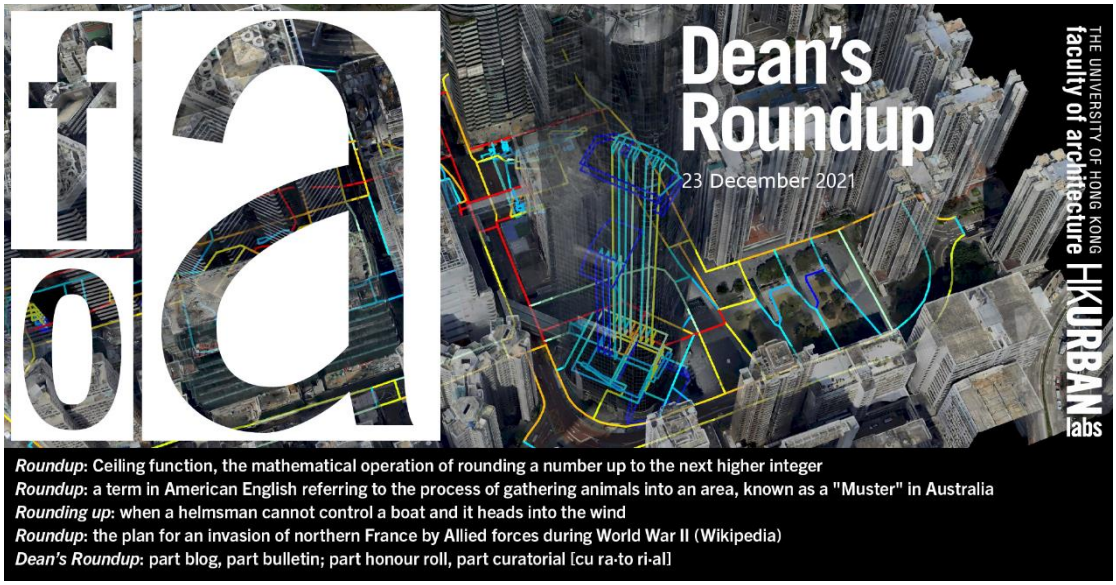


More on Urban Ugliness

Many thanks to Kaicong Wu for picking up the challenge I laid down in the Dean's Roundup on 15 November 2021, titled 'Urban Ugliness'. There are many insightful ideas in Kaicong's blog, below, that are worthy of further exploration. Perhaps we can hold an international workshop or even conference on this question.

Congratulations to colleagues whose contributions are highlighted in the remaining part of this DRup. Reading through the profile of FoA's researchers, as sampled by this final DRup of 2021, I am struck by just how mature, wide-ranging, profound and impactful my colleagues' scholarship is. I am immensely proud to be Dean of this Faculty. I cannot think of such an impressive mix in any other of our benchmarked built environment schools around the world.

Best wishes for a peaceful Christmas and prosperous new year, whatever that may mean for you.

Chris Webster
Dean, FoA

Response to 'Urban Ugliness' by Kaicong Wu

In last month's Dean's Roundup, entitled '*Urban Ugliness*', Prof Chris Webster asked us a thought-provoking question: 'what makes so many vernacular urban spaces so beautiful and so many modern urban spaces so uncomfortable if not downright ugly?'

To paraphrase his argument, contemporary cities lack poetic urban spaces that have spontaneously emerged from individual craftsmen's design and construction decisions. A further question is whether the applications of robotic

architecture can solve such a problem in the future, by scaling-up design intelligence and construction variations that used to happen among the craft workers.

After some dialogue about the idea blog, the Dean invited me to pen a response for DRup. This is a difficult but truly inspiring question, which I cannot answer alone. Therefore, I hope that other colleagues in our faculty will add to the discussion. I fully agree that one of the most fascinating properties of vernacular buildings and urban spaces lies in their local variations and the imperfections of form. However, at the same time, we are facing a sharp contradiction. When we build architecture and urban spaces on a large scale, if every component of the built structure is spontaneously adjusted by individual craft workers, we might never be able to complete the project. Thus, in modern cities, the imperfections and variations of form and hence the corresponding individual intelligence of craftsmen are often reduced by regulation, mass-production, and standardisation. It seems that certain performances that modern life demands in relation to comfort, efficiency, or density cannot be compromised, even if everyone appreciates the foothills of the High Atlas Mountains in Morocco, the row houses in Britain's Victorian streets, or the canal-scapes of medieval Venice.

As an architectural designer and researcher, I am frustrated because unfortunately we end up with unappealing and reproduced cities, and everyone wants to change them. Thus, the multifunctionality and precision of robotics become promising resources that can potentially be used to resolve the contradiction, and create more poetic architecture and urban spaces. However, I believe we need to make effective changes to at least two aspects of this area to let that happen. One is technical, and the other is conceptual.

The Autonomous Machine

The first change that needs to happen is how machines are used, and especially how they are programmed, in relation to computing and fabrication. Before robotics were applied to the construction of the built environment, the spontaneous variations, or nuances of forms, conflicted with the performative objectives of contemporary architecture, especially that of the constructability. Even using parametric models, writing a code to adapt an architectural form to a previously unknown site can take forever to calibrate, and will probably only work for one specific site. In theory, especially with ideal lab settings, such variations of form and site adaptiveness can be reformed. Using sensing technologies, robotic fabrication, and automatic assembly, many decisions that used to be made in the design or planning processes can now happen on site in real time. The imperfections of materials, site topographies, surrounding buildings, and environmental conditions can be detected by sensors to recalibrate robotic toolpaths. Any change of a single building component will lead to the reconfiguration of all the other parts. Endless fabrication possibilities and on-site decision making could be realised, thus freeing us from reproduction.

However, robotic fabrication technologies have been borrowed and applied in the building industry for at least 30 years. Why have our buildings and cities still not recovered those poetic variations which only used to happen among vernacular buildings and cities? One problem is that the way we use our machines is still not driven entirely by autonomous systems. From freeform geometric, to parametric, to building information modelling, although these methods are constantly evolving, most design-to-production processes still require the construction rules to be compiled manually by the architectural designer, engineer, or computational specialist. These manual programming procedures are still influenced, if not constrained, by the formal complexity and the requirement of constructability. In other words, multifunctional and precise industrial robots with a high degree of freedom, do indeed add extra workloads for the designer and programmer. As a result, in the limited project cycle, many spontaneous changes and adjustments will eventually be abandoned by the project management who are concentrating on the performative optimisation of the building or urban space.

All these struggles could be fundamentally changed if the machines and the design computing procedure were autonomous. For computing, we can already use generative design technologies to automate the evaluation processes and to adjust the design parameters. We can use deep neural networks to analyse the architectural styles and spatial organisations, utilising both 2D and 3D databases. For construction, industrial robots can adjust the manufacturing toolpaths according to the new design instructions which are computed according to the sensory data detected by the computer vision systems. The most contrasting strategy of applying these autonomous systems is that no one is writing the code, but the design and construction instructions are programmed autonomously through a continuously improved machine learning process (which, tediously, can only be set up for one time). However, just like the robots, the autonomous systems and intelligence technologies were not originally invented to ‘solve’ design problems. We must make the fundamental improvements by ourselves, as well as solving many extremely difficult technical problems, as no one else will understand the design objectives better than the architect.

Design Process Modelling

In addition to developing architectural autonomous machines, the conceptual change needed is to understand what spontaneous decisions are relevant, and what kinds of local variations in the urban spaces are meaningful. This is a question related to the design process and how it is understood, a field which is also defined as design theories and methods/design thinking. While the energy crisis, social problems, and environmental issues have gradually become urgent, the design thinking model has been debated for more than half a century. Design theorist Horst Rittel is an important figure who must be mentioned. After he moved from the Ulm Design School to UC Berkeley, he started to develop his ideas further about understanding design as an

argumentative process (Protzen and Harris 2010), an insight which I believe still affects architectural education today. The argumentative design model is powerful, because although design problems – defined by Rittel as the 'wicked problem' – cannot be solved, they can still be improved by making arguments. This means that to design is to use different arguments and evaluation criteria to support or contradict our solutions. I do see that quantitatively evaluating the various properties of the built environment, including the consumption of energy, the fabrication of materials, and the improvement of structures, makes the design process more transparent and design solutions further improved.

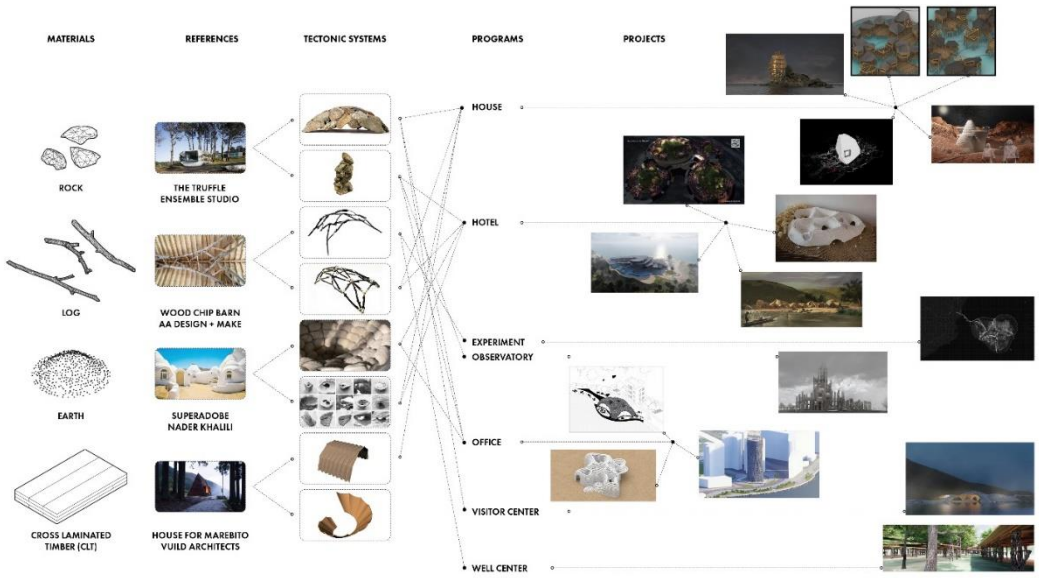
However, today, based on this model, if we want to realise the poetic variations of urban spaces, we need to do more, and to develop evaluation methods for the non-performative properties. This is not to say that we should give up performative evaluation (most of my research so far relies on the results of performative evaluation), but rather that I just want to emphasise that performative evaluation is not enough. Because if we compare vernacular, Medieval, Renaissance, Victorian, and contemporary architecture and urban spaces, we may find that many contemporary buildings are not appealing enough. However, after modelling and analysing, it is likely that we will discover that their thermal performances, structural efficiencies, and programme arrangements are the winners from all of the groups above. Therefore, I very much doubt whether it is because we excessively emphasise finding the optimal solutions for performance, making our design choices fewer, and eventually losing those non-performative, poetic expression capabilities. If we recall the most attractive buildings and urban spaces in the world, what appears in our minds are not usually their energy consumption, structures, and ventilation analysis models, but rather the poetic or symbolic characteristics of the architectural forms.

Evaluating such non-performative features has so far been accomplished by the architectural and urban designers using their empirical knowledge. However, now deep learning technology allows machines to use statistical models to find the patterns of design languages and their corresponding contexts from all of the existing architectural forms (Chaillou 2020) (if they can be collected, structuralised, and labelled). In other words, the application of intelligence technologies should not only compute how well the built form has been optimised, but also they should enable non-performative features to be numerically (if not quantitatively) evaluated. At the same time, the additional responsibility of architects and urban designers goes beyond finding 'efficient' forms, to negotiating various performance criteria, and finally to expanding the poetic potential of architectural forms. It is even possible that in order to increase the non-performative values, we need to consciously suspend some performative optimisations so as to free up the design space for local form variations. Otherwise, based on all the performative evaluation criteria, we compute an optimised architectural form, but it is still possible that such a form is mediocre in terms of its poetic meaning. For vernacular architecture, there have been thousands of years of iterative evolution by individual craft workers. The geometric and construction rules of vernacular architecture can be

simulated by computer programmes. However, without non-performative evaluation, what we simulate might just be an overly simplified rule-based model missing all the complex cultural meanings.

Pilot Study

In the following diagram, I am going to share the workflow of a MArch design studio that I am co-teaching with Dr Kristof Crolla this year. This is just to show our very early-stage attempt to experiment with architectural design utilising the two changes mentioned above. Although robots are not used for all the projects, we have been using evolutionary computation, 3D scanning, and mixed reality to develop tectonic systems with natural materials, such as rocks, earth, wood logs, and cross-laminated timber with minimum editions. Through the automation of multiple evaluation criteria such as fabrication cost, structural performance, site topography, and programme requirements, even irregular materials can be manipulated at a scale that is not attainable by manual operations, which can provide us with a wide range of design choices. Now, having finished the design studio, I can see that the most difficult part we have encountered is not the computing or fabricating problems, but the evaluation and discovery of the non-performative values of these forms.



Kaicong Wu

References

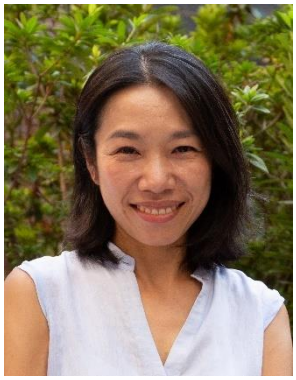
1. Protzen, J.-P., & Harris, D. J. (2010). *The Universe of Design: Horst Rittel's Theories of Design and Planning*. Routledge.
2. Chaillou, S. (2020). ArchiGAN: Artificial Intelligence x Architecture. In P. F. Yuan, M. Xie, N. Leach, J. Yao, & X. Wang (Eds.), *Architectural Intelligence: Selected Papers from the 1st International Conference on Computational Design and Robotic Fabrication (CDRF 2019)* (pp. 117-127). Springer. DOI: https://doi.org/10.1007/978-981-15-6568-7_8

Faculty of Architecture

1. Faculty Teaching Awards 2021

   - A unanimous decision was made by the Selection Panel to make the Faculty of Architecture Teaching Awards to the following:

     - Ms Vincci Mak
       Senior Lecturer, Division of Landscape Architecture



     - Ms Susanne Trumpf
       Senior Lecturer, Division of Landscape Architecture

The Panel was impressed with the awardees' dedication to teaching, and their innovative pedagogical approaches to enduring excellence to enhance student learning experiences and learning outcomes.

The Dean would also like to thank in particular the external assessors, Dr Cecilia Chan of CETL, and Ms Didi Mak, student representative of the Faculty Board, for their valuable input.

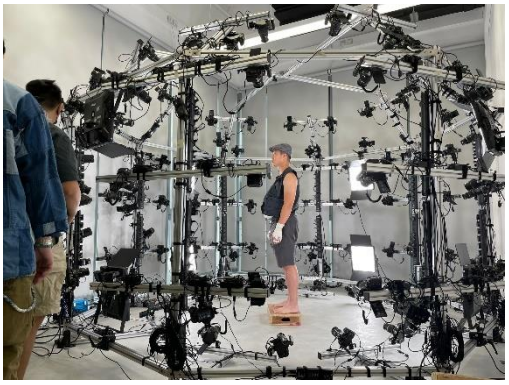
Department of Architecture

1. Thomas Tsang

   - has been invited by the Osage Art Foundation to participate in the Hong Kong Jockey Club Charities Trust Interdisciplinary Cultural Education Programme, on the Integration of Arts and Technology for Local Students for two years from September 2021 to September 2023.

     The proposed project, entitled 'Augmented Reality (AR) Educational Project', will be conducted in the form of a workshop, aims to nurture collaborative and interdisciplinary experience of Junior Secondary students (Forms 1 to 3) in Hong Kong in the fields of Visual Arts, Architecture, Design, History, Science and Performance, and New Media Arts through the use of new technologies and Augmented Reality. The project explores a critical topic that goes beyond classroom teaching through creative practice-based learning.

Venue: Tai Kwun

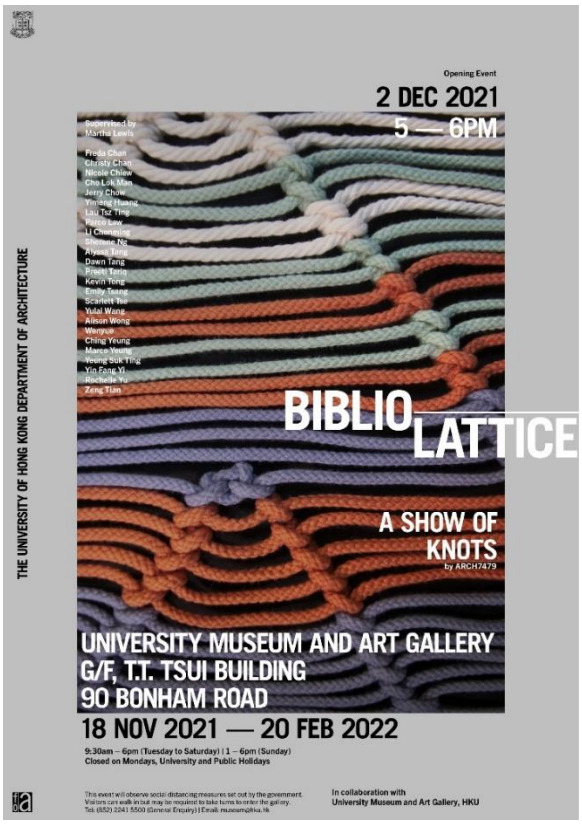


Venue: HKDI

     Thomas is commissioned to develop innovative teaching models through the integration of four core elements, namely art, culture, history and technology, as a means to cultivate a critical awareness of and thinking through media and social issues and the learning process of the workshop.

     This programme is in collaboration with HKBU's Academy of Visual Arts (AVA), HKAPA's School of Theatre and Entertainment Arts, and HKDI's Department of Communication Design and Digital Media.

2. ‘Bibliolattice – A Show of Knots’ Exhibition



- This temporary installation is created specifically for the HKU University Museum and Art Gallery, by students from the architecture and landscape architecture programmes, led by artist Martha W. Lewis. ***Bibliolattice*** is a collective artwork which structure is suspended from the ceiling, and which combines individual macrame knotworks into a cohesive whole.

  This unique structure is the culmination of the MArch Disciplinary Elective Course, ARCH7479 Temporary Site-Specific Installation, from the fall semester, 2021-22. The inspiration for the lattice works derives from grid systems in parametric architecture, from items studied by the class in the Museum’s historic collection, and from the interior design fittings of the Museum itself.

  The current museum exhibitions: *Reflected Beauty* and *High Gothic*, were also seminal in the construction and conception of this work. Light, which filters through gaps between the macrame weaves, is reminiscent of light filtered through the intricate framing of High Gothic stained glass, and the delicate interplay of the antique sepia-toned colour palette was directly inspired by the carpets, paintings and embroideries the class examined when doing research for the project. All students collaborated to make a unique, contemporary handmade work celebrating the history, labour, craftsmanship and refined scholarship that make up the museum, its publications and culture of learning.

Bibliolattice refers to the books and the knowledge flowing within this serene environment, transforming the visual idea of books and carved frames into the softer structural presence of knotwork grilles, and ornate string lacework into a festive cluster floating above the texts and the visitors, hovering over the archive as a welcome and a fanfare.

Participants: Freda Chan, Christy Chan, Nicole Chiew, Cho Lok Man, Jerry Chow, Yimeng Huang, Lau Tsz Ting, Parco Law, Li Chenming, Sherene Ng, Alyssa Tang, Dawn Tang, Preeti Tariq, Kevin Tong, Emily Tsang, Scarlett Tse, Yulai Wang, Alison Wong, Wenyue, Ching Yeung, Marco Yeung, Yeung Suk Ting, Yin Fang Yi, Rochelle Yu, Zeng Tian

Exhibition Period: 18 November 2021 – 20 February 2022

Opening Hours: 9:30 am – 6:00 pm (Tuesday to Saturday)
1:00 pm – 6:00 pm (Sunday)
Closed on Mondays, University and Public Holidays

Venue: HKU University Museum and Art Gallery
G/F T.T. Tsui Building, UMAG, HKU
90 Bonham Road, Pokfulam, Hong Kong

Division of Landscape Architecture

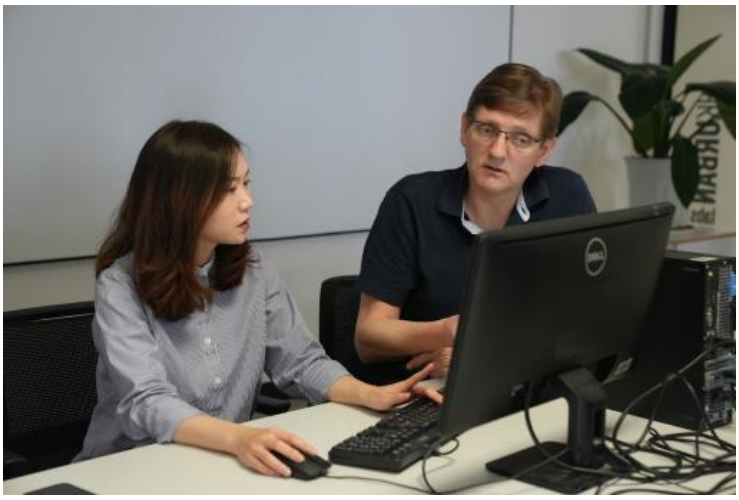
1. Dr Binley Chen

   - has been appointed on Dean's recommendation, by the Landscape Architecture Frontiers Journal, to be a founding member of its Executive Editorial Board, for a term of three years.

     An inaugural meeting of the Board was held in Guangzhou on 16 December 2021.

2. Mr Mathew Pryor and Ms Lynn Hanyuning Lin (Senior Research Assistant)

   - have won Bronze at the Quacquarelli Symonds (QS) Reimagine Education Awards 2021, in the category of ICT Tools for Teaching, Learning and Support, for their project 'Digital Exhibition Space' (DES).



'Digital Exhibition Space' (DES) is a pedagogical innovation based on the creative use of 3D virtual technologies to generate a socialised e-learning laboratory, in the form of a gallery exhibition, to make learning process and outcomes visible. Students learn and achieve learning objectives by working together to build and curate presentations of their coursework, and by visiting and giving feedback on their classmates' work.

Recognised as the 'Oscars' in Education, the QS Reimagine Education Awards' extended panel of over 200 international judges select winners with innovation, scalability, efficacy, and uniqueness as the criteria of achieving outstanding standards.

HKU Press Release: http://www.hku.hk/press/news_detail_23741.html
QS Reimagine Education Awards: https://www.reimagine-education.com

Department of Urban Planning and Design

1. Professor Shenjing He

   - was invited to present at the Panel Discussion on Gentrification in Hong Kong, organised by Urban Land Institute, on 18 November 2021. More information: https://bit.ly/3dhTzUZ

   - was invited to give an online talk entitled ‘Recent Progress in Urban China Studies’ at Central University of Finance and Economics, on 23 November 2021.

   - was invited to serve as a discussant for an online seminar entitled ‘Governing Chinese Neighbourhoods: Models and Beyond’, organised by the Bartlett School of Planning at UCL, on 8 December 2021.

2. Professor Bo-sin Tang, Mr Roger Tang and Dr Jiangping Zhou

   - organised with MSc Urban Planning Year 2 students the Island South Community Planning Workshop at St. Peter’s Secondary School in Aberdeen on 20 November 2021. This workshop was part of a public engagement exercise in the Community Planning Studio course with a view to formulating a neighbourhood improvement plan for the Island South districts. Participants included professional practitioners and local residents.




3. Dr Derrick Ho

- has been appointed as a member of the Appeal Tribunal Panel (Buildings), an independent unit under the Development Bureau of the HKSAR Government, from 1 December 2021 to 30 November 2024.

  Source: Membership – Appeal Tribunal, Buildings Ordinance – Development Bureau (atb.gov.hk)

4. Professor Anthony Yeh

- led an interdisciplinary research team to conduct a questionnaire survey of 363 domestic, Hong Kong, and other overseas funded high-tech firms in the Pearl River Delta (PRD) from December last year to May this year in high-tech industries which Hong Kong has excellent innovative research advantages. For the biomedical products and intelligent manufacturing equipment firms that the research team had interviewed, they found that despite Hong Kong's strength in research, there were many barriers in the PRD that needed to be overcome for the firms to use the high-tech innovation, manpower and producer services in Hong Kong. This firm-based survey of high-tech firms in the PRD is part of the research project 'In Search of New Economic Cooperation Models between Hong Kong and the Greater Bay Area' under the Strategic Public Policy Research (SPPR) Funding Scheme of the Policy Innovation and Co-ordination Office (PICO) of the HKSAR government. The research team have completed the 3-year study and will be submitting the final report to PICO soon.

  A press conference was held on 18 November 2021, which has been well covered by major media in Hong Kong:

  (i) 【大灣區】港大研究：珠三角地區少用香港新科技服務 本港重要性正減退 - 香港經濟日報 - 即時新聞頻道 - 即市財經 - 宏觀解讀 [HKET 經濟日報 | 即時新聞頻道] 2021-11-18
  (ii) 有調查指大灣區內地企業少用香港高新科技 認為合作成本高 [無綫新聞 > 港澳] 2021-11-18
  (iii) 調查：9 成深莞中資企業拒用港產科技　礙港成灣區創科中心 [HK01] 2021-11-18
  (iv) Survey: HK should deepen tech cooperation with GBA cities [China Daily] 2021-11-18
  (v) 港大調查指珠三角企業應用本港高新科技存障礙 [CRHK] 2021-11-18

(vi) Hong Kong Economic Times | 2021-11-19 | A12 | 工商 | By 葉泳珊

珠三角企業 多無應用港科技

涉成本高欠了解 籲多展示研究成果

進軍珠三角

香港不少企業去緩極部署拓展大灣區市場，特別是創新科技企業。不過，香港大學有研究發現，在珠三角內的高新科技企業當中，大部分中資及外資企業亦從未應用香港科技，原因包括成本高、缺乏了解等，反映香港必須解決這些痛點。

■本報記者 葉泳珊

香港大學的研究團隊於去年1月至今年5月期間，在珠三角進行高新科技企業問卷調查及訪談，在深圳和東莞訪問了363間生物醫藥和智能裝備的企業。

負責領導該研究的港大城市規劃與設計系葉嘉安講座教授解釋，該連此兩大類別企業，是考慮到珠三角內的企業種類及香港的優勢所在。

研究發現，雖然香港擁有科技研究的優勢，但有超過9成中資及外資企業從未使用香港的高新科技。而且，有正在使用香港科技的企業，大部分總部亦是於香港，子公司需使用科技時，便需要依賴總部決定及獲得技術，據研究指出，不了解香港科技成果、成本高、合作機制不健全，均是企業未有使用香港科技的主要原因。

兩地制度異 減港企發展意慾

除了高新科技外，大部分珠三角的中資及外資企業，亦從未使用本港的生產服務業及人才（詳見表）。葉嘉安分析，導致此情況的原因包括成本高、不了解內地情況、未能符合中國市場的需求等。

舉例而言，由2014年至今的平均工資，香港與珠三角之間的差距一直未有明顯收窄，香港持續高於6,000港元。同時，由於香港大部分創新專利均集中在高端技術，而珠三角比較需要中低端應用。

地理系林初昇講座教授艾福克道，結於公司老闆的角度，兩地的稅收及社會保險等制度已經十分不同，亦會減卻港企，港人到珠三角發展的意慾。

宜推動高新科企 港設子公司

研究結果顯示，香港的科技、服務及人才，大多時主要用家都是港資企業。研究認為，港企必須尋找更多渠道，讓更多珠三角企業了解及接觸香港的高新科技研究成果。除了舉行推廣活動、會議展覽等，葉嘉安建議，香港應推動珠三角高新科技企業在香港設立子公司，而港企亦應到珠三角設廠和分公司，加強兩地之間的互動。

不過整體而言，受訪企業仍然非常看重本港企業在拓展市場、國際營運及企業融資方面的角色。港大城市規劃與設計系許言智博士亦提到，雖然現時不多珠三角企業使用香港的科技及服務，但調查發現有了成企業認為，當未來開拓海外市場時，例如是一帶一路沿線城市，會考慮使用本港的科技及服務。

▲香港大學的研究團隊認為，香港必須尋找更多渠道，讓更多珠三角企業了解及接觸香港的高新科技研究成果。左二是為地理系林初昇講座教授、城市規劃與設計系葉嘉安講座教授及許言智博士。（資料圖）

從未使用香港科技的企業？

	中資企業	外資企業
科技	逾9成	逾9成
人才	近9成	近9成
生產服務	逾8成	逾8成

研究團隊的部分建議

- 鼓勵香港高新科技對接內地市場需求及商業模式
- 投入更多資源，推動香港基礎研究
- 為內地企業及科研人員提供線上電子商務商證
- 推動港企於珠三角設立分公司

資料來源：綜合受訪者

(vii) Hong Kong Commercial Daily | 2021-11-19 | A03 | 產經新聞

逾九成珠三角企業未曾用港科技

服務成本高令人卻步

【香港商報訊】記者姚一鶴報道：近年港府銳意發展創新科技，計劃打造本港成為創新科技中心。不過，香港大學昨日發表一項調查顯示，逾九成大灣區的高科技企業，更願意採用大灣區內地城市的服務和創新科技，而不願採用香港的服務和技術，聘用港人的意願亦不高。研究認為，香港必須尋找更多渠道，讓更多珠三角企業了解及接觸香港的高新科技研究成果。

葉嘉安(右二)建議加強香港與珠三角企業互動。

香港大學研究團隊於去年1月至今年5月期間進行珠三角高新科技企業問卷調查及訪談，在深圳和東莞訪問363家生物醫藥和智能裝備的企業。研究發現，雖然香港擁有科技研究的優勢，但有超過九成中資及外資企業從未使用過香港的高新科技。至於正在使用香港科技的企業，大部分都是在港設立總部，子公司需使用科技時，便需要依賴總部決定及獲得技術。

港大的研究認為，香港必須尋找更多渠道，讓更多珠三角企業了解及接觸香港的高新科技研究成果。除舉行推廣活動、會議展覽等，港大城市規劃與設計系城市研究與城市規劃中心講座教授葉嘉安建議，香港應推動珠三角高新科技企業在香港設立子公司，而港企亦應到珠三角設廠和成立分公司，加強兩地之間的互動，並讓企業更容易參與香港本地的高新科技創新。

開拓海外市場 願使用港服務

研究指出，內地企業對香港認知不足、香港人手成本較高，以及港人不願意到大灣區內地城市工作，成為阻礙香港發展創科中心的一大主因。港大地產系講座教授科初昇補充，由於兩地的住屋、社保、稅制等不同，政府應與內地商討如「港人港稅」等開創性措施，吸引港人到內地工作。

不過，整體而言，受訪企業仍然非常看重本港高新企業在拓展市場、國際營運及企業融資方面的角色。港大城市規劃與設計系許言智表示，雖然現時使用香港科技及服務的珠三角企業不多，但調查發現有七成企業認為，當未來開拓海外市場時，例如「一帶一路」沿線城市，會考慮使用本港的科技及服務。

(viii)Oriental Daily News | 2021-11-19 | A15 |

港高新科技服務 珠三角少用

【本報訊】港府有意叫港商於大灣區發展，惟有大學調查指，在深圳和東莞經營，不論是內資、港資與外資企業，很多也使用珠三角的服務和高新科技，對於香港的服務使用率則較低，主要由於內地市場壯大，競爭力增，加上香港的成本較高，與內地市場需求脫節，令其滲透力下跌等。學者建議要多向內地推廣本地服務等。

香港大學一個跨學科研究團隊，於去年1月至今年5月在珠江三角洲間展問卷調查和訪談，在深圳和東莞訪問了363家生物醫藥和智能裝備的內資、港資和其他外資企業。研究發現香港在推動珠三角高新科技產業發展的重要性正在減退，原因包括內資企業大多使用珠三角和內地其他區域的服務和高新科技，很少使用香港的服務，因香港的成本較高、與內地市場的需求脫節，另又對內地商業模式的滲透不足，令企業不了解香港的生產性服務和高新科技等。而港資和其他外資企業，亦因為珠三角生產性服務和高科技產業迅速崛起，而使用珠三角的服務和高新科技，以致使用香港的服務和高新科技下跌。

■研究團隊建議積極推廣活動，加深香港高新科技企業和內資企業之間的互動。

港大倡加強推廣互動銜接

研究團隊指，要促進香港成為粵港澳大灣區高科技發展創新中心，香港需要尋找多方渠道，讓更多珠三角的內資高新科技企業了解和接觸到香港高新科技的創新成果，包括在珠三角建立子公司，又積極推廣活動，加深香港高新科技企業和內資企業之間的互動，另又優化本港研發環境，完善其上游創新能力，使其與珠三角的中下游互補性創新環節更好地銜接等。

(ix) Sing Tao Daily | 2021-11-19 | A14 | 港聞

倡優化研發環境
完善上游創新力

港大研珠三角企業多未用港高新科技

本報記者

港深兩地交往漸趨頻繁，但港大一項研究發現，內資企業主要使用珠三角和內地其他區域的服務和高新科技，很少使用香港的服務和技術，主要因為香港的成本較高、與內地市場的需求脫節、對內地商業模式的滲透不足，不了解香港的生產性服務和高新科技。研究團隊認為，珠三角在使用香港的高新科技、勞動力和生產性服務業上仍然存有障礙，建議讓珠三角高新科技企業更好了解香港的高新科技，包括推動珠三角高新科技企業在香港設立子公司。

香港大學跨學科研究團隊去年一月至今年五月，在深圳和東莞訪問三百六十三家生物醫藥和智能裝備的內資、港資和其他外資企業。研究發現這些香港擁有科技研究的優勢，珠三角在使用香港的高新科技、勞動力和生產性服務業上仍然存有障礙。

研究結果指，內資企業主要使用珠三角和內地其他區域的服務和高新科技，很少使用香港的服務和技術，主要因為香港的成本較高、與內地市場的需求脫節，對內地商業模式的滲透不足，不了解香港的生產性服務和高新科技等原因。

推動在港設子公司

研究又指，港資和其他外資企業仍會使用香港的服務和高新科技，但比重不高，主要是內地市場的快速壯大以及珠三角生產性服務和高科技產業迅速崛起，對香港的服務和科技構成競爭。研究團隊，香港在推動珠三角高新科技產業發展的重要性正在減退，但目前在市場拓展、國際化層面，企業融資和生產性服務業供給等仍擁有優勢。

團隊建議，讓珠三角高新科技企業更好了解香港的高新科技，包括推動珠三角高新科技企業在香港設立子公司，讓他們更大程度參與到香港本地的高新科技創新系統，團隊亦指，香港的高新科技創新系統尚待完善，包括研發力度不足和公共研發開支低，支持高新科技初創企業發展的體系尚待改善等，都是進一步技術轉移和商品化的瓶頸。香港需進一步優化研發環境，完善其上游創新能力，並建議政府提高研發經費的公共支出水平，以及多投入資源給香港研究資助局。

尋找香港與大灣區的新經濟合作模式

■港大研究團隊指，珠三角應用本港高新科技存障礙，倡優化研發環境。

團隊又指，香港需致力發展原始創新和本地的高新科技產業，並需善用其科技研發成果，發展本地的初創工業，避免完全依賴珠三角的工業，並建議透過不同的政策工具，加強對本地初創企業和高新科技工業的支援等。團隊亦建議利用新一代的信息及通訊科技，推動跨境和跨區域的粵港澳大灣區智慧區域的建設，及利用智慧科技為大灣區內地的企業和科研人員提供快速的網上電子商務簽證等。

(x) Hong Kong Economic Journal | 2021-11-19 | A15 | 創科鬥室 | StartupBeat 創科鬥室

灣區九成內企無採用港新科技

香港大學一個跨學科研究團隊，早前在珠三角開展高科技企業問卷調查和訪談，研究發現本港雖擁有科技研究的優勢，惟珠三角在使用香港創新高科技、勞動力及生產性服務業仍存在障礙；超過九成受訪內資企業坦言，從未用過香港研發的高新科技。

成本較高 不合市場需求

研究於去年1月至今年5月展開，在深圳及東莞訪問了363家生物醫藥及智能裝備企業，包括122間內資、117間港資及124間其他外資企業。研究發現，約八成內資企業主要使用珠三角及內地其他區域提供的服務和高新科技，很少使用香港的服務和技術，主因是成本較高、與內地市場需求脫節、對內地商業模式的滲透不足、不了解香港的生產性服務及高新科技等。

勞動力方面，近九成內資企業直言沒聘用香港人，除了因為勞動力成本高以外，主因是港人到珠三角就業的意願較低、以及對內地情況和市場不熟悉等。港大地理系講座教授林初昇提到，特區政府推出的「大灣區青年就業計劃」等，鼓勵香港年輕人到粵港澳大灣區城市工作，相關政策是好的開始，惟政府仍須想深一層、做得更廣。考慮到兩地稅制不同，港企在內地請人不易，他建議兩地政府加強溝通。

學者倡設商貿創科通道

近年珠三角的生產服務業快速崛起，加上內地強調「雙循環」經濟，形成龐大的內需市場。港大城市規劃與設計系講座教授葉嘉安指出，港企過往注重國際市場，要開拓內地市場屬一大挑戰，建議港企可在前海、廣州、東莞珠三角地區設立分公司，以「前台後室」方式提供服務；生產服務業的「大腦」則留在香港，以保留優勢。

葉嘉安補充，兩地文化的融合，配合需要時間及多方面的努力，在珠三角發展需要創新思維，建議特區政府為大灣區內資企業及科研人員提供快速的網上電子商務簽證，並在口岸設立像現有APEC（亞太經合組織）通道一樣的大灣區商貿創新科技通道。

（陳艷敏攝）

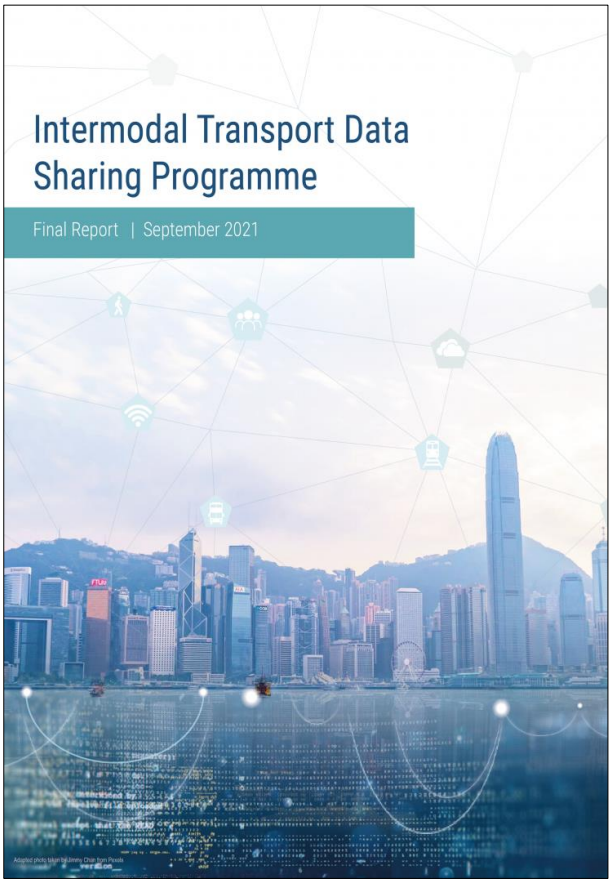
■林初昇（左二）認為「大灣區青年就業計劃」是個好開始，左三為葉嘉安。

5. Dr Jiangping Zhou

   - was featured in a HKU Press Release on 15 December 2021, with his contribution to a landmark smart city data project, assisted by Dr Weifeng Li and Dr Xingjian Liu.

     This project has paved the way for cities to solve complex transport problems and shown how passenger trip data can be successfully and securely shared between government and commercially sensitive private service providers.

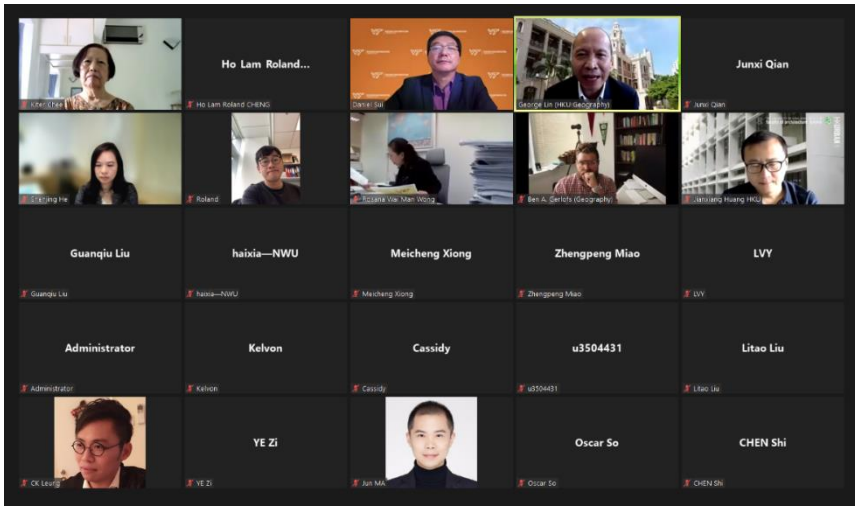
     HKU Press Release: https://www.hku.hk/press/news_detail_23739.html



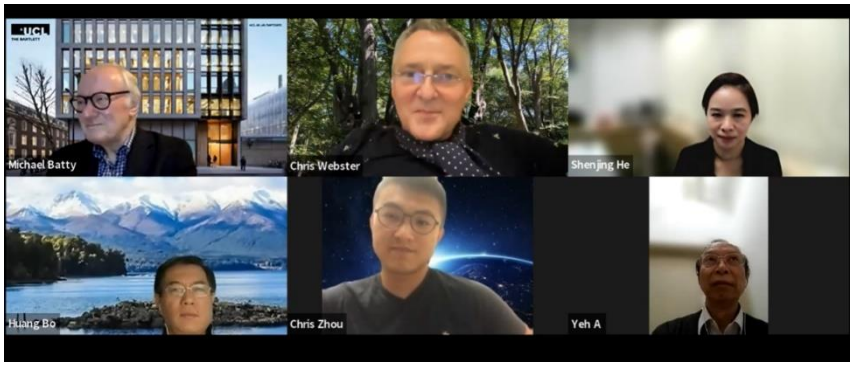
6. DUPAD/CUSUP 40th Anniversary Event Series

   - was launched in celebration of the establishment of the Centre of Urban Studies and Urban Planning (CUSUP) in 1980 and its subsequent development to become the Department of Urban Planning and Design (DUPAD) at the University of Hong Kong. The distinguished webinar series in Urban and Regional Research is sponsored jointly by DUPAD and the Department of Geography, HKU.

(i) Professor Daniel Sui, Vice President of Virginia Tech, delivered a webinar as part of this series via Zoom on 19 November 2021. The presentation topic was 'The Future of Cities in a Post-pandemic World: Exploring the Emerging Terra Incognita'. More than 200 participants joined the webinar.



(ii) Professor Michael Batty, Chairman of Centre for Advanced Spatial Analysis (CASA), University College London, delivered a webinar as part of this series via Zoom on 10 December 2021. The presentation topic was 'Digital Twins and Multiple Models: New Ways to Simulate and Invent the Future City'. More than 200 participants joined the webinar.



(iii) An alumni sharing session by Mr Ivan Chung Man-kit, JP, Director of Planning of the HKSAR Government, was delivered via Zoom on 9 December 2021. Mr Chung graduated from HKU's Master of Science in Urban Planning Programme in 1989. The presentation topic was 'Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030'. Around 200 participants joined the sharing session.

(iv) An alumni sharing session by Ms Theresa Yeung, Director of Arup, was delivered via Zoom on 16 December 2021. Ms Yeung graduated from HKU's Master of Science in Urban Planning Programme in 1996. The presentation topic was 'Planning in Capturing the Greater Bay Area Opportunities'. Around 50 participants joined the sharing session.

Centre of Urban Studies and Urban Planning

1. Dr Derrick Ho

   - has published the following articles:

   (i) GBD 2019 Adolescent Mortality Collaborators. (2021). Global, regional, and national mortality among young people aged 10–24 years, 1950–2019: a systematic analysis for the Global Burden of Disease Study 2019, *The Lancet, 398*(10311), 1593-1618. DOI: https://doi.org/10.1016/S0140-6736(21)01546-4

   Background: *Documentation of patterns and long-term trends in mortality in young people, which reflect huge changes in demographic and social determinants of adolescent health, enables identification of global investment priorities for this age group. We aimed to analyse data on the number of deaths, years of life lost, and mortality rates by sex and age group in people aged 10–24 years in 204 countries and territories from 1950 to 2019 by use of estimates from the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2019.*

   Methods: *We report trends in estimated total numbers of deaths and mortality rate per 100 000 population in young people aged 10–24 years by age group (10–14 years, 15–19 years, and 20–24 years) and sex in 204 countries and territories between 1950 and 2019 for all causes, and between 1980 and 2019 by cause of death. We analyse variation in outcomes by region, age group, and sex, and compare annual rate of change in mortality in young people aged 10–24 years with that in children aged 0–9 years from 1990 to 2019. We then analyse the association between mortality in people aged 10–24 years and socioeconomic development using the GBD Socio-demographic Index (SDI), a composite measure based on average national educational attainment in people older than 15 years, total fertility rate in people younger than 25 years, and income per capita. We assess the association between SDI and all-cause mortality in 2019, and analyse the ratio of observed to expected mortality by SDI using the most recent available data release (2017).*

   Findings: *In 2019 there were 1·49 million deaths (95% uncertainty interval 1·39–1·59) worldwide in people aged 10–24 years, of which 61% occurred in males. 32·7% of all adolescent deaths were due to transport injuries, unintentional injuries, or interpersonal violence and conflict; 32·1% were due to communicable, nutritional, or maternal causes; 27·0% were due to non-communicable diseases; and 8·2% were due to self-harm. Since 1950, deaths in this age group decreased by 30·0% in females and 15·3% in males, and sex-based differences in mortality rate have widened in most regions of the world. Geographical variation has also increased, particularly in people aged 10–14 years. Since 1980, communicable and maternal causes of death have decreased sharply as a proportion of total deaths in most GBD super-regions, but remain*

some of the most common causes in sub-Saharan Africa and south Asia, where more than half of all adolescent deaths occur. Annual percentage decrease in all-cause mortality rate since 1990 in adolescents aged 15–19 years was 1·3% in males and 1·6% in females, almost half that of males aged 1–4 years (2·4%), and around a third less than in females aged 1–4 years (2·5%). The proportion of global deaths in people aged 0–24 years that occurred in people aged 10–24 years more than doubled between 1950 and 2019, from 9·5% to 21·6%.

Interpretation: *Variation in adolescent mortality between countries and by sex is widening, driven by poor progress in reducing deaths in males and older adolescents. Improving global adolescent mortality will require action to address the specific vulnerabilities of this age group, which are being overlooked. Furthermore, indirect effects of the COVID-19 pandemic are likely to jeopardise efforts to improve health outcomes including mortality in young people aged 10–24 years. There is an urgent need to respond to the changing global burden of adolescent mortality, address inequities where they occur, and improve the availability and quality of primary mortality data in this age group.*

(ii) Xu, Z., Tong, S., **Ho, H. C.**, Lin, H., Pan, H., & Cheng, J. (2021). Associations of heat and cold with hospitalizations and post-discharge deaths due to acute myocardial infarction: what is the role of pre-existing diabetes? *International Journal of Epidemiology*. Advance online publication. DOI: https://doi.org/10.1093/ije/dyab155

Background: *The existing evidence suggests that pre-existing diabetes may modify the association between heat and hospitalizations for acute myocardial infarction (AMI).*

Methods: *This study included patients who were hospitalized for AMI from 1 January 2005 to 31 December 2013 in Brisbane, Australia, and also included those who died within 2 months after discharge. A time-stratified case-crossover design with conditional logistic regression was used to quantify the associations of heat and cold with hospitalizations and post-discharge deaths due to AMI in patients with and without pre-existing diabetes. Stratified analyses were conducted to explore whether age, sex and suburb-level green space and suburb-level socio-economic status modified the temperature-AMI relationship. Heat and cold were defined as the temperature above/below which the odds of hospitalizations/deaths due to AMI started to increase significantly.*

Results: *There were 14 991 hospitalizations for AMI and 1811 died from AMI within 2 months after discharge during the study period. Significant association between heat and hospitalizations for AMI was observed only in those with pre-existing diabetes (odds ratio: 1.19, 95% confidence interval: 1.00-1.41) [heat (26.3°C) vs minimum morbidity temperature (22.2°C)]. Cold was associated with increased odds of hospitalizations for AMI in both diabetes and non-diabetes groups.*

Significant association between cold and post-discharge deaths from AMI was observed in both diabetes and non-diabetes groups.

Conclusions: *Individuals with diabetes are more susceptible to hospitalizations due to AMI caused by heat and cold.*

2. Dr Weifeng Li and Dr Derrick Ho

   - have published the following article with Huagui Guo (PhD student):

   Guo, H., **Li, W.**, Wu, J., & **Ho, H. C.** (2021). Does air pollution contribute to urban–rural disparity in male lung cancer diseases in China? *Environmental Science and Pollution Research*. Advance online publication. DOI: https://doi.org/10.1007/s11356-021-17406-5

   Abstract*: It remains unknown whether exposure to ambient air pollution can be a mediator linking socioeconomic indicator to health outcome. The present study aims to examine the mediation effect of PM2.5 air pollution on the association between urban–rural division and the incidence (mortality) rate of male lung cancer. We performed a nationwide analysis in 353 counties (districts) of China between 2006 and 2015. A structural equation model was developed to determine the mediation effect of exposure to PM2.5. We also tested whether the findings of the mediation effect of exposure to PM2.5 are sensitive to the controls of smoking factors and additional air pollutant, and PM2.5 exposures with different lag structures. According to the results, we found that exposure to PM2.5 significantly mediated the association between urban–rural division and the incidence rate of male lung cancer. Specifically, there were significant associations between urban–rural division, exposure to PM2.5, and the incidence rate of male lung cancer, with PM2.5 exposure accounting for 29.80% of total urban–rural difference in incidence rates of male lung cancer. A similar pattern of results was observed for the mortality rate of male lung cancer. That is, there was a significant mediation effect by PM2.5 on the association of the mortality rate with urban–rural division. The findings of exposure to PM2.5 as a mediator were robust in the three sensitivity analyses. In conclusion, urban–rural difference in exposures to PM2.5 may be a potential factor that contributes to urban–rural disparity in male lung cancer diseases in China. The findings inform that air pollution management and control may be effective measures to alleviate the great difference in male lung cancer diseases between urban and rural areas in China.*

3. Dr Jiangping Zhou

   - has published the following paper with PhD students Jiangyue Wu and Hanxi Ma:

     Wu, J., **Zhou, J.**, & **Ma, H.** (2021). Revisiting the valuable locales in our cities? Visualizing social interaction potential around metro station areas in Wuhan, China. *Environment and Planning A: Economy and Space*. Advance online publication. DOI: https://doi.org/10.1177/0308518X211062227

     ***Abstract**: A complete tour of metro users consists of their journeys inside the carriage and various activities outside the carriage, in particular, those in or around metro station areas (MSAs). To fathom out the spatiality and magnitude of those activities, which involve substantial interactions among people or with urban spaces, we assume that (a) metro users who spent 30 min or more together in or around the same MSA would physically interact with at least another person there; (b) the more an MSA sees metro riders co-presenting there the higher social interaction potential (SIP) there is; (c) SIP of an MSA is positively correlated with the number of distinct riders co-presenting in that MSA. By exploiting two-day metro smartcard data of Wuhan, China, we use the number of distinct riders co-presenting in that MSA to measure and visualize the MSA-level SIP in that city. Our visuals show the SIP varies across MSA and time of the day. Some MSAs have higher SIP in the daytime whereas other MSAs have higher SIP at the nighttime. Few MSAs continuously have high SIP. These results inform us where and when SIP would be the highest and the lowest across MSAs, which can facilitate metro operators' monitoring and management of MSAs on the one hand and help businessmen and officials decide where and when to provide services and/or sell products across MSAs.*

4. Mr Alain Chiaradia

   was invited to serve as Chief Judge at the hackathon '*FastTrack* CityHack Hong Kong' on 3-5 December 2021. DUPAD lecturer Mr Siddharth Khakhar also served as one of the mentors.

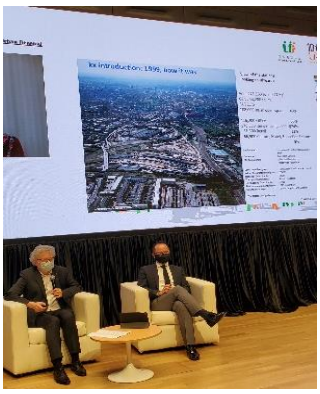
   The event was organised by AECOM as part of the '*FastTrack* CityHack' worldwide series. Three Hong Kong grand challenges were set up, namely: Resilience, Carbon-Zero, and Digital Eco-system. More information: https://cityhack.aecom.com/FastTrackCityHackHK/

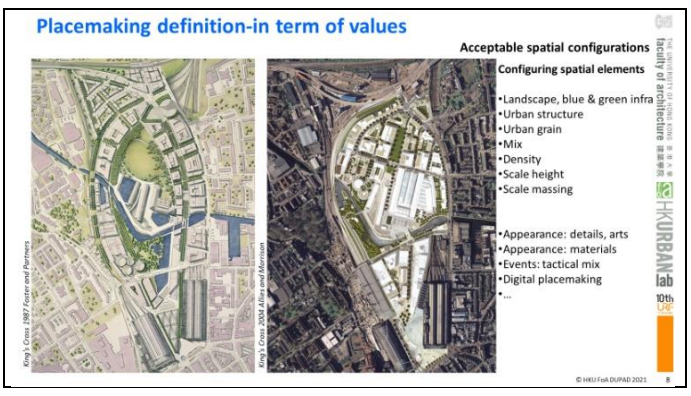
5. Professor Rebecca L. H. Chiu and Mr Alain Chiaradia

- Professor Rebecca Chiu was organising committee member and moderator of the 10th Anniversary Conference of Urban Renewal Fund, of which she is a Director. The Conference, with the theme of 'Envisioning Good Practices for Socio-Cultural Sustainability', was held on 10 December 2021 at JC Cube, Tai Kwun.

  Mr Alain Chiaradia was invited to speak at its Plenary Session I: Overseas Experience in Good Practices for Socio-Cultural Sustainability in Urban Renewal, on 'Creating and Managing Values in Common by Placemaking'.

  The presentation applied a value framework to explore how the development form of King Cross used by the developer could be understood as values in common for placemaking. The elaboration of the masterplan had received criticism and support while a wide-ranging agenda of events targeting the immediate neighbourhood and beyond delivered a successful community-driven placemaking programme in London. An overview of incremental development in Quarry Bay, Hong Kong concluded the presentation.





6. Professor Rebecca L. H. Chiu

- Upon the invitation of the Hong Kong Housing Society, which is well known as a housing laboratory, Professor Chiu organised a visit by the professoriate staff of FoA and their research partners to the Society's mock-up flat prototypes exhibition. A total of 15 researchers from FoA (including Mr Alain Chiaradia, Professor Rebecca Chiu, Professor Shenjing He, Dr Mandy Lau and Mr Kasemsit Yimparsit from DUPAD), Department of Orthopedics and Traumatology, Centre on Ageing and Department of Mechanical Engineering, and four medical professionals from MacLehose Medical Rehabilitation Centre (MMRC) joined the tours on 22 and 25 November 2021.

  The purpose of the visit was to help review the design prototypes aiming to facilitate the liveability of disabled and wheelchair users in a home environment. Participants were briefed the adaptability and universal design concepts, as well as technologies, building materials and a design typology befitting different flat sizes and residents of different ages and mobility problems. Participants provided comments and advice during and after the tour.

  The visit also benefitted the participants, some of whom are involved in a proposed study on the enhancement of MMRC with smart technology, a collaborative research by FoA, Department of Orthopedics and Traumatology, and Department of Mechanical Engineering.

Healthy High Density Cities Lab

1. Dr Chinmoy Sarkar, Ms Kai-yan Yvonne Lai, Dr Michael Ni, Sarika Kumar, Dean Gabriel Leung, and Dean Webster

    - Their paper has been selected as one of the three featured papers in the November publication list of the School of Public Health:

      Sarkar, C., Lai, K. Y., Ni, M. Y., Kumari, S., Leung, G. M., & Webster, C. (2021). Liveable residential space, residential density, and hypertension in Hong Kong: A population-based cohort study. *PLOS Medicine, 18*(11): e1003824. DOI: https://doi.org/10.1371/journal.pmed.1003824

      Background: *Hypertension is a leading preventable risk factor of chronic disease and all-cause mortality. Housing is a fundamental social determinant of health. Yet, little is known about the impacts of liveable residential space and density on hypertension.*

      Methods and findings: *This retrospective observational study (median follow-up of 2.2 years) leveraged the FAMILY Cohort, a large territory-wide cohort in Hong Kong, Special Administrative Region, People's Republic of China to quantify associations of objectively measured liveable space and residential density with blood pressure outcomes among adults aged ≥16 years. Blood pressure outcomes comprised diastolic blood pressure (DBP), systolic blood pressure (SBP), mean arterial pressure (MAP), and hypertension. Liveable space was measured as residential floor area, and density was assessed using the number of residential units per building block and neighborhood residential unit density within predefined catchments. Multivariable regression models examined associations of liveable floor area and residential density with prevalent and incident hypertension. We investigated effect modifications by age, sex, income, employment status, and housing type. Propensity score matching was further employed to match a subset of participants who moved to smaller residences at follow-up with equivalent controls who did not move, and generalized linear models examined the impact of moving to smaller residences upon blood pressure outcomes. Our fully adjusted models of prevalent hypertension outcomes comprised 30,439 participants at baseline, while 13,895 participants were available for incident models at follow-up. We found that each interquartile range (IQR) increment in liveable floor area was associated with lower DBP (beta [β] = −0.269 mm Hg, 95% confidence interval [CI]: −0.419 to −0.118, p < 0.001), SBP (β = −0.317 mm Hg, −0.551 to −0.084, p = 0.008), MAP (β = −0.285 mm Hg, −0.451 to −0.119 with p < 0.001), and prevalent hypertension (odds ratio [OR] = 0.955, 0.918 to 0.993, p = 0.022) at baseline. Each IQR increment in residential units per building block was associated with higher DBP (β = 0.477 mm Hg, 0.212 to 0.742, p = <0.001), SBP (β = 0.750 mm Hg, 0.322 to 1.177, p = <0.001), MAP (β = 0.568 mm Hg,*

0.269 to 0.866, p < 0.001), and prevalent hypertension (OR = 1.091, 1.024 to 1.162, p = 0.007). Each IQR increase in neighborhood residential density within 0.5-mi street catchment was associated with lower DBP (β = −0.289 mm Hg, −0.441 to −0.137, p = <0.001), SBP (β = −0.411 mm Hg, −0.655 to −0.168, p < 0.001), MAP (β = −0.330 mm Hg, −0.501 to −0.159, p = <0.001), and lower prevalent hypertension (OR = 0.933, 0.899 to 0.969, p < 0.001). In the longitudinal analyses, each IQR increment in liveable floor area was associated with lower DBP (β = −0.237 mm Hg, −0.431 to −0.043, p = 0.016), MAP (β = −0.244 mm Hg, −0.444 to −0.043, p = 0.017), and incident hypertension (adjusted OR = 0.909, 0.836 to 0.988, p = 0.025). The inverse associations between larger liveable area and blood pressure outcomes were more pronounced among women and those residing in public housing. In the propensity-matched analysis, participants moving to residences of lower liveable floor area were associated with higher odds of incident hypertension in reference to those who did not move (OR = 1.623, 1.173 to 2.199, p = 0.002). The major limitations of the study are unmeasured residual confounding and loss to follow-up.

Conclusions: *We disentangled the association of micro-, meso-, and macrolevel residential densities with hypertension and found that higher liveable floor area and neighborhood scale residential density were associated with lower odds of hypertension. These findings suggest adequate housing in the form of provisioning of sufficient liveable space and optimizing residential density at the building block, and neighborhood levels should be investigated as a potential population-wide preventive strategy for lowering hypertension and associated chronic diseases.*

Ronald Coase Centre for Property Rights Research

1. Dr Chongyu Wang (Michael)

   - has published the following paper:

     Feng, Z., Hardin, W. G., & **Wang, C.** (2021). Rewarding a Long-Term Investment Strategy: REITs. Journal of Real Estate Research. Advance online publication. DOI: https://doi.org/10.1080/08965803.2021.2001896

     ***Abstract**: The initial structure of real estate investment trusts (REITs) was predicated on real estate as a long-hold asset that would benefit from an ownership structure that fosters property portfolios held and managed for the long-term. Using a sample of publicly traded U.S. REITs from 1995 to 2018, we find that REIT performance is positively associated with previous-year property holding period. The results support the original broad policy goals associated with the REIT structure to allow for broad ownership of commercial real estate assets held for the long-term. The results further show that REITs adopting long-term investment and management strategies suggested by the enabling laws allowing the REIT structure are more profitable with better shareholder returns. The benefits related to portfolio construction and management shown in this study are complementary to studies related to property location and other portfolio construction strategies. Our findings are attributed to enhanced operational efficiency, property-level cash flow, and managerial effort.*

Social Infrastructure for Equity and Wellbeing

1. Professor Shenjing He, Dr Xiang Yan and Dean Webster

   - have published the following paper:

   Yan, X., **He, S.**, **Webster, C.**, & Yu, M. (2022). Divergent distributions of physicians and healthcare beds in China: Changing patterns, driving forces, and policy implications, *Applied Geography, 138*, 102626, ISSN 0143-6228. DOI: https://doi.org/10.1016/j.apgeog.2021.102626

   ***Abstract**: The distributions of different healthcare resources are typically examined individually and separately, thus overlooking the fundamental fact that healthcare delivery hinges on the cofunction of different resources. Divergent distributions of physicians and healthcare beds are found to significantly affect healthcare quality and efficiency, while theoretical understanding and related empirical investigations are still lacking. This study disserts the divergent distributions as embedded in medicine (i.e., physician-to-bed ratio varies for the treatment of different diseases) and shaped largely by the healthcare delivery system that determines where different diseases to be treated. Gini coefficients and bivariate Moran's Index provide strong evidence for the increasing divergence in their distributions across prefecture-level cities in China between 2000 and 2018. Spatial regression models reveal a high physician-to-bed ratio in cities of a higher level, with high finance capacity, few primary care facilities, and advanced medical technologies. Meanwhile, less developed areas are multidimensionally disadvantaged in attracting physicians, as political, economic, and medical technological forces acted jointly to determine healthcare resource distribution. This study presents a novel approach to healthcare resource distribution by focusing on the colocation of different resources, and suggests that more comprehensive policymaking is required to coordinate and optimize healthcare resource allocation across the country.*

   Keywords: Healthcare resource; Physician; Healthcare bed; Healthcare reform; Spatial regression model

2. Professor Shenjing He

   - has published the following papers:

   (i) Hao, P., & **He, S**. (2022). What is holding farmers back? Endowments and mobility choice of rural citizens in China. *Journal of Rural Studies, 89*, 66-72. DOI: https://doi.org/10.1016/j.jrurstud.2021.11.014

   ***Abstract**: For the roughly 300 million rural migrant workers in China, migrating to urban destinations offers the primary opportunities for*

poverty alleviation and upward social mobility. However, studies on migration in China, mostly through the lens of the push-pull theory, have left immobile rural residents unexamined. This paper explores how the mobility choices of rural citizens are determined by individual and familial endowments at the sending end, including their physical wellbeing, basic education, family livelihoods and landholdings. Drawing on the China Household Finance Survey data, our analyses suggest that good health, adequate educational attainment and non-local family livelihoods increase the propensities of out-migration while a lack of these endowments likely bars rural citizens from migration. The possession of rural land and other local resources, in contrast, tends to deter migration to urban destinations. The requisition of rural land, however, encourages migration to a local town while deterring longer-distance migration. These findings add to the literature of migration in China by unraveling the sorting mechanism of endowments that shapes the (im)mobility and divergent life outcomes of China's rural population.

(ii) Wang, K., Qian, J., & **He, S**. (2021). Global destruction networks and hybrid e-waste economies: Practices and embeddedness in Guiyu, China. *Environment and Planning A: Economy and Space*. Advance online publication: DOI: https://doi.org/10.1177/0308518X211061748

***Abstract**: Recent geographical scholarship on the illicit e-waste geographies and e-waste processing hubs in the Global South has shed light on the global mobilities, production/destruction networks, and political economy/ecology of e-waste. However, their views about the reactivation of value in waste and the dialectics between waste and value rest predominantly on networks of material linkages shaped by broader political-economic structures at macro scales, but are relatively reticent about how mobilities and networks are coordinated by specific places, and how economic practices conducted by a broad diversity of local actors, often informal, constitute economic relations, transactions and dependencies, mediated by place-sticky social and cultural fabrics and vernacular institutions. Based on a study of Guiyu town in Guangdong Province, China, an (in)famous hub of global e-waste recycling, this study unpacks its cluster evolution through a perspective that works with the concept of embeddedness but by way of an emphasis on practice. By tracing a multiplicity of territorial, sociocultural, and political dynamics that articulate between the local and the global, this study enriches existing scholarships on e-waste geographies, global production/destruction networks, and the economic geographies of the illicit.*

(iii) Wang, L., **He, S.**, Zhao, C., Su, S., Weng, M., & Li, G. (2022). Unraveling urban food availability dynamics and associated social inequalities: Towards a sustainable food environment in a developing context. *Sustainable Cities and Society, 77*, 103591. DOI: https://doi.org/10.1016/j.scs.2021.103591

***Abstract**: The essential role of food environment in achieving urban sustainability has been widely recognized worldwide. A myriad of studies has emphasized food availability as the basic starting point for a comprehensive understanding of urban food environment. However, most of the empirical evidences were based on Western cases, and how urban food availability and associated social inequalities change over time remains poorly understood for the developing world. This paper first establishes a conceptual framework which illustrates a ternary perception of urban food availability and explains why accessibility, diversity and locational association should be considered as a whole package. Guided by the framework, a set of indicators are developed and further applied to capture the food availability dynamics from 2016 to 2018 within Hangzhou metropolitan in China. Last, multilevel regression is applied to unpack the social inequalities in food availability over time. Results show that overall temporal changes of food availability are not obvious but the spatial heterogeneity is prominent and lasting. Particularly, food environment is rather more complex in the central area but is much healthier compared with the outskirts. Significant social equalities in food availability persist but present a declining trend within the research period. More specifically, food availability is subjected to socioeconomic status (SES) at both community level and sub-district level. Such results go beyond prior findings through highlighting a nested effect of multilevel neighborhood SES on urban food availability. Several possible avenues for creating sustainable food environment within metropolitan areas in a developing context are discussed based on the main findings. The discovered urban food availability dynamics and associated social inequalities differ a lot with those reported in Western cities. This paper is thus believed to throw fresh light on urban sustainable food environment research in non-western context.*

- was invited to give a keynote speech entitled 'Social Infrastructure for Equity and Wellbeing: Exploring Interdisciplinary Research Approaches' at the China Conference on Geography 2021, hosted by Fuzhou Normal University in hybrid mode, on 13 December 2021.

Organised every four years, the Conference is recognised as one of the most important academic events for Chinese geographers. The 2021 Conference has attracted over 160,000 online participants.

Urban Analytics and Interventions Research Lab

1. Ms Jianting Zhao (PhD student)

    - presented at the 61st ACSP Annual Conference on 23 October 2021, on her research ‘Street Experiment Place-making in an Asian High-density City: Why Positive Feedback does not Promise Long-term Changes?’.

    - presented at the HKU/PKU-SZ Joint Doctoral Colloquium on Smart Cities Analytics on 28 November 2021, on her research ‘Street Experiment: Urban Planning Niches Through Tactical Urbanism’.

2. Dr Guibo Sun

    - presented at the 61st ACSP Annual Conference on 23 October 2021, on his work ‘The Making of Volumetric Hong Kong: Three-dimensional Pedestrian Network as the Critical Walking Infrastructure’.

3. Ms Yao Du (PhD student)

    - presented at the APRU Global Health Conference on 18 November 2021, on her research ‘The Disparities in Active Travel and Public Transport Use for the Older People During the COVID-19 Pandemic: Metro and Health Cohort Study in Hong Kong’.

4. Dr Eun Yeong Choe

    - presented at the APRU Global Health Conference on 18 November 2021, on her research ‘The Role of Natural Environments in the Effectiveness of a Mindfulness-based Stress Reduction (MBSR) Programme: Psychological and Physiological Responses to Stress’.

    - was invited to give a talk at the International Garden Symposium 2021, Korea, titled ‘The Health Benefits of Green Care Interventions Focusing on the Use of Green Spaces to Improve Public Health and Wellbeing’. The talk has been recorded and can be accessed online, at: https://www.youtube.com/watch?v=MDlHaNVx3jw&t=13s

- has published the following paper:

  Choe, E. Y., Jorgensen, A., & Sheffield, D. (2021). Examining the effectiveness of mindfulness practice in simulated and actual natural environments: Secondary data analysis. *Urban Forestry & Urban Greening, 66*, 127414. DOI: https://doi.org/10.1016/j.ufug.2021.127414

  ***Abstract**: This study compared mindfulness practice outcomes retrieved from the authors' earlier studies in simulated and actual natural environments. We found that both simulated and actual natural environments boosted these outcomes. However, the actual natural environment was associated with larger decreases in stress and greater increases in nature connectedness than the simulated natural environment. The findings evidence the potential value of simulated as well as actual natural environments as settings for the enhancement of the delivery of health care and complementary therapeutic programmes. Whilst actual natural environments are most effective, the development and use of simulated natural environments may support groups who would for mobility or other reasons have difficulty in accessing a natural environment.*

5. Mr Dongsheng He (PhD student)

   - has published the following papers:

   (i) Yang, H., Zhang, Q., Helbich, M., Lu, Y., **He, D.**, Ettema, D., & Chen, L. (2022). Examining non-linear associations between built environments around workplace and adults' walking behaviour in Shanghai, China. *Transportation Research Part A: Policy and Practice, 155*, 234-246. DOI: https://doi.org/10.1016/j.tra.2021.11.017

   ***Abstract:** Using gradient boosting decision trees, our results showed that the built environment around workplaces is crucial for higher levels of walking behaviors, but built environment features tended to have distinctive associations with different domains of walking behaviors. Specifically, the number of physical activity facilities was positively associated with all three domains of walking behaviors, while a high floor area ratio was negatively associated with different domains of walking behaviors to some extent. Furthermore, several built environment characteristics, such as land use entropy, street view greenery, distance from home to the city center, and distance between the city center and workplaces had distinctive associations with different domains of walking behaviors.*

   (ii) **He, D.**, Lu, Y., Xie, B., & Helbich, M. (2021). Large-scale greenway intervention promotes walking behaviors: A natural experiment in China. *Transportation Research Part D: Transport and Environment, 101*, 103095. DOI: https://doi.org/10.1016/j.trd.2021.103095

Abstract: *The results of the mixed-effect difference-in-difference (DID) models showed that the greenway intervention had a significantly positive effect on the walking time, especially for residents living within two kilometers from the greenway. Furthermore, women and socio-economically disadvantaged people benefited most from the greenway implementation regarding walking time. Our findings provided compelling evidence that public investment in transportation infrastructure (e.g., greenway) effectively promotes walking behaviors and mitigates social inequities in physical activity.*