When does it make sense to stop designing?

At a very nice dinner recently, on the occasion of a cordial visit from the Hong Kong Institute of Architects and Architects Registration Board, I had a fascinating conversation about the marginal returns to additional hours of design. Sounds prosaic, but it's actually quite important.

Why do we teach our design students to work right up to the wire? Because that's how they will have to work in an office after graduation. But why do offices work like this? Many other professions also work to brutal external deadlines but find it possible to organise a work-flow with efficient and humane internal deadlines. Do all architects work like this in the real world?

Apparently not. Among the four practicing architects sharing my table at the dinner, all agreed heartily that one kind of architect is particularly good at resisting pressure to work on and on until the final hour. Mothers. For obvious reasons, female architects with young children are by far the most efficient colleagues in an architectural practice I was told. They are more resistant to demands for last minute changes and that probably makes them work in a way that means they can more strongly argue that working the evening shift will add no marginally appreciable benefit.

That's when we got on to marginal gains and marginal costs. Or if you like math: the derivative of net gains with respect to time input. At what point does the net gain curve peak? I threw in the example of the mother of my own children – but in a way that worked against the architects' experience in their offices. My wife, for many years, was the lead clinical physiotherapist for stroke rehabilitation in the South Wales region of the UK. Such a consummate professional was she in that role, that like Professor Weijen Wang, who was one of those dining with me, she would pursue her professional input to perfection. For Weijen, working to the wire means being able to make as many fine adjustments as possible to a design before a deadline. For my wife, it meant offering therapy for even miniscule gains in rehabilitation. If someone can make even small

improvements in regaining their muscle control for walking, then she would work with them.

At that point in the discussion, some of the architects – those with big offices to run – picked up the theme I was curious about: when do you stop? My wife was once co-investigator on a research project with the Welsh School of Medicine, which was geared towards designing an optimal community follow-up service for stroke patients after discharge from hospitalisation. Against her professional Hippocratic conscience, she was forced to confront the fact that the more effort you add to a rehabilitation programme for a stroke sufferer, the less the marginal improvements. At some stage, the gains are imperceptible. Given the opportunity cost of a physical therapist's time, when does it make sense to stop? When does it make sense to stop designing?

In our studios, we by and large act as if the answer to this is 'never', or 'a long way beyond the maximum time available'. And thus we train students to work up to the wire. In the office, however, office managers have real opportunity costs and make decisions to pull someone from one project to work on another. In this environment, it would seem to be a matter of good professional judgement and personal skill, to be able to evaluate, albeit intuitively, the diminishing returns to time as you add more hours to a design.

At this point in the conversation, I asked the two FoA colleagues at the table: 'where and how do we teach our architectural students when to put the pencil down?'. One answer is that we train our students to become the best designers. Their studio experiences must give them scope to aim towards perfection. Every additional hour counts. At one level I agree with this. But where I think I side with the full time professional architects, is that this freedom could be used to help students learn valuable lessons not only in time management but in the conceptualisation of design and the design process.

Here's one theory of the design process. It describes well all design work I have ever engaged with personally. You design at one level, stand back and take stock, then move on and design at another level. 'Levels' may be levels of abstraction, levels of detail, floor levels, spatial or time sequence, and so on. This is formalised in the work flow of a design office, with juniors doing detailing designs. Design is a fractal-like process. You think you've finished and then you move to a more detailed scale and have to make another set of design decisions. In nature, fractal geometry often opens up new worlds of structure *ad infinitum*. In an urban or building design context, this is not so: there are a finite number of design levels, perhaps stopping at interior design – at the furniture level.

So let me phrase my question another way: how do we train students to develop their own individual decision process that is able to self-monitor the different levels of design that a problem should be broken down into? I presume that we do, in fact, teach our students to phase their designing by appropriate levels of spatial detail. This suggests that at each stage, we are teaching them the skill of understanding when they are coming to the end of one stage and should be starting the next. It may be, however, that phasing of work in studios is routinely

managed by imposed deadlines, imitating professional external deadlines. I wonder, however, if that is the best answer or pedagogical approach. A science or social science student learns to apportion time in a project to researching the problem, designing the experiment, setting it up, implementing it, recording results, writing up and discussing. If the experiment does not work according to plan, it has to be written up as a failure or modified within the time alloted. A surgeon works with a theatre slot. But the phasing and management of each step in an operation is designed by professional judgement. If there is no time for a text-book cut, then so be it. If there is no time for the most cosmetically perfect recreation of a broken bone and tissue or sewn-up scar, then judgement will cut the process short.

But perhaps I have challenged my own argument: surgeons work up to the wire and no doubt generally aim to deliver as perfect an operation as is possible given the constraints. The senior architectural practice managers at my dinner were in agreement on one thing: learning when to stop designing is a skill that makes someone a better practicing architect.

This brings me back to a related issue discussed in previous Dean's Roundups: designing with or without constraints. Designing without constraints is arguably not designing at all. It might better be described as play, or a form of art, or self-expression, or even narcissism. Actually, 'designing' without constraints is very difficult. Perhaps it is impossible. Perhaps 'unconstrained design' is an oxymoron. Fine art painting without the constraints of representational forms, gave us Abstract Expressionism – arguably not the world's favourite art genre, probably due to its self-indulgence. Painting *with* the constraints of representational forms but without the constraints of physics, biology, morality and other forces that govern the real world, gave us Surrealism – still self-indulgent, less alienating in that it gives the viewer readable motifs, but more alienating for some if the painter seeks to offend, as was the wont of some surrealists in their mid 20th century heyday.

Though the best architects are great artists, a design is a way of solving a problem, or allocating resources. A few of us this morning were sitting around a table speculating on designs for HKU's new campus in Shenzhen. We had a finite empty site to fill with a finite number of students for a finite budget. Design adds value by solving problems efficiently and elegantly. Its costs tend to increase linearly with quantity, but in the end, the additional value it adds must eventually fall. Some products, like the early Toyota cars exported to the West, are over-designed. Is it possible that a building can be over-designed such that the maximum value added by design was some iterations before the designer finished with the drawings?

Should not *judging when to stop*, rather than *being stopped*, be just an extension of the discipline of design?

Many congratulations to all those mentioned below.

Chris
Dean, FoA

Faculty of Architecture

1. Welcome to Dr Jones Emma Letizia, who joined us as Assistant Professor with the Department of Architecture in September 2021.

2. HKU Scholars in the Top 1%

   - The following members of the Faculty have been ranked by Clarivate Analytics in the top 1% worldwide by citations in at least one of the 22 research fields:

     Professor Shenjing He, DUPAD
     Dr Xingjian Liu, DUPAD
     Professor Wilson Lu, REC
     Professor Chris Webster, FoA
   Professor Anthony Yeh, DUPAD

     The data is drawn from Essential Science Indicators (ESI). For its methodology, please visit their webpage.

     Data source: Essential Science Indicators, updated as of 9 July 2021 to cover a 10-year plus 4-month period, from 1 January 2011 to 30 April 2021.

Department of Architecture

1. 'Kinetic Grid Structure' Exhibition

- was curated by Dr Eike Schling and his research team, showcasing the experimentation and implementation of a modern, advanced spatial mechanism using glass fiber lamellas and methods of computation. Despite the pandemic, the project continues in Hong Kong and Munich, and highlights of the ongoing work at HKU and TUM were reproduced at the HKU Architecture Gallery for public view.
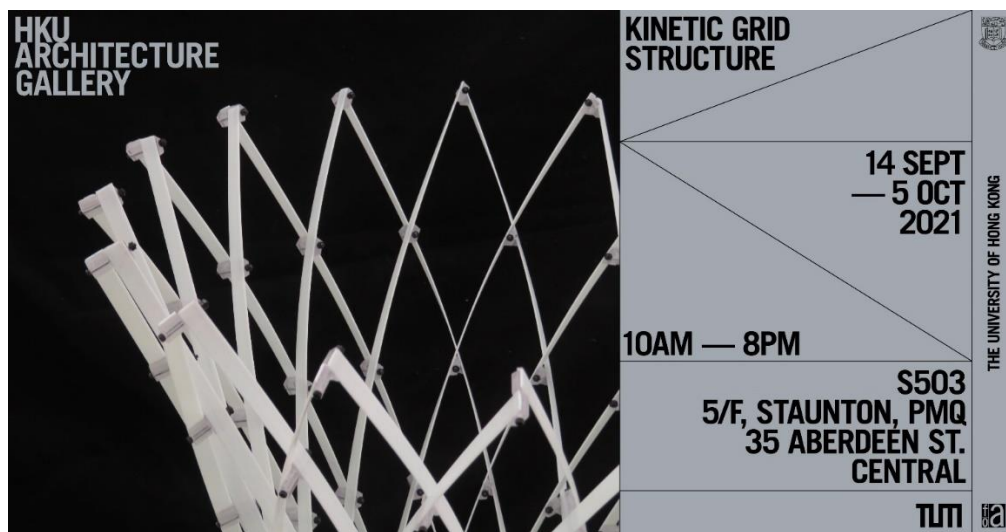
Advances in architectural geometry and mechanical simulation have revealed a new kind of spatial mechanism that can be constructed from straight elastic lamellas connected through scissor joints. These lamella grids can be easily manufactured and offer a controlled movement from a flat shape into a doubly curved shape, with the potential to inform the design of transformable structures at all scales, ranging from foldable roofs and adaptive building facades to medical stents for heart surgery.

The project team uses computational tools to design a grid along so-called asymptotic curves on surfaces with negative Gaussian curvature, and then adjusts its kinetic behaviour by controlling the element stiffness, joint rotation and support conditions. Through physical prototypes, the team investigates various design possibilities and actuation techniques. The Kinetic Umbrella, the first large-scale architectural application, has recently been completed in Munich. It is a transformable structure built from glass fiber lamellas, which can change its shape from a vertical cylinder into a wide cantilevering funnel-shaped roof.

This interactive exhibition introduced the research through experimental models and simulations, while showing full-scale documentation of the Kinetic Umbrella.

Exhibition Curator: Dr Eike Schling

Research Team: Jan Yip Choy, Jacky Chu, Hao Feng Chuah, Ka Mak Fan, Hing Fung Li, Muye Ma, Zongshuai Wan

Academic Partner:

Jonas Schikore (Project Lead: Kinetic Umbrella)

Pierluigi D'Acunto, Professor for Structural Design

Faculty of Architecture, Technical University of Munich

Date:	**14 September 2021 (Tuesday) – 5 October 2021 (Tuesday)**
Time:	**10:00am – 8:00pm**
Venue:	**S503, 5/F, Staunton (Block A), PMQ, 35 Aberdeen Street, Central, Hong Kong**

For more details of the exhibition, please visit:
https://eikeschling.com/2021/09/02/pmq-exhibition-kinetic-grid-structures/

2. 'Zine + Architecture – a collection of ideas in writing and design' Exhibition

   - was curated by a team of postgraduate students under the supervision of Dr Cole Roskam, presenting cross-disciplinary issues that concern the architects-to-be at HKU through self-produced magazines that aim to expand architectural discourses into different contexts and with different audiences.

The exhibition displayed a selection of zines, or self-produced architectural magazines, featuring a diverse range of discursive positions on architecture produced by MArch Y1 students in the Department of Architecture at HKU. The variety of ideas, practices, and polemics offered through these objects spanned different eras in architecture and touched upon numerous cultural, territorial, and technical matters. Collectively, these zines captured a spectrum of our students' thoughts concerning the state of contemporary design practice. This exhibition spoke to the significance of zines as a medium through which designers can question and push the disciplinary boundaries of architecture in new theoretical and global directions.

The zine as a unique self-publishing medium has active roots in both architecture and Hong Kong, making it the perfect vessel through which varying, interactive, and design-oriented perspectives can be introduced and displayed in the city to the public.

The exhibited zines revealed the creative visual and textual modes of expression and exchange at the core of our MArch design programme, and in connection to architecture's fundamental relationship to writing and graphic design. They also offered a vital and exciting means to further diversify and challenge architectural discourses—and the discipline at large—at a time of uncertainty.

Exhibition Co-curators: Chan Ching Yee (MDes Year 3), Ng Poh Li Sherene (MArch Year 2), Siddique Hafsa (MArch Year 2), Zeng Tian (MDes Year 3), and Zhou Moyun (PhD Student)
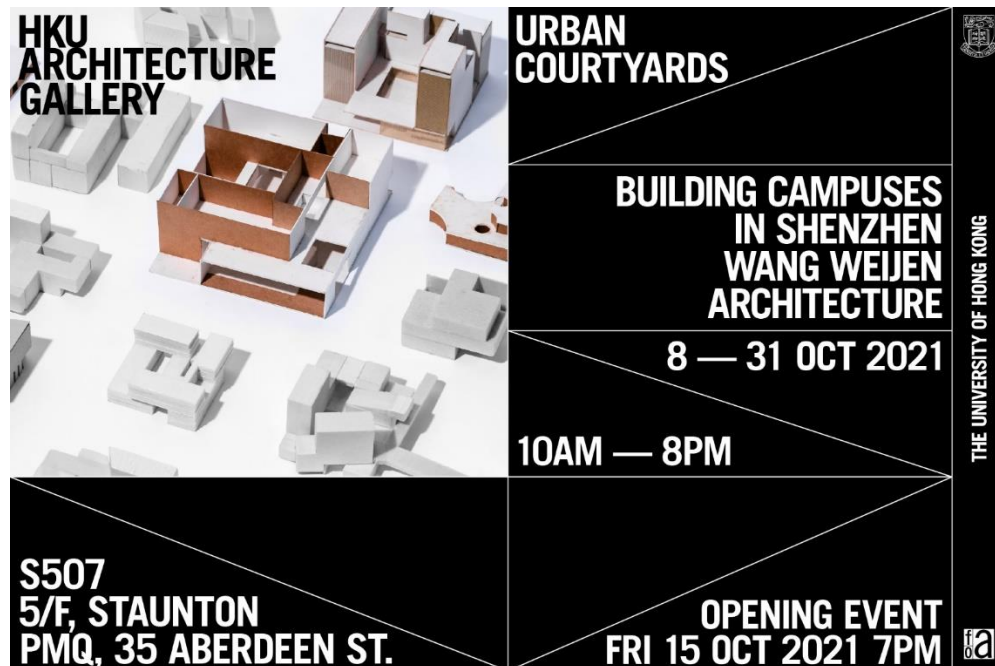
Faculty Adviser: Dr Cole Roskam

Date: 31 August 2021 (Tuesday) – 21 September 2021 (Tuesday)

Time: 10:00am – 8:00pm

Venue: S507, 5/F, Staunton (Block A), PMQ, 35 Aberdeen Street, Central, Hong Kong

Please visit the official webpage of HKU Architecture Gallery for more information.

3. 'Urban Courtyards: Building Campuses in Shenzhen' Exhibition by Wang Weijen Architecture

Through recently built school projects in Shenzhen by Wang Weijen Architecture, the exhibition explores the vertical transformation of the courtyard typology for campus architecture in a high-density urban context. Assembling models and drawings of projects, including the Shixia Primary School, the Jiaokeyuan Middle School, as well as the Library, Student Center and Dormitory for the Chinese University of Hong Kong Shenzhen Campus, the exhibition investigates how the courtyard typology moderates scale with nature, establishing sectional strategies which integrate sky patios and tree terraces for shaping three-dimensional urban courtyards interweaving architecture and landscape prototypes for multilevel campuses in Shenzhen.

Date:	**8 October 2021 (Friday) – 31 October 2021 (Sunday)**
Time:	**10:00am – 8:00pm**
Venue:	**S503, 5/F, Staunton (Block A), PMQ, 35 Aberdeen Street, Central, Hong Kong**
Opening Event:	**15 October 2021 (Friday), 7:00pm**

Please visit the official webpage of HKU Architecture Gallery for more information.

Department of Real Estate and Construction

1. Professor Lawrence Lai

   - introduced the British-built artillery observation post on Braemar Hill in his interview with Nikkei Asia, published on 17 September 2021, through which he also emphasised the importance of military relics in Hong Kong's international history: https://asia.nikkei.com/Life-Arts/Life/Race-to-save-Hong-Kong-s-wartime-relics

Department of Urban Planning and Design

1. ADB-JSP Graduation Gathering

   - was organised by the Asian Development Bank-Japan Scholarship Programme (ADB-JSP), for all the 2021 graduates sponsored by the ADB-JSP Scholarships, on 27 August 2021.

     About 135 participants attended the Gathering, including Professor Bo Sin Tang and graduates of the MUD and MUP programmes. MUD graduate Chandani Shakya shared her learning experience at HKU with ADB Scholars from other universities, followed by a presentation with another MUD graduate, accompanied by MUD Programme Director Alain Chiaradia, showing their commitment to the UN Sustainable Development Goal.

2. Dr Tianren Yang

   - has been named on the 'Forbes 30 under 30 China list for Healthcare and Science 2021'. The honour recognises his innovative research in predictive modelling for sustainable urban development, in his current role as an affiliated researcher at HKU Shenzhen Institute of Research and Innovation (SIRI).

     [Forbes China 福布斯中国发布 2021 年度 30 Under 30 榜单 - 创业](#)

Centre of Urban Studies and Urban Planning

1. Alain Chiaradia

   - was invited to speak at [Walking With Wheels – Panel Discussion](), on 7 September 2021.

Description: *'Walking With Wheels' is a mode of transport. This project highlights the challenges of people who walk with wheels. Through research, discussion and photographs, it draws public attention to the economic, social and safety aspects of walking with wheels. The recording of the webinar is now online: https://fb.watch/7Vh6TXhNlf/*

Speakers: Alain Chiaradia, Associate Professor of Practice at HKU Faculty of Architecture; Julian Kwong, Chairman of Community for Road Safety; Ezreal Sin, Representative of Street Reset

Host: Paul Zimmerman, CEO of Designing Hong Kong

Photo Exhibition

Dates: 8 September to 3 October 2021

Venue: Ping Pong 129 – Gintonería

Address: Basement, 129 Second Street, Sai Ying Pun, Hong Kong

Opening hours: Tuesday-Sunday, 6pm-12am (closed on Monday)

Reservation: 9835 5061

Download Booklet: https://bit.ly/2YGxifG

Media coverage: https://bit.ly/3E0QoNF (SCMP)
https://bit.ly/3zX3Uj3 (Standnews)

- has published the following paper:

Abstract: An outline strategic urban planning vision is a front-end government strategic plan with sparsely defined goals. Methods for an ex-ante appraisal of such sparsely defined vision are limited in the literature. By adapting a reference class forecasting (RCF) methodology, we propose an innovative two-stage combination of Structural Equation Modelling (SEM) and Artificial Neural Networks (ANN) as an explainable ANN strategy to the appraisal of urban planning vision outline. The SEM-ANN operationalizes interaction between job, resident, and multi-modal accessibility in a public transport-dominated city. This strategy is applied to Lantau Tomorrow Vision in Hong Kong, as an extreme case study of a large, reclaimed island. The vision is broadly outlined as a New Town with a third CBD, residential and job targets, road and urban rail transport infrastructure routing, and an overall cost. The results show that the New Town scenario job/population goal should be plausibly attainable by increasing the transport infrastructure accessibility supply. Yet, the simulation indicates that the CBD3 employment goal based on CBD1 is out of range. Overall, our SEM-ANN method, as an adaptation of RCF, is of particular interest in front-end large-scale outline urban planning vision appraisal.

Keywords: SEM, Explainable ANN, Strategic urban planning vision, Multi-modal transport infrastructure, sDNA, spatial multilayer networks, TOD.

Download the paper: *https://authors.elsevier.com/a/1dh4DyDvMl9ZL*

2. Professor Rebecca Chiu

- has published the following article:

Abstract: This paper investigates the implications of a high-density city on the mental wellbeing of the older residents, using Alzheimer's disease and Hong Kong's compact built environment as a case study. Based on past research on attributes of social and built environments conducive to the cognitive function of the elderly and socio-culturally sustainable housing, the paper discusses the implications of Hong Kong's compact

and high-rise urban and residential forms on the prevalence of Alzheimer's disease among older people. The discussion is grounded in the findings of three studies of different spatial scales, investigating the liveability of Hong Kong's built environment for its older people.

3. Professor Shenjing He

   - has published the following papers:

   (i) Zhu, J., **He, S.**, & Hao, J. (2021). Growing rights consciousness of the marginalised and the reshuffling of the landlord–tenant power relationship: Examining a country park-induced displacement in Shanghai. *Population, Space and Place*, e2510. Advance online publication. DOI: https://doi.org/10.1002/psp.2510

   Abstract: *Informal settlements are often subject to government-led demolitions and clearances. In contemporary China, the removal of such settlements often necessitates negotiations between governments and landlords who are hard to dislocate, as exemplified in 'Nail Households' literature, whereas migrant tenants, if any, can be easily evicted without appropriate compensation. Our case study, however, presents evidence contrary to this. Migrant tenants proactively defended their rights and demanded compensation from their landlords. Drawing upon the lens of rights consciousness, this paper examines how the presumably marginalised migrant tenants were able to successfully defend their rights and interests. We found that (i) social capital accumulation, stigmatisation, the exclusion of planning participation and the transfer of clearance responsibility through two rounds of 'state retreats' reinforced the rights consciousness of migrant tenants and served to consolidate their bargaining power, contributing to a reshuffling of the landlord–tenant power position. (ii) The landlords, incentivised by attractive compensation packages, were brought into a temporary and fragile alliance with government agencies to secure the dislocation of the migrant tenants. The landlords thus took responsibility for the clearance from government agencies, whereas the local state was able to tactfully avoid any government–tenant confrontations. Although the tenants were able to secure adequate compensation from their landlords, the overall situation brought an end to the social support that existed in migrant enclaves and thus hampered their upward social mobility. This study revisits the understanding of the reshuffling of the landlord–tenant power relationship, albeit contingent and transient, against the backdrop of changing state–society relations*

   (ii) **Cai, R.**, **Li, C.**, & **He, S.** (2021). Consciousness on property rights, homeowner associations and neighbourhood governance: Evidence from Shanghai. *Cities, 119*, 103350, ISSN 0264-2751. DOI: https://doi.org/10.1016/j.cities.2021.103350

Abstract: Previous studies have scrutinised the proliferation of privately governed neighbourhoods and the role of homeowner associations (HOAs) in governing the neighbourhood and residents' conducts in different contexts, while little attention has been paid to individual residents' agency. This research introduces a novel perspective to examine the role of neighbourhood residents and their perception of property rights, which carry significant weight in governing the private neighbourhoods in transitional urban China. Based on a large-scale neighbourhood-based survey in Shanghai, this study employs multilevel regression models to understand the determinants of individual-level consciousness on property rights and its correlations with the outcomes of HOA <u>governance</u> efficacy at neighbourhood level. Empirical results suggest that housing tenure, community participation, sense of <u>collectivism</u>, gatedness, size and age of neighbourhoods are significantly correlated with residents' consciousness on property rights, and that the rise of consciousness among individual residents is positively associated with the governance efficacy of HOAs. Through presenting a contextualised examination of the emerging "private" governance in China and addressing a missing account of consciousness on property rights in the literature, this study makes theoretical and empirical contributions to understanding the complex social processes of neighbourhood governance in China and beyond

(iii) Wang, K., Qian, J., & **He, S.** (2021). Contested worldings of e-waste environmental justice: Nonhuman agency and e-waste scalvaging in Guiyu, China. *Annals of the American Association of Geographers*, *111*(7), 2165-2184, ISSN 2469-4452. DOI: https://doi.org/10.1080/24694452.2021.1889353

Abstract: Current environmental justice (EJ) research is moving beyond the distributional paradigm to embrace frameworks that emphasize the plurality of EJs. This study proposes that actor-network theory (ANT), which foregrounds nonhuman agency and heterogeneous associations, holds great potential for pushing forward this research agenda. It presents an ANT-informed analysis of the plural epistemologies of EJ by focusing on a global e-waste scalvaging hub—Guiyu in China. E-waste is considered a fluid and emergent material actant. The multiplicity of e-waste materialities coconstitutes the disparate worldings of EJ, with a wide range of actors involved in the knowledge-making practices. Disparate EJ realities concerning e-waste scalvaging have been worlded and enacted through the heterogeneous associations among numerous nonhuman actors, including discarded electronic devices, environmental conditions, pollutants, toxic substances, artifacts, discourses, tools and techniques, and a variety of human stakeholders, ranging from nongovernmental organizations, media, and academics to local scalvagers relying on e-waste for livelihood and wealth. In tracing these heterogeneous associations, this study

juxtaposes two competing EJ worldings related to the ontological indeterminacy of e-waste. It first problematizes the worlding of North-to-South dumping that not only mispresents the complex geographies of e-waste, but also epitomizes a simplified distributional model of EJ. Then it ventures to theorize an often-neglected and underresearched dimension: EJ as situated capabilities and functionings concerned by the local community. This study thus adds to ongoing efforts to advance pluralist epistemologies of EJ.

(iv) Li, L., Wan, W. X., & **He, S.** (2021). The heightened 'security zone' function of gated communities during the COVID-19 pandemic and the changing housing market dynamic: Evidence from Beijing, China. *Land*, *10*(9), 983. DOI: https://doi.org/10.3390/land10090983

Abstract*: The ongoing COVID-19 pandemic has left a strong imprint on many aspects of urban life. Gated communities (GCs) in China are less commonly perceived as a negative and segregated urban form of community compared to other contexts, owing to their wide variety and relative openness. Yet, the enhanced security zone function and the popularity of GCs, along with the heightened segregation and exclusion effects, mean they are most likely to emerge in post-pandemic urban China because of the perceived effectiveness of GCs in preventing health risks by excluding outsiders during the pandemic. Drawing on empirical data from Beijing, this research presents strong evidence for a strengthened perceived 'security zone' effect of GCs during the pandemic. Given that rigid pandemic control measures were organized at the community level, a large-scale household survey in Beijing suggests that residents commonly recognise the effectiveness of GCs in security control and show a strong preference for GCs over open communities after the pandemic, even though there is a lack of direct evidence of reduced COVID-19 risk in GCs. The heightened perceived 'security zone' function of GCs has shown a significant impact on the housing market, evidenced by an increase of 2% in the housing prices for GCs, compared with those of open communities. The rising popularity of GCs is also evidenced by a significant increase in property viewings by potential homebuyers and smaller price discounts in actual transactions in gated communities vis-à-vis open communities. We argue that the rising risk-averse sentiment in the post-pandemic era has given rise to the popularity of GCs. This study provides timely and fresh insights into the changing meaning of GCs in post-pandemic China.*

- was invited to give the following talks:

(i) 'Loft-living under state-led financialisation: Adaptive reuse of industrial buildings for long-term rental apartments in Beijing, China',

The Regional Studies Association Research Network on Financial Geography (FinGeo) online seminar series, 29 June 2021.

(ii) '(Re)imaging and governing the post-pandemic city', Guangzhou Institute of Geography, Guangdong Academy of Sciences, China Academy of Sciences, 9 August 2021.

4. Dr Derrick Ho

- has published the following papers:

(i) Cong, J., Wang, L. B., Liu, F. J., Qian, Z., McMillin, S. E., Vaughn, M. G., Song, Y., Wang, S., Chen., S., Xiong, S., Shen., X, Sun, X., Zhou, Y., **Ho., H.C.*** & Dong, G. H. (2021). Associations between metabolic syndrome and anthropogenic heat emissions in northeastern China. *Environmental Research, 204*(Part A), 111974, ISSN 0013-9351, DOI: https://doi.org/10.1016/j.envres.2021.111974

Background: Recent research attention has been paid to anthropogenic heat emissions (AE), temperature increase generated by human activity such as lighting, transportation, manufacturing, construction, and building climate controls. However, there is no epidemiological data available to investigate the association between anthropogenic heat emissions and metabolic syndrome (MetS), a cluster of conditions that increase risk of stroke, heart disease and diabetes.

Objective: To explore the relationships between AE and MetS in China.

Methods: We recruited 15,477 adults from the 33 Communities Chinese Health Study, a cross-sectional study in northeastern China. We retrieved anthropogenic heat flux by collecting socio-economic and energy consumption data as well as satellite-based nighttime light and Normalized Difference Vegetation Index datasets, including emissions from buildings, transportation, human metabolism, and industries. We also measured MetS components consisting of triglycerides, high density lipoprotein cholesterol, fasting glucose, systolic blood pressure, and diastolic blood pressure, and waist circumference. Restricted cubic spline models were applied to assess the associations between AE and MetS.

Results: The median flux of total AE was 30.98 W/m2 and industrial AE was the dominant contributor (87.64%). The adjusted odds ratio and 95% confidence interval (CI) of MetS for the 75th and 95th percentiles of the total AE against the threshold were 1.29 (95% CI: 1.21, 1.38) and 1.65 (95% CI: 1.47, 1.85). Greater AE was associated with higher odds of MetS in a dose-response pattern, and the lowest point of U-shape curve indicated the threshold effect. Participants who are young and middle-aged exhibited stronger associations between AE and MetS.

Conclusions: Our novel findings reveal that AE are positively associated with MetS and that associations are modified by age. Further investigations into the mechanisms of the effects are needed.

(ii) GBD 2019 Dementia Collaborators. (2021). Use of multidimensional item response theory methods for dementia prevalence prediction: An example using the Health and Retirement Survey and the Aging, Demographics, and Memory Study. *BMC Medical Informatics and Decision Making, 21*(1), Article 241. DOI: https://doi.org/10.1186/s12911-021-01590-y

Background: Data sparsity is a major limitation to estimating national and global dementia burden. Surveys with full diagnostic evaluations of dementia prevalence are prohibitively resource-intensive in many settings. However, validation samples from nationally representative surveys allow for the development of algorithms for the prediction of dementia prevalence nationally.

Methods: Using cognitive testing data and data on functional limitations from Wave A (2001–2003) of the ADAMS study (n = 744) and the 2000 wave of the HRS study (n = 6358) we estimated a two-dimensional item response theory model to calculate cognition and function scores for all individuals over 70. Based on diagnostic information from the formal clinical adjudication in ADAMS, we fit a logistic regression model for the classification of dementia status using cognition and function scores and applied this algorithm to the full HRS sample to calculate dementia prevalence by age and sex.

Results: Our algorithm had a cross-validated predictive accuracy of 88% (86–90), and an area under the curve of 0.97 (0.97–0.98) in ADAMS. Prevalence was higher in females than males and increased over age, with a prevalence of 4% (3–4) in individuals 70–79, 11% (9–12) in individuals 80–89 years old, and 28% (22–35) in those 90 and older.

Conclusions: Our model had similar or better accuracy as compared to previously reviewed algorithms for the prediction of dementia prevalence in HRS, while utilizing more flexible methods. These methods could be more easily generalized and utilized to estimate dementia prevalence in other national surveys.

5. Dr Derrick Ho and Dean Webster

- have co-authored the following paper:

Ho, H. C., Guo, H., Chan, T. C., Shi, Y., **Webster, C.**, & Fong, K. N. K. (2022). Community planning for a "healthy built environment" via a human-environment nexus? A multifactorial assessment of environmental characteristics and age-specific stroke mortality in

Hong Kong. *Chemosphere, 287*(Pt 3), 132043, ISSN 0045-6535. DOI: https://doi.org/10.1016/j.chemosphere.2021.132043

Abstract*: With the prevalence of stroke rising due to both aging societies and more people getting strokes at a younger age, a comprehensive investigation into the relationship between urban characteristics and age-specific stroke mortality for the development of a healthy built environment is necessary. Specifically, assessment of various dimensions of urban characteristics (e.g. short-term environmental change, long-term environmental conditions) is needed for healthy built environment designs and protocols.*

A multifactorial assessment was conducted to evaluate associations between environmental and sociodemographic characteristics with age-stroke mortality in Hong Kong. We found that short-term (and temporally varying) daily PM10, older age and being female were more strongly associated with all types of stroke deaths compared to all-cause deaths in general. Colder days, being employed and being married were more strongly associated with hemorrhagic stroke deaths in general. Long-term (and spatially varying) regional-level air pollution were more strongly associated with non-hemorrhagic stroke deaths in general. These associations varied by age. Employment (manual workers) and low education were risk factors for stroke mortality at younger ages (age <65). Greenness and open space did not have a significant association with stroke mortality. Since a significant connection was expected, this leads to questions about the health-inducing efficacy of Hong Kong's compact open spaces (natural greenery being limited to steep slopes, and extensive impervious surfaces on public open spaces). In conclusion, urban plans and designs for stroke mortality prevention should implement age-specific health care to neighborhoods with particular population segments.

6. Professor Bo Sin Tang

 - has published the following paper:

Wong, S. W., **Tang, B. S.**, Liu, J., Liang, M., & Ho, W. K. O. (2021). From 'decentralization of governance' to 'governance of decentralization': Reassessing income inequality in periurban China. *Environment and Planning A: Economy and Space, 53*(6), 1473-1489. DOI: https://doi.org/10.1177/0308518X20988013

Abstract*: Grassroots village organizations are crucial for understanding the interplay between the decentralization of state power and growing income inequality in periurban China. Based on a study of 380 shareholding cooperatives and 43 administrative villages in Guangdong, we examine how state policy has interacted with village institutions to determine the management and distribution of collective income among villagers. Our findings suggest that the decentralization of power over collective asset management and distribution to these grassroots*

organizations did not cause a retreat in the state's capacity for strategic intervention and local regulatory controls. Rather, the state made continued attempts to regain power over village governance through institutional formalization. Such interventions enhanced the access of villagers to state welfare. However, they worsened income disparities among villagers by undermining the village redistributive mechanism based on informal rules.

7. Dr Tianren Yang

   - has published the following paper:

Wan, L., **Yang, T.***, Jin, Y., Wang, D., Shi, C., Yin, Z., Cao, M. & Pan, H. (2021). Estimating commuting matrix and error mitigation – A complementary use of aggregate travel survey, location-based big data and discrete choice models. *Travel Behaviour and Society, 25*, 102-111. DOI: https://doi.org/10.1016/j.tbs.2021.04.012

Abstract*: The prevalence of location-based big data has opened a new research frontier for estimating origin–destination commuting matrices for cities where granular flow data are not yet available from official sources. However, investigations into estimation errors and potential correction methods have been rare in the literature. To address the research gap, this paper first compares the performance of two estimated commuting matrices for Shanghai, derived by two distinct matrix estimation methods, namely a big-data approach using mobile phone signalling data and a discrete choice model for simulating the residential location of commuters. The empirical results indicate an outstanding analytical complementarity of the two approaches. A novel method is then proposed for mitigating the errors associated with the big-data approach. The proposed method features a selective blending of the big-data based flow estimation and the model-based estimation. By comparing the blended flow estimation with benchmark travel statistics, we find that the proposed method would significantly reduce the estimation errors and hence improve the robustness of the estimated matrix. It is expected that the proposed method will set a new standard for correcting potential errors in big-data based flow estimation.*

8. Dr Xiaohu Zhang

   - has published the following paper:

Zhang, X. (2021). Beyond expected regularity of aggregate urban mobility: A case study of ridesourcing service. *Journal of Transport Geography, 95*, 103150, ISSN 0966-6923. DOI: https://doi.org/10.1016/j.jtrangeo.2021.103150

Abstract: *The regularity of urban mobility is a tacit understanding in public transportation planning. Many studies investigated regularity in the context of individual travel while fewer were found on aggregate*

mobility. This work proposes a generic measure of regularity to quantify the degree of repetition of a time or spatial data series. In addition, it discusses how the properties of a data series itself may dictate the regularity and adopts parametric bootstrapping to estimate the residual regularity that deviates from realizations of stochastic processes. The proposed measure can examine not only the periodicity of trip generation in locations but also the stationarity of travel flows. The experiments were conducted on a ridesourcing dataset, including more than six million trips in Chengdu, China. Both the temporal and spatial regularities were investigated at distinct time intervals. We discussed how the total travel volume and the peakedness of probability distribution could affect the regularity. It was found that regularity was positively associated with the total volume and the peakedness. We further examined the impact of the built environment on regularity and the effects of spatial and temporal scales. The results show both point-of-interest density and diversity and tourist attractions contribute to regularity. Regularity grows linearly as the spatial and temporal scales increase exponentially. Lastly, different specifications of regularities were compared, and the outcome was generally consistent across different similarity measures including coefficient of determination, Manhattan distance, Euclidean distance, cross-entropy and cosine similarity.

Healthy High Density Cities Lab

1. Ka Yan Yvonne Lai (PhD candidate supervised by Dr Chinmoy Sarkar and Dean Webster)

   - her abstract co-authored with Dean Webster, Professor John Gallacher, Sarika Kumari and Dr Chinmoy Sarkar, titled 'Associations of neighbourhood housing density with loneliness and social isolation: a cross-sectional study using UK Biobank', has been accepted for the 2021 Public Health Science Conference and publication in *The Lancet*.

2. Dr Chinmoy Sarkar, Ka Yan Yvonne Lai, Sarika Kumari, Dean Webster

   - their co-authored paper published in collaboration with Dean Gabriel Leung and Dr Michael Ni of School of Public Health, LKS Faculty of Medicine has been accepted for publication by *PLOS Medicine*:

   Sarkar, C.*†, Lai, K. Y.†, Ni, M. Y., Kumari, S., Leung, G., Webster, C. (2021). Liveable residential space, residential density and hypertension in Hong Kong: A population-based cohort study. *PLOS Medicine* (PMEDICINE-D-21-01205R2, *accepted-in-press*). [IF: 11.069, Ranking: 10/169, Q1 in Medicine, General & Internal].

   * corresponding author, † joint first-author (equal contribution)

Ronald Coase Centre for Property Rights Research

1. Professor K W Chau, Dr Lennon Choy and Professor Lawrence Lai

   - have written on the idea of 'Land Readjustment' and its possible application in Hong Kong, published as '善用「土地區劃整理」加快新市鎮發展' on the Hong Kong Economic Times, on 5 October 2021: https://paper.hket.com/article/3073996

Sustainable High Density Cities Lab

1. Dr Ren Chao

   - has received the Merit Award of HKIUD Urban Design Awards 2021 (Research category) for her joint research work based on the following paper:

   Lan, H., Lau, K. K.-L., Shi, Y., & **Ren, C.** (2021). Improved urban heat island mitigation using bioclimatic redevelopment along an urban waterfront at Victoria Dockside, Hong Kong. *Sustainable Cities and Society, 74*, 103172, ISSN 2210-6707.
   DOI: https://doi.org/10.1016/j.scs.2021.103172

   Abstract: Bioclimatic design provides solutions to mitigating the urban heat island (UHI) effect and improving urban quality of life. Waterfront settings provide a unique opportunity for UHI mitigation, as cool winds (i.e. sea breezes) provide good cooling conditions. We used ENVI-met numerical simulations to investigate the synergistic mitigation effects of redeveloped urban forms, ventilation corridors, and extensive greenery on local microclimate and outdoor thermal comfort at an urban waterfront in Victoria Harbour, Hong Kong. The thermal performance along the waterfront and within an inner urbanised area was evaluated in three scenarios: existing configuration (Case A), redeveloped building form (Case B), and Case B with a ventilation corridor and extensive greenery added. In the study area's subtropical climate, the additional strategies used led to a synergistic improvement in microclimate and thermal comfort in both settings. The appropriate use of combined urban forms and ventilation corridors along waterfronts can thus lead to a more acceptable pedestrian-level wind environment and enhance the ventilation potential within inner urbanised areas. The cooling intensity of greenery (turf and green facades) along such waterfronts can also be extended for further benefits. Overall, the synergistic mitigation effects of redeveloped urban forms, ventilation corridors, and extensive greenery in proximity to water bodies demonstrated here provide science-based guidance for the use of bioclimatic design along urban waterfronts in order to achieve improved microclimates and thermal comfort at neighbourhood scales.

Award Title: HKIUD Urban Design Awards 2021 (Research) – Merit

Research Title: Improved urban heat island mitigation using bioclimatic redevelopment along an urban waterfront at Victoria Dockside

Collaborators:

- The Chinese University of Hong Kong
- The University of Hong Kong
- Ronald Lu & Partners (Hong Kong) Ltd.
- BEHAVE Ltd.

Official Announcement:
https://www.hkiud.org/awards/2021/2021awards.php

- has co-authored a new book titled *Outdoor Thermal Comfort in Urban Environment: Assessments and Applications in Urban Planning and Design*, to be officially published by Springer in January 2022:

Lau, K. K.-L., Tan, Z., Morakinyo, T. E., & **Ren, C.** (2022). *Outdoor thermal comfort in urban environment: Assessments and applications in urban planning and design*. Springer. DOI: https://doi.org/10.1007/978-981-16-5245-5
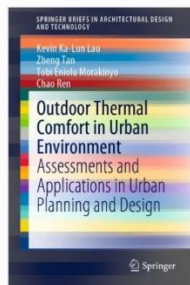
SPRINGER BRIEFS IN ARCHITECTURAL DESIGN AND TECHNOLOGY

Kevin Ka-Lun Lau
Zheng Tan
Tobi Eniolu Morakinyo
Chao Ren

Outdoor Thermal Comfort in Urban Environment
Assessments and Applications in Urban Planning and Design

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Outdoor Thermal Comfort in Urban Environment

Assessments and Applications in Urban Planning and Design

Authors (view affiliations)

Kevin Ka-Lun Lau, Zheng Tan, Tobi Eniolu Morakinyo, Chao Ren

Highlights the importance of outdoor thermal comfort for improving urban living quality

Addresses urban geometry and thermal environment at the neighborhood scale

Is a valuable guide for urban climate researchers, urban planners/designers, and policymakers

Abstract: Outdoor thermal comfort studies have proved that urban design has a great influence on pedestrians' thermal comfort and that its assessment helps one to understand the quality and usage of the pedestrian environment. However, the majority of outdoor thermal comfort studies perceive pedestrian thermal comfort as "static". The dynamic multiple uses of urban spaces and the highly inhomogeneous urban morphology in high-density cities of the tropics are seldom considered, which leads to a lack of understanding about how pedestrians respond to the changes of the outdoor environment. This study contributes to the understanding of the dynamic thermal comfort using a longitudinal survey that was conducted to obtain information about how thermal sensation changes throughout the walking route and how it is affected by micrometeorological conditions and the urban geometry. The large variations in micrometeorological conditions throughout the walking routes are predominantly influenced by the urban geometry. Additionally, the spatial pattern of thermal sensation varies based on the weather conditions, emphasising the need to account for such variations in the assessment of pedestrian thermal comfort. The results also show that thermal sensation was associated with participants' short-term thermal experience (2–3 min) and that the urban geometry plays an important role in the time-lag effect of meteorological variables on thermal sensation. The findings of this study contribute to improving urban geometry design in order to mitigate the thermal discomfort and create a better pedestrian environment in high-density cities.