gave a keynote on 'Cultivating Digitalization Talent for the Next Normal in Construction Industry', at the 11th Digital Annual Building Summit, on 27 August 2020, for Glodon Company Limited. The presentation was well-received by more than 12,000 delegates online globally.

(v) Ir Dr Llewellyn Tang gave an online talk for the Construction Industry Council, at the BIM X CITAC Common Data Environment (CDE) Webinar Series: An Overview of a CDE, on 28 April 2020. There, he gave an overview of a CDE workflow, solution, information management principles and its R&D for the AECO industry. Watch the webinar at: https://www.bim.cic.hk/zh-hant/events/detail/206



(vi) Ir Dr Llewellyn Tang presented a paper titled 'ISO 19650 – An International Approach to Support the Creation of Digital Twins for Better Asset Management', at the HKIBIM 10th Anniversary Conference: from BIM to Built Asset Information Management, on 9 January 2020, Hong Kong.

https://www.hkibim.org/media/2019/HKIBIM-Annual-Conference-2019_Registration%20Form_Flyer.pdf

(vii) Ir Dr Llewellyn Tang gave a talk titled 'ISO 19650 – An International BIM Language Shaping Surveyors' Role for Industry Integration, Digitalization and Innovation', at the HKIS BIM Conference, on 13 December 2019, Hong Kong.

https://www.hkis.org.hk/hkis/general/events/bim-20191118v2.pdf

(viii) Ir Dr Llewellyn Tang was invited to a panel and gave a talk titled '智慧基础设施 BIM-GIS 的标准化', for the conference: 粤港澳大湾区数字交通技术交流大会暨华南智能交通论坛, on 13-14 November 2019.

(ix) Ir Dr Llewellyn Tang gave a talk at the Construction Industry Council BIM Talks X Research Forum, titled 'Making the Most out of BIM and Blockchain for the New Smart City', on 20 February 2019, Hong Kong. His successful story, which had been delivered at TEDx Shanghai in 2018, on using BIM, GIS, IoT and Blockchain technologies to create future new smart cities in China, was shared with the audience. Watch the talk at: https://www.youtube.com/watch?v=vJaDyB5kGtA

(x) The UK-Beijing Embassy invited Ir Dr Llewellyn Tang to give a keynote to their event on Smart City, titled 'Making the Most out of BIM and Blockchain for the New Smart City', on 17 January 2019, Beijing.

(xi) Ir Dr Llewellyn Tang was invited as a panel discussion member to share his views on 'What does the future hold for our next generation?' at the RICS-SCC PropTech Conference 2018, 23 November 2018, Hong Kong.