*Professor Nasrine Seraji continues the theme of 1:1 modelling
in response to the Dean's blog in the last issue of DRup*:

From the desire of understanding the world to the search and desire of changing it…

The life of the student, the teacher, and the architect

Last month, the Dean's RoundUp known as DRup at HKU's FoA was an "invitation" to rethink *"Alice au pays des Merveilles"*; or the *Voyage of All Possibles*?

The DRup's subliminal message was *"make BIM the fundamental language of architectural education"*. One is tempted to immediately have a gut reaction and say, *"but BIM is just another software that anyone can learn and it only allows for management of construction. It's a waste of time for architects to become BIM specialists!"*

But no, I am taking this opportunity that Dean Webster is offering to open up a round of discussions with other colleagues in the Faculty. I hope to clarify our role and purpose as architects, as well as the necessity for architecture as an intellectual discipline which links the society, politics, and economy via sociology, anthropology, and even the technology of its time. I feel that architects are often understood as problem solvers and makers of forms who respond to a given brief by clients and therefore easily replaceable by AI and all sorts of technological breakthroughs.

Header image: 3D accessibility evaluation of outdoor and indoor privately own public space (POPS) in Quarry Bay using HKU's Quarry Bay operational 3D data model and sDNA, LandsD's 3D pedestrian network open data and LandsD's 3D spatial model open data. HKU's Quarry Bay operational 3D data model, analysis and visual are produced by Lingzhu Zhang, Sid Khakhar, Minyu Cui, Alain Chiaradia, and many RAs; LandsD's 3D pedestrian network is based on HKU's 3D pedestrian network produced by Guibo Sun, Xiaohu Zhang, Chris Webster, and many RAs. Dean Webster and Alain Chiaradia initiated the project. (More information on p. 14)

Context

It all started with a question about *scale* at a Zoom meeting in November prior to the last session of the new FIC1001 Faculty Interdisciplinary Course with its 1001 stories.

I had planned to talk about the different scales in my lecture (on their relationships with Architecture and Health) from Small to Medium, Large, Extra-Large and lastly to [XXL] and the relative impact of some architectural references on our lives since the 1900s. Dean Chris Webster, who was teaching in the same session, asked me whether, in architectural scale, *small* was literal or phenomenal (well, not exactly in those words but it was my interpretation), since *small-scale* can mean something different across the built environment disciplines. Small may be phenomenal (a tiny object), or the scale (the mathematical ratio) can be small, which usually means that when you are looking at it on a map, it is a large phenomenon (a town on a 1: 50,000 map). This initiated a discussion on what *scale* means to architects and landscape architects.

Ray and Charles Eames, American designers (well researched by Dr. Eric Schuldenfrei, head of DoA), had already made a statement on *scale* through their famous film – *Powers of Ten* almost 50 years ago proclaiming that **"scale is relative"**. It was then brought up by the architectural insertion of **"size matters"** in the late 90s, based on Rem Koolhaas's Magnum Opus – *SMLXL*. That was when Dean Chris Webster asked me to respond to his next DRup.

Architecture is a very ancient subject

It is full of contradictions, that is exactly why it is potent and impotent at the same time. Architecture is both a thing and an act.
At times it makes you feel extremely hopeful; and at times it depresses us.
Sometimes it makes us feel that we can change the world; and a few hours later after a discussion with a client, a teacher, a politician or a critic, it can make you feel completely ineffective.
It is joyful and it is painful; even though it seems simple, it is complex.
It is very difficult to be a good architect as everyone thinks they are architects.
An architect needs to be like a Swiss Army knife – to be able to open a bottle, screw a screw, cut a piece of metal, file a nail as well as go through an airport x-ray machine without being noticed.
Architecture is a beautifully complex discipline – it allows us to think how we can make things that have a foot in the past but are forward looking – Architects have eyes in the back of their heads, but they always go forward.
Architects believe in the intelligence of the societies in which they work.
Architects need to have a sense of humour – as well as understanding the pain and grief of those who do not realise Architecture is a right and not a privilege.
But having said all of that;

Architecture is the Art of Making more with what we have
more Quality,
more Meaning,
more Pleasure,
for a
very long time.

Representation or Presentation

Architecture has always worked through representation, imagination, and design for improvement. It has always projected the future; the word *project* is an intention not a fixed finished reality.

Modernism, when it was a cause and not a style, taught us that design must be socially responsible, politically alert, and economically viable.

Drawings, models, and artefacts that describe the final spatial construct have always been a diminutive of the thing itself. Different scales open our eyes to a variety of possibilities. When we draw at 1:10000, the issues at stake are not the same as those in a drawing at 1:500 or 1:50. Scaling is a very complex process that the architect needs to grasp. Often, we can criticise a project by saying it is *out of scale* or that the architect has not understood the basics of scale. The one to one / 1:1 or what my generation called the *"true to scale"* model of something is often a prototype and will only represent one reality. In architecture, contrary to manufacturing (i.e. of cars) where the final prototype is multiplied by millions, the edifice remains singular. There is only one Villa Savoye, one Farnsworth house, and one Schminke house. Yet, they all have one thing in common, which confers them with the canonical place they have carved in the history of Modern architecture – they are all houses which represent the cultural, technical, social, and material theses of their time.

In architecture the prototype is the final object finalising the process of imagination and divulging the reality of the "thing". In such case the "model" and the "thing" are the same, the "model" is no longer a representation but the presentation of the "thing" itself.

Dean Chris Webster's citing of the rain bridge – *"Donn's sublime rain bridge and sun shelter in a Fujian field"* is the perfect example of this condition. The 1:1 model is also the bridge itself, hence, more of a demonstration than an imagined speculation.

This opens up a totally different chapter of architectural education which was very much in vogue in the 60s. It's the most famous proponent at Black Mountain College – Buckminster Fuller, an inventor, mathematician, biologist, engineer – who is considered an architect but didn't train as one. His works with his students were mostly about 1:1 models in order to design new structures through failure.

So, if *BIM* and *in-silico* can model every constraint including failures, then the learning from failure will disappear and the architect will simply be a highly paid sophisticated manager.

Education

Architecture is not only about construction, nor is it simply a profession. I prescribe to Le Corbusier's famous saying – Architecture is not a vocation, it is a state of mind.
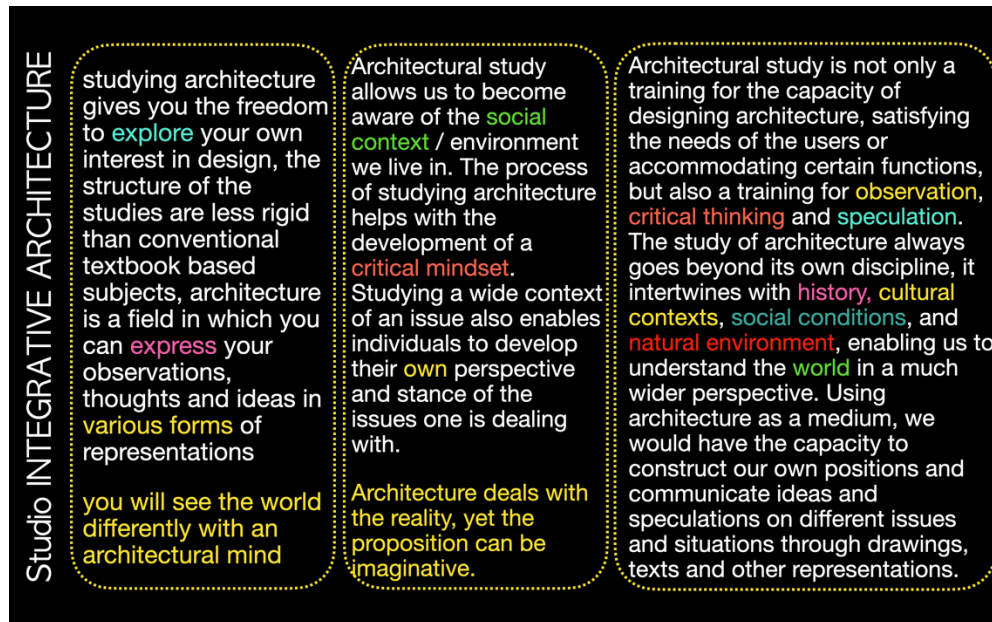
How can we teach a "state of mind" though? This saying takes us to a whole other world of possibilities for architectural education (if you are interested you can read my speculations on this in DoA's 2020 prospectus as the new classics).

Someone who studies medicine will end up practicing medicine; it takes a very conscious decision on the part of a practicing medical doctor to diverge into other disciplines, such as being a writer, a historian, a publisher, or a critic, or even an architect, like myself. I dropped out of a medical school to study architecture back in the days when architects were referred to as paper architects due to the petrol crisis and deficit of construction.

Architecture students study architecture to learn about the world, its many complex orders, societies, politics, economies, and how human beings interact with their environments. They are interested in reading, writing, and understanding as much as making and discovering through material failures and constraints the best way to improve our living environments. Today, architecture students are aware of their responsibility toward the planet much more than our generation was. They look at the origin of where and how construction material is produced, they consciously refuse to take toxic insulation material which in architectural offices is specified by many building surveyors as the one and only material to wrap buildings in. It only takes one look around the 2nd, 3rd, 4th floor studios of HKU Faculty of Architecture's Knowles Building to see the amount of toxic insulation foam around for making models. Our students are emptying the market of this toxic material in order for contractors to look at alternative ways of insulating buildings ☺.

Architecture education is a tremendous opportunity for enabling the restless young generation to consciously move into a wealth of diverse professions beyond practicing architecture. They can be politicians, environmental activists, designers, graphic designers, writers, critics, historians, film makers, journalists, investigators ...

Below is an extract of why studying architecture is crucial in 2021. The words are by students of the MArch Integrative Studio taught by Dr Tao Zhu and myself this past semester.

Studio INTEGRATIVE ARCHITECTURE

studying architecture gives you the freedom to explore your own interest in design, the structure of the studies are less rigid than conventional textbook based subjects, architecture is a field in which you can express your observations, thoughts and ideas in various forms of representations

you will see the world differently with an architectural mind

Architectural study allows us to become aware of the social context / environment we live in. The process of studying architecture helps with the development of a critical mindset. Studying a wide context of an issue also enables individuals to develop their own perspective and stance of the issues one is dealing with.

Architecture deals with the reality, yet the proposition can be imaginative.

Architectural study is not only a training for the capacity of designing architecture, satisfying the needs of the users or accommodating certain functions, but also a training for observation, critical thinking and speculation. The study of architecture always goes beyond its own discipline, it intertwines with history, cultural contexts, social conditions, and natural environment, enabling us to understand the world in a much wider perspective. Using architecture as a medium, we would have the capacity to construct our own positions and communicate ideas and speculations on different issues and situations through drawings, texts and other representations.

Epilogue

Food for thought: Mies van der Rohe's Seagram Building was 50% over budget; the Trump Tower in NYC was 50% under budget. The question is – which one moved the discourse on architecture or the relationship of architecture to the city / material to technology / Russia vs America, China vs America, to another level…?

Collegially yours,
Nasrin-Jeanne Seraji - AADIPL FRIBA

Message from the Dean:

So many thanks to Nasrine for the above, beautifully-written, provocative and clever analysis. It takes the discussion of scale, modelling, BIM in architecture, representational language, and 1:1 forward in so many ways.

Very much related to the provocation of what Nasrine calls 'true-scale' model (1:1) is the idea of how an analyst or designer uses a model for systematic exploration by holding certain dimensions constant (controlling them) while varying the others. I have asked Eric Schuldenfrei to think about a DRup blog reflecting on the issue of control in architectural design; and KW Chau, former head of FoA's Department of Real Estate and Construction, to reflect on the same in the context of modelling real-estate and other urban economic phenomena. After that, if the juices are still flowing, perhaps Guibo Sun (DUPAD) can share some snappy thoughts on control in natural experiments; Bin Jiang (DLA) can do the same for laboratory experiments; and Alain Chiaradia can bring another French intellectual perspective, sharing his approach to

modelling, wholism (general equilibrium) and design-dimension control (partial equilibrium) in urban design. Then we could all write a book on the subject.

Many congratulations to all mentioned below. FoA is flying high. Some of the highlights that struck me when reading through this DRup, include our students' achievements (not one but two of Natalia's students winning a regional urban design competition, and Wilson's REC students bringing home most of the prizes in an international construction management competition); Shenjing He's breathtaking output of research papers – reading just those listed in this issue of DRup gives a good overview of current trends in Urban Studies research; FoA's 'national treasure' Professor Anthony Yeh's continuing accrual of the highest level of academic recognition; FoA's second HKD 10M+ research grant within a few months, and being led by FoA across REC and DUPAD departments, with team members from the Faculty of Engineering.

Best wishes to all for a happy, safe, restorative and prosperous 2021.

Chris
Dean, HKU FoA

Teaching and other Achievements

DoA

1. Dr. Cole Roskam

   - Nominated by the Faculty of Architecture and approved by the University Research Committee, Dr. Roskam has received the 2020 Research Output Prize for his research in *Improvised City: Architecture and Governance in Shanghai, 1843-1937*, University of Washington Press, 2019, 304pp. Dr. Roskam will receive a monetary award of HK$120,000 for his core research activities during the award period from 14 December 2020 to 13 December 2021, under the conditions set out by the above Prize.

DLA

1. Dr. Ren Chao

   has received Silver Award at the Hong Kong Institute of Planners (HKIP) Awards 2020, for her project "Urban Ventilation Assessment and Wind Corridor Plan for Chinese Cities".

   Gist of Adjudicators' Comments:

   • Building on the experiences obtained from similar studies in Hong Kong, the cross-disciplinary collaboration is a pioneering attempt in Mainland China to investigate and quantify urban ventilation effects of major planning and development proposals.

   • The submission sets a standard method for conducting urban ventilation assessment and creating urban ventilation corridor plans, which would contribute significantly to the alleviation of adverse urban heat island effects in the existing and new development areas. It has also demonstrated how urban ventilation assessment can be incorporated into the master plans at regional, city and neighbourhood levels.

   • The assessment tool can readily be followed in other places, thus helping to promote sustainable, green and healthy cities in China and elsewhere.

   • The study vividly demonstrates the importance and merits of bridging academic research and planning practice. It sets an excellent example of how a locally developed planning assessment tool can be 'exported' to other cities, which is worth commending and should be encouraged.

2. Natalia Echeverri

- The following students of Natalia won a GBA Urban Design Award and a FuturArc Prize for their projects at the MLA Year 2 studio in Fall 2019, as part of the HKU – UC Berkeley Collaboration.

    (i) He Jia Lei, Constance, MLA Class of 2020, won the Gold Award in the Greater Bay Area Urban Design Awards 2020 (student category), for her project entitled "Alluvial Shoreline – The Retrofit of Sediment Action Between Industry and Fishery".

    https://www.hkiud.org/awards/2020/pdf/GBA_Urban_Design_Awards_2020_Award_Winner_List_1124.pdf

    (ii) Yan Tsz Ching, Jenny, MLA Class of 2020, won the second prize in the FuturArc Prize 2020 (student category) for her project entitled "Matrix Sponge".

    FuturArc Prize 2020 – Students – Winners | FuturArc

Yan Tsz Ching is pursuing her master's degree in Landscape Architecture at the University of Hong Kong. Her academic projects and work experience focus on sustainability and climate change resilient designs in Hong Kong and Asian cities. Yan has actively devoted her experience in landscape architecture to various cross-disciplinary projects with architecture and urban planning. After graduation, she hopes to participate in related projects around the world.

REC

1. Professor Kelvin Wong

   - has been appointed [Panel Member to the Engineering Panel (General Research Fund and Other Funding Schemes for Individual Research) of The Research Grants Council of Hong Kong](#) from 1 November 2020 to 31 October 2022.

DUPAD

1. Dr. Derrick Ho

   - has been appointed as a member of the Early Career Advisory Board for the Environmental Research journal (Publisher: Elsevier). His term for the editorship started on 1 January 2021 and will end on 31 December 2022.

2. Professor Bo-sin Tang

   - has been appointed by the Development Bureau of the Hong Kong SAR Government on 18 December 2020, as one of the Technical Advisors to offer professional advice to the Tender Assessment Panel chaired by the Permanent Secretary for Development (Planning and Lands) on the non-premium proposals in the tender bids for Site 3 of the New Central Harbourfront. Site 3 is a government sale site expected to become a new landmark for Hong Kong, setting a benchmark for people-centric design with emphases on sustainable and urban design considerations as well as integration with the surroundings.

   - has received Certificate of Merit Award at the [Hong Kong Institute of Planners (HKIP) Awards 2020](#), for the submission entitled "WAAT: A New Approach for Assessing Outdoor Walking Accessibility to Public Open Space in Hong Kong Territories", prepared by a team including Professor Tang, Mr. Kenneth K.H. Wong (BAUS and MUP Graduate), Dr. Kenneth S.S. Tang (Adjunct Associate Professor, DUPAD) and Dr. Ivy S.W. Wong of PolyU.

     This submission is based on Professor Tang's GRF-funded project of 2017/18, titled "Open Space in Hong Kong: Spatial Distribution, Access and Disparity" (Project Number: 17202617).

Smart Planning Initiatives 智慧新思

WAAT: A New Approach for Assessing Outdoor Walking Accessibility to Public Open Space in Hong Kong
## WAAT: 評估香港公共休憩空間步行可達性的新方法

WAAT (Walking Accessibility Assessment Tool) is a GIS-based planning tool which facilitates urban planners to plan and assess the walking accessibility of public open space (POS) in the comprehensive environment of Hong Kong. The analysis has been improved through considering additional factors, such as pedestrian networks, street topography, formal crossings, physical barriers to walking and designated access points. It also allows for uneven walking speeds of pedestrians, such that walking uphill is different from walking downhill.

Combined with the Gravity Model, WAAT can assist urban planners to evaluate the spatial distribution of POS in a planning area, compare the situations across different new towns/districts and identify possible improvement actions. Integrated with smart technology, WAAT helps urban planners to build Hong Kong into a walkable, smart and healthy city.

WAAT是一種利用地理信息系統平台操作的規劃工具，可幫助城市規劃師在考慮香港綜合城市環境下，更好地規劃和評估公共休憩空間的步行可達性。它通過考慮影響戶外步行的多種因素，例如行人路網絡、路面坡道、過路設施、步行障礙和公園出入口位置等，還顧及不同的步行速度，例如上坡與下坡速度，從而改善傳統規劃評估方法的不足。

WAAT可以結合重力模型幫助城市規劃師評估規劃區域內公共休憩空間的分佈，比較不同新市鎮/發展區的情況，找出改善措施。WAAT也可以結合其他智能科技，幫助規劃師將香港建設成一個更宜步行、更智能化和更健康的城市。
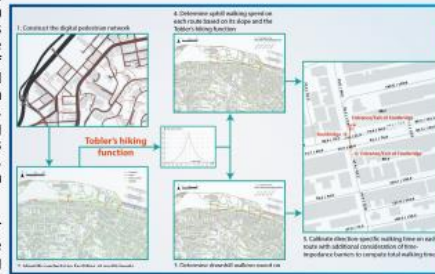
Gist of Adjudicators' Comments:

- A novel application of technology to facilitate planning assessment of outdoor walking accessibility to public open space in a multi-level environment, taking due heed of a wide range of considerations like topology and distance of the pedestrian network, slopes, walking speeds as well as physical barriers to pedestrian movements.
- This GIS-based planning tool is innovative, practical and versatile, which can easily be applied to various site-specific case studies and sensitivity/loading analysis. The current impact assessment system in Hong Kong could be expanded to include a walking accessibility assessment of various community facilities vis-à-vis their target users.
- The study vividly demonstrates how an academic study could be translated into a useful and practical planning tool, which is commendable and should be promoted.

評審意見撮要：

- 一種新穎的應用技術，協助評估公共休憩空間在多層戶外步行環境中的可達性。它充分考慮了步行網絡的結構和距離、坡度、步行速度以及實體障礙等對行人活動影響的因素。
- 這個建基於地理資訊系統的規劃工具具創新性、實用性和多功能性，可輕易應用於特定地點的案例研究和敏感度/負荷分析。亦可用作評估香港各種社區設施對其使用者的步行可達性。
- 此研究實在地展示了如何將學術研究轉化為實用的規劃工具，值得稱讚及加以推廣。

3. Professor Anthony Yeh

- has been elected Member of the Hong Kong Academy of Sciences (HKAS) for his pioneering research on GIS and its application as a planning support system in urban planning and management.

  Membership of the Hong Kong Academy of Sciences is one of the most prestigious awards in Hong Kong. Not more than five new members may be elected once every two years in its Annual General Meeting. Members of academies of sciences outside Hong Kong are not automatically elected as Members of HKAS. Professor Yeh was one of the three newly elected Members in this two-year cycle.

  http://www.ashk.org.hk/en/news/details/87

Professor Yeh received the Membership Certificate of the Hong Kong Academy of Sciences from Professor Lap-chee Tsui, President of the Academy, in its 4th Annual General Meeting on 26 November 2019.

- has been elected Founding Fellow of the Geographical Society of China in November 2020.

- has been appointed [Panel Member to the Engineering Panel (General Research Fund and Other Funding Schemes for Individual Research) of The Research Grants Council of Hong Kong](#) from 1 November 2020 to 31 October 2022.

Research Achievements

Centre of Urban Studies and Urban Planning

1. 3D Pedestrian Network

- The HKSAR Lands Department released a Hong Kong-wide 3D pedestrian network as an open-source dataset on 3 December 2020. The spatial dataset in machine-readable formats is now available for preview and download on the Hong Kong GeoData Store. The 3D Pedestrian Network was designed to support navigation services and meet the special needs of people with physical disabilities. It was initially developed by FoA, HKU. Dean Chris Webster, Dr. Guibo Sun, Mr. Alain Chiaradia and many others were involved in the project, which received the Walk21 Hong Kong City Tech Award in 2016. Chiaradia has also developed an advanced version for Central that includes details of the 3D indoor publicly accessible pedestrian network from Sheung Wan to Wan Chai.

  Press release by HKSAR Government:
  https://www.info.gov.hk/gia/general/202012/03/P2020120300289.htm

  The Transport Department's HKeMobility mobile app has adopted the above Network to enrich mobility information.
  https://urbandatapalette.com/post/2020-12-3dpn-quick-look

  Hong Kong GeoData Store: https://geodata.gov.hk/gs/view-dataset?uuid=201eaaee-47d6-42d0-ac81-19a430f63952&sidx=0

  The release was announced in the CE's 2020 Policy Address and Policy Address Supplement, on p. 12:
  https://www.devb.gov.hk/filemanager/en/content_1221/Panel_Paper_2020_(Eng).pdf

  Media coverage
  https://www.news.gov.hk/eng/2020/12/20201203/20201203_120955_725.html

  https://www.thestandard.com.hk/section-news/section/4/225379/Mobility-app-gets-3D-map-support-upgrade

  https://medium.com/@khwongk12/3d-pedestrian-network-dataset-of-hong-kong-a-quick-look-e7d8a7e4fabc

  https://urbandatapalette.com/post/2020-12-3dpn-quick-look

2. Alain Chiaradia

- presented a conference paper at the 14th International Association for China Planning Annual Conference, 5-13 December 2020, Shenzhen, Online *Session 3.11, Transport Planning and Modelling (I)*: Zhou, Y., Zhang, L., **Chiaradia, A.**, SEM-ANN, "An Adaptation of Reference Class Forecasting for the Assessment of Large-scale Urban Planning Vision." 9 December 2020.

- was invited to deliver an online presentation at the 14th International Association for China Planning Annual Conference, 5-13 December 2020, Shenzhen, Online *Special Session VIII B: The Space Syntax of Good Urban Life*: **Chiaradia, A.**, KahKhar, S., Zhang, L., "Challenges in Good Urban Life: High Density City and Volumetric Urban Design, Liveability and Wellbeing." 11 December 2020.

- co-authored a conference paper which was presented by Dr. You Zhou at the 14th International Association for China Planning Annual Conference, 5-13 December 2020, Shenzhen, Online *Session 4.24 MIT Sustainable Urbanization Lab Sponsored Session: Urban Innovation and Economic Development*: Zhou, Y., Zhang, L., **Chiaradia, A.**, "Estimating Wider Economic Impacts of Transport Infrastructure Investment – Ex-post Analysis of Accessibility Change in Hong Kong, the TOD city." 9 December 2020.

- shared his research in progress with Swire Properties Limited on incentive planning and the evaluation of POPS publicness in volumetric urban design on 9 December 2020.

3. Professor Shenjing He

- has been invited to give the following talks:

  • "Urban China Research: From 1.0 to 2.0", School of Resource and Environmental Sciences, Wuhan University, 27 November 2020.
  • "Rethinking Enclave Urbanism in China", Manchester Urban Institute, University of Manchester, UK, 2 December 2020.
  • "Rethinking Enclave Urbanism in China", Mansueto Institute for Urban Innovation, University of Chicago, USA, 9 December 2020.

4. Dr. Derrick Ho

- published the following paper:

  Shudi Zuo, Lianping Yang, Panfeng Dou, **Hung Chak Ho**, Shaoqing Dai, Wenjun Ma, Yin Ren, Cunrui Huang (2021). The direct and interactive impacts of hydrological factors on bacillary dysentery across different geographical regions in central China. <u>Science of the Total Environment</u>, 764, 144609, ISSN 0048-9697. DOI: https://doi.org/10.1016/j.scitotenv.2020.144609

Abstract: *Previous studies found non-linear mutual interactions among hydrometeorological factors on diarrheal disease. However, the complex interactions of the hydrometeorological, topographical and human activity factors need to be further explored. This study aimed to reveal how hydrological and other factors jointly influence bacillary dysentery in different geographical regions. Using Anhui Province in China, consisted of Huaibei plain, Jianghuai hilly and Wannan mountainous regions, we integrated multi-source data (6 meteorological, 3 hydrological, 2 topographic, and 9 socioeconomic variables) to explore the direct and interactive relationship between hydrological factors (quick flow, baseflow and local recharge) and other factors by combining the ecosystem model InVEST with spatial statistical analysis. The results showed hydrological factors had significant impact powers (q = 0.444 [Huaibei plain] for local recharge, 0.412 [Jianghuai hilly region] and 0.891 [Wannan mountainous region] for quick flow, respectively) on bacillary dysentery in different regions, but lost powers at provincial level. Land use and soil properties have created significant interactions with hydrological factors across Anhui province. Particularly, percentage of farmland in Anhui province can influence quick flow across Jianghuai, Wannan regions and the whole province, and it also has significant interactions with the baseflow and local recharge across the plain as well as the whole province. Percentage of urban areas had interactions with baseflow and local recharge in Jianghuai and Wannan regions. Additionally, baseflow and local recharge could be interacted with meteorological factors (e.g. temperature and wind speed), while these interactions varied in different regions. In conclusion, it was evident that hydrological factors had significant impacts on bacillary dysentery, and also interacted significantly with meteorological and socioeconomic factors. This study applying ecosystem model and spatial analysis helped reveal the complex and nonlinear transmission of bacillary dysentery in different geographical regions, supporting the development of precise public health interventions with consideration of hydrological factors.*

5. Professor Bo-sin Tang

- served as discussant of a presentation in the CIURG Webinar Series, by Professor L.Y. Shen, Distinguished Professor, School of Management Science and Real Estate, and Director of International Research Centre for Sustainable Built Environment, Chongqing University, on "A Carrier-load Perspective on Urban Resource Carrying Capacity" on 23 December 2020.

6. Dr. Jianting Zhao, Dr. Guibo Sun and Dean Webster

- published the following paper:

    Zhao, J., Sun, G., & **Webster, C.** (2020). Walkability scoring: Why and how does a three-dimensional pedestrian network matter? Environment and Planning B: Urban Analytics and City Science.
    DOI: https://doi.org/10.1177/2399808320977871

    Abstract: Previous walkability scoring systems are all based on road networks, even though roads are not designed for pedestrians. To calculate an accurate walking score, we need pedestrian network data. This is especially the case in cities such as Hong Kong, where pedestrians are separated from vehicles by footbridges, underpasses or surface sidewalks. In this paper, we investigate why and how a three-dimensional pedestrian network makes a difference in walkability scoring, using Hong Kong as a case city. We developed a walkability scoring system based on networks and amenities, using multiple open-source programming platforms and languages. Separately, we calculated walkability scores (on a scale of 0–100) using the three-dimensional pedestrian network and road network of the city, comparing the differences between the two. A GIS raster analysis was conducted to extract walkability scoring differences from the two walkability surfaces, followed by a univariate linear model to examine how the scores were underestimated if without using the three-dimensional pedestrian network.

Results show that streets were considered twice as walkable if rated by pedestrian networks rather than road networks. Walkability scores were 92% higher on average. The fitted model shows that the mean score underestimations were significantly different for different three-dimensional network elements. Surface sidewalks had an average underestimation of 33.75 ($p < 0.001$), footbridges and underground paths expanded the underestimations by 3.85 and 2.97 (both $p < 0.001$), respectively, and the linkages to footbridge and underground path enlarged the surface sidewalk underestimations by 2.68 and 4.92 (both $p < 0.001$). We suggest that walkability evaluation systems should be developed on pedestrian networks instead of road networks, especially for high-density cities.

7. Dr. Kyungmin Nam and Dean Webster

-   published the following paper:

Wang Yue, Winchester Niven, **Webster Christopher J.**, **Nam Kyung-Min** (2020). Impacts of China's Emissions Trading Scheme on the National and Hong Kong Economies: A Dynamic Computable General Equilibrium Analysis, <u>Frontiers in Environmental Science</u>, Volume 8, pp 268, ISSN 2296-665X. DOI: https://doi.org/10.3389/fenvs.2020.599231

Abstract*: In this study, we estimate the economic impacts of China's official carbon-mitigation targets, in connection with Hong Kong's potential participation in a proposed national emissions trading scheme. We find that moderate intensity-reduction targets emulating China's pledged Paris Agreement commitment would incur much larger policy-compliance costs in Hong Kong (0.1–2.5% of baseline gross domestic product) than in Mainland China (0.1–0.7%) in each of the modelled years from 2021 to 2030 when each economy operates its own independent carbon market. By comparison, an integrated carbon market enables Hong Kong to achieve the same reduction goal at up to 78% lower costs compared to an independent market, and this is achieved without significantly affecting the Mainland's economy. These savings in compliance costs for Hong Kong are greater when pre-integration local carbon prices in both economies are subject to a larger gap. Effectively, the cheaper pre-integration carbon prices in the Mainland indirectly subsidize the Hong Kong economy in the initial years of the integration scenario, buffering the policy shock. In sum, an integrated carbon market in China would improve overall efficiency at the national level, but the benefits are biased toward Hong Kong. This finding suggests that it is in the city's interest to play a more active role in cross-border collaboration on climate mitigation and emissions trading. JEL classification: C68, Q42, Q52, Q54*

iLab

1. ITF funding

- iLab has been awarded a funding from ITF to support the following project:
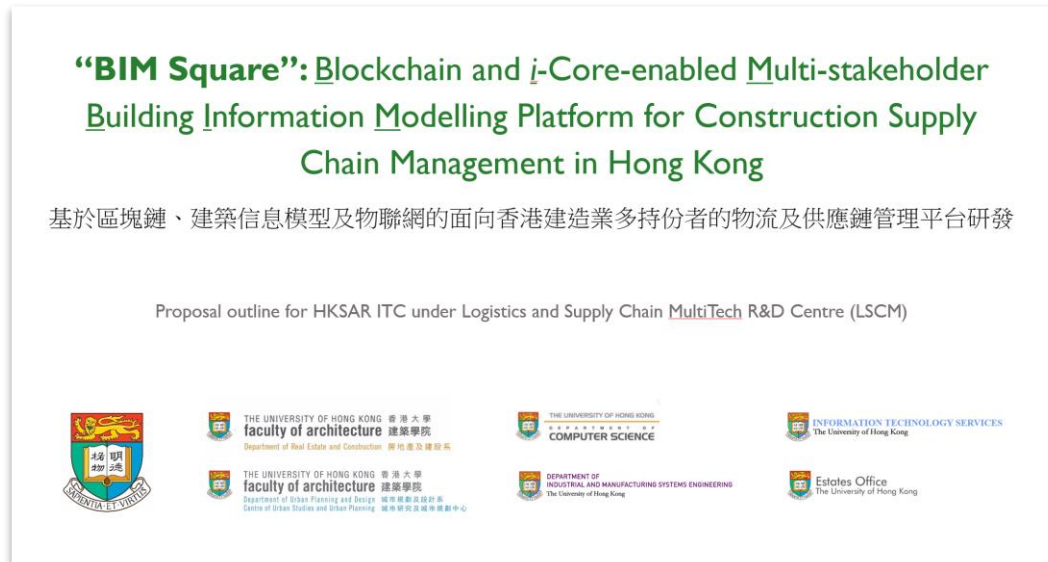
Project title: "BIM Square": Blockchain and i-Core-enabled Multi-stakeholder Building Information Modelling Platform for Construction Logistics and Supply Chain Management in Hong Kong

Project No.: ITP/029/20LP
Project sum: HK$ 10,360,714.25
ITF's funding: HK$ 7,275,009.25
Industry's sponsorship: HK$ 3,085,705.00
PC: Professor Wilson Lu, REC
Co-PIs:
1. Professor Anthony Yeh, DUPAD
2. Professor S.M. Yiu, Department of Computer Science
3. Ir. K.L. Tam, Estates Office
4. Professor George G.Q. Huang, Department of Industrial and Manufacturing Systems Engineering
5. Dr. Fan Xue, REC

Leading Applicant: Logistics and Supply Chain MultiTech R&D Centre Limited

Abstract: The importance of construction logistics and supply chain management (CLSCM) cannot be overemphasized. In Hong Kong, every piece of logistics, be it loose material, precast component, or MiC unit, must be sourced from outside suppliers and brought back to Hong Kong for on-site assembly. The construction industry, its LSCM sector in particular, has developed a world-renowned reputation, but persistent quality problems

related to quality assurance, provenance, traceability, compliance, and efficiency also warrant an acute need to explore the blockchain technology. The project is proposed by a group of applicants who have established their R&D strengths in construction, LSCM, BIM, IoT, and blockchain, respectively. They are now synergizing the strengths to develop a Blockchain and i-Core-enabled Building Information Model Platform for multi-stakeholders to tackle the persistent CLSCM problems better. The innovations of this platform lie in three aspects: (a) Novel blockchain BIM; (b) In-house developed IoT (i.e., i-Core) "hardware oracles" to initiate accountable blockchain BIM at source; and (c) blockchain BIM-enabled process management and quality assurance applications. The project will help Hong Kong to strengthen its CLSCM sector by continuously devising innovations and technologies.

2. Meeting with UniStrong Topsci HK Limited

- iLab, Professor Anthony Yeh, and Ir. K. L. Tam met with the representatives from UniStrong Topsci HK Ltd. on 24 November 2020, to explore Beidou, locationing, and 5G technologies in their ITF projects for smart construction.

3. Meeting with Hong Kong Construction Industry Council

- iLab members, Professor Wilson Lu, Dr. Fan Xue, and Dr. Shell Li met with representatives from the Hong Kong Construction Industry Council on 26 November 2020, to update their ITF-funded project on BIM and blockchain, and to explore opportunities for long-term support from the Council.

4. Hong Kong Science and Technology Parks Incubation & Acceleration Programme

- iLab members met with representatives from Hong Kong Science and Technology Parks on 23 November 2020, to discuss their Incubation & Acceleration Programme, and to explore technology transfer and entrepreneurship opportunities.

5. Professor Wilson Lu

- Gave a talk to Tongji University on 14 December 2020, to introduce the Faculty of Architecture and the research conducted by iLab:

- Best paper awards of the 25ᵗʰ International Symposium on Advancement of Construction Management and Real Estate (CRIOCM 2020)

A team of iLab colleagues participated in the CRIOCM 2020, conducted online (due to the outbreak of COVID-19) from 28-29 November 2020, in Wuhan, China. As the President of CRIOCM, Professor Wilson Lu was invited to deliver the opening speech. Professor Lu expressed his sincerest gratitude to the organizer of this symposium, i.e. the College of Public Administration of the Central China Normal University. Special thanks were also extended to the keynote speakers, especially those from overseas countries, who had accepted the invitation despite their busy schedules and time differences.

Among the 11 members of iLab who had submitted their conference papers and delivered the oral presentations at the symposium (see the table below), 7 of them were awarded either the Best Paper, the Outstanding Paper, or the Merit Paper Awards. The papers were anonymously reviewed and the winners were rigorously selected from over 150 accepted manuscripts in two rounds, based on their academic merits. The two-day conference had brought iLab colleagues a fruitful knowledge exchange experience with renowned scholars and students from various universities around the globe.

	Authors (Presenter in bold)	Title	Notes
1	**Vikrom Laovisutthichai,** Weisheng Lu, Fan Xue	Modular Construction: Design Considerations and Opportunities	Outstanding Paper Award
2	**Hui Guo,** Weisheng Lu	How do Chinese International Construction Companies View Corporate Social Responsibility?	
3	**Wendy M. W. Lee,** Weisheng Lu, Fan Xue	Understanding Construction Waste Recycling in Hong Kong: SWOT Analysis of the Government's Prevailing Initiatives	Merit Paper Award
4	**Jinying Xu,** Weisheng Lu	The Iron Triangle of BIM Adoption in Construction Project Organizations	Outstanding Paper Award
5	**Liupengfei Wu**, Weisheng Lu, Fan Xue	Construction Inspection Information Management with Consortium Blockchain	Merit Paper Award
6	**Maosu Li,** Fan Xue, Anthony G.O. Yeh, Weisheng Lu	Classification of Photo-realistic 3D Window Views in a High-density City: The Case of Hong Kong	Outstanding Paper Award
7	**Liang Yuan**, Weisheng Lu	Research on the Critical Obstacles to the Application of BIM in the Existing Buildings in China	
8	**Jing Zhang,** Maosu Li, Wenjing Zhang, Yijie Wu, Fan Xue	Prospect of Architectonic Grammar Reconstruction from Dense 3D Point Clouds: Historical Building Information Modeling (HBIM) of Guangdong Cultural Heritage	Merit Paper Award

|	Authors (Presenter in bold)	Title	Notes
9	**Jing Wang,** Weisheng Lu	The Roles of Inter-organizational Networks in BIM Localization	
10	**Jinfeng Lou,** Weisheng Lu, Fan Xue	A Review of BIM Data Exchange Method in BIM Collaboration	
11	Clyde Zhengdao Li, **Zhe Chen**, Yiyu Zhao, Xulu Lai	A Systematic Design Approach for the Innovation of Supply Chain Resilience of Prefabrication	Best Paper Award

Paper awards received by iLab team members

Social Infrastructure for Equity and Wellbeing

1. Seminar Series

- Professor Shenjing He reported the following seminars conducted by the SIEW Lab:

    (i) On 28 August 2020, SIEW Lab hosted the inaugural Lab seminar via Zoom. Lab members Dr Jin Zhu, Mr. Xiang Yan and Miss Lirong Hu introduced their recent research. More than 50 scholars and students attended the seminar, including our Lab board members: Professor Fulong Wu (UCL), Professor Manuel Aalbers (KU Leuven), Professor Hal Pawson and Professor Bingqin Li (UNSW), Professor Junyi Zhang (Hiroshima), Professor Xiaogang Wu (HKUST), A/Prof. Linwei Tian (HKU Public Health) and Dr. Dan Wang (HKU Education).
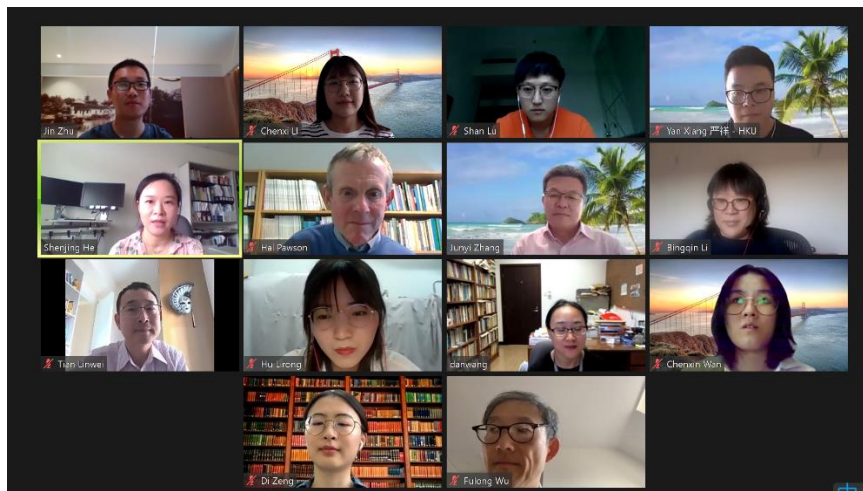
    (ii) On 19 September 2020, SIEW Lab hosted the second Lab seminar. Lab member Mr. Lu Shan presented his current research on Airbnb and Miss Rong Cai introduced her PhD thesis on neighbourhood governance in urban China. This is an internal seminar and all Lab members attended.
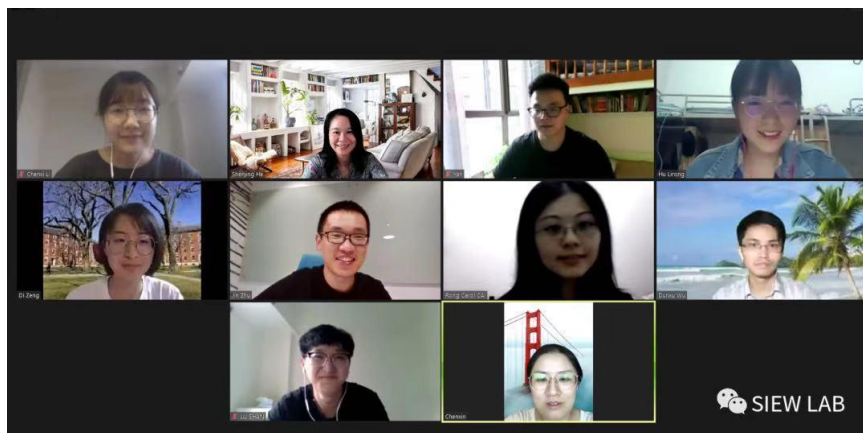
(iii) On 20 October 2020, SIEW Lab hosted the third Lab seminar. SIEW Lab board members A/Prof. Linwei Tian (HKU Public Health), Professor Junyi Zhang (Hiroshima) and his PhD student Shuangjin Li shared their research on 'Indoor Coal Smoke and Lung Cancer' and 'How was the Early Spread of COVID-19 Associated with the Built Environment' respectively. The seminar was held through Zoom and Bilibili. Nearly 2,900 scholars and students participated in this event.

(iv) On 26 November 2020, SIEW Lab hosted the fourth Lab seminar on the theme of Housing Financialisation. Professor Manuel Aalbers (KU Leuven) first introduced the concept and evolution of housing financialisation, and then Professor Fulong Wu (UCL) elaborated housing financialisation from a Chinese perspective. More than 3,000 people attended this event through Zoom and Bilibili.

(v) On 20 December 2020, SIEW Lab hosted the fifth Lab seminar on the theme of Environment and Health. A/Prof Linwei Tian (HKU Public Health), Professor Junyi Zhang (Hiroshima) and his PhD student Shuangjin Li shared their research on 'Ambient Air Pollution and Health in Hong Kong' and 'Research for Japan Data Health Plan: Case Studies on the Role of the Built Environment and Prediction of Health Risks'. More than 700 scholars and students participated in this event through Zoom and Bilibili.
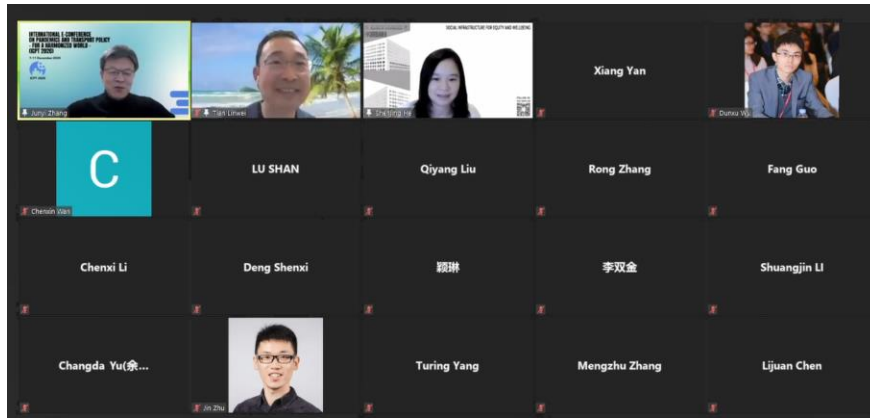
2. Publications

- Professor Shenjing He reported the following papers published by the SIEW Lab:

(i) **He, S.**, & Chang, Y. (2020). A zone of exception? Interrogating the hybrid housing regime and nested enclaves in China-Singapore Suzhou-Industrial-Park. Housing Studies, 1-25.

Abstract: Focusing on the highly 'successful' China-Singapore Suzhou Industrial Park (SIP), this study taps into a less explored topic of housing development in Special Economic Zones (SEZs) through the conceptual lenses of housing regime and enclave urbanism. Drawing on empirical evidence garnered from interviews, survey, observation, and secondary sources, this study transcends methodological nationalism and cityism to present a situated and close-up examination of housing regime at the intra-urban level. It also enriches the concept of enclave urbanism by delving into the nested enclave structure in SIP. A hybrid housing regime featuring a (neo)liberal logic in the disguise of the semi-social democratic regime for landless farmers and a productivist regime for the variegated workforce is identified. Two key players – the local state and transnational corporations, via formal and informal institutions, gave rise to a nested enclave structure. Instead of 'a zone of exception', SIP epitomises the ubiquitous neoliberalisation and aggravated precarity endured by low-skilled migrants, and foregrounds housing stratification and segregation within SEZs.

(ii) **Su, S.**, Zhang, J., **He, S.**, Zhang, H., **Hu, L.**, & Kang, M (2021). Unraveling the impact of TOD on housing rental prices and implications on spatial planning: A comparative analysis of five Chinese megacities. Habitat International, 107, 102309. ISSN 0197-3975.
DOI: https://doi.org/10.1016/j.habitatint.2020.102309

Abstract: Transit Oriented Development (TOD), as a widely practiced planning strategy toward urban sustainability, commonly refers to the integration of transport and land use in the form of an integrated transit station

area surrounded by compact urban development and high-quality walkable environment. Although policymakers are very enthusiastic about the potential of TOD in boosting the development of real estate market and livable neighborhoods, how TOD characteristics affect housing rental prices has not well been gauged with empirical data. Taking advantage of online housing platforms, this paper attempts to fill this gap through explicitly unraveling the impact of TOD on housing rental prices across five major Chinese megacities (Beijing, Shanghai, Shenzhen, Hangzhou and Wuhan). We first propose a conceptual framework to explain why and how TOD impacts housing rental prices. TODs are then delineated in the five megacities and T-test confirms that TOD housing properties present significant higher rental prices than non-TOD ones. Spatial hedonic modeling is employed to identify the relationship between TOD characteristics (e.g., metro station, neighborhood and synergy) and housing rental prices in each megacity, and the variable decomposition is further utilized to quantify their relative contribution. Regardless the variations among the five megacities, it is discovered that TOD characteristics generally account for 10%–20% of the housing rental prices and the TOD neighborhood presents the highest relative contribution. The synergy between the metro station and the neighborhood also plays an essential role. Metro station type rather than metro station proximity acts as a significant exploratory variable. These findings foreground that the essence of TOD lies in high-quality urban (neighborhood) development, which are often overlooked in previous studies that overemphasize the importance of "transit" (station) itself. Based on the identified TOD-generated housing rental premiums, we offer five recommendations for TOD practices to be integrated into China's territorial spatial planning. This study renews our understanding of the outcomes of TOD both conceptually and methodologically.

(iii) **Yan, X.**, & **He, S.** (2020). The co-evolution of therapeutic landscape and health tourism in bama longevity villages, China: An actor-network perspective. <u>Health & Place</u>, 66, 102448, ISSN 1353-8292. DOI: https://doi.org/10.1016/j.healthplace.2020.102448

Abstract*: Many locales featuring therapeutic landscapes have seen a rise in health tourism in recent years. This study introduces an actor-network perspective to examine the co-evolution of therapeutic landscapes and health tourism, and its inherent dynamism. We argue that therapeutic landscapes and health tourism are emerging out of an integrated actor-network, and thus are in continuous processes of (re)ordering and co-evolution. We also propose a typology of dynamics for the study of such an actor-network, substantiated with an empirical study of the Bama longevity villages in China, in which four interrelated and cascaded dynamics are closely scrutinized: tourists as part of the therapeutic landscape; tourism's impact on the landscape; the heterogeneous therapeutic perceptions of tourists; and the extension of the therapeutic network by health tourism. This study contributes to the relational thinking of therapeutic landscapes and health tourism, and enriches the understanding of their interlacing dynamics from the vantage point of the tourismscape.*

(iv) Li, Z., **He, S.**, Su, S., Li, G., & Chen, F. (2020). Public services equalization in urbanizing China: Indicators, spatiotemporal dynamics and implications on regional economic disparities. <u>Social Indicators Research</u>, 152(1), 1-65. DOI: https://doi.org/10.1007/s11205-020-02405-9

Abstract: Public services equalization is closely related to local economic and social development. Hence, it is crucial to explore the changing dynamics of public services equalization and its correlation with regional economic disparities. We first examine the changing spatiotemporal patterns of public services provision and local economic performance at the provincial level across China from 2003 to 2017, using a set of indicators and the Mann–Kendall test. It is found that different types of public services are divergent in both temporal trend and geographical locations. However, both income and expenditure have been significantly increased for all provinces during the study period. Second, we unravel the heterogeneous relationship between public services provision and local economy across time and space using the geographically and temporally weighted regression. Variance decomposition is further employed to quantify the relative contribution of public services provision to local economy. Results show that the impact of different types of public services on local economic system is divergent, which jointly affects the local economy system together with political and other economic factors. Thirdly, we use the Theil index and traditional least square regression to further examine the relationships between public services equalization and regional economic disparities. We find that public services equalization is correlated with regional economic disparities at the national level, yet their interrelation varies significantly in different regions. Taken together, through revisiting the role of public services equalization in regional economic disparities and unpacking its geographical and temporal heterogeneity, this study fills salient research gaps and informs policymaking towards a long-term goal of social equalization.

(v) **Huang, Y.**, **He, S.**, & Gan, L. (2020). Introduction to SI: Homeownership and housing divide in China. <u>Cities</u>, 108, 102967.
DOI: https://doi.org/10.1016/j.cities.2020.102967

(vi) Zhang, M., & **He, S.** (2020). Who feels secure in customary tenure and why? A triangular framework of perceived tenure security in China's small property right housing. <u>Cities</u>, 107, 102900, ISSN 0264-2751.
DOI: https://doi.org/10.1016/j.cities.2020.102900

Abstract: Customary tenure is inherent to the informal urbanisation process and institutional ambiguity in the developing world. However, factors that influence perceived tenure security remain poorly understood. We develop an analytical framework to understand the constitutive and heterogeneous nature of perceived tenure security. We employ social capital theory to explicate the individualised perception of exogenous threats. Focusing on China's small property right housing (SPRH), we examine the proposed

conceptual framework and uncover the heterogeneous formation of perceived tenure security, which is shaped by homeowners' structural social capital that decides their capability of seeking backing power against external threats from the state and the village. Our hypotheses are substantiated by an analysis of empirical data collected from a household survey and ethnographic investigations in Beijing. Results show that homeowners with adequate structural social capital, namely, local buyers, those working in the public sector and more embedded in the community social network, tend to perceive a higher degree of security in their tenure. The inconsistent effects of villages' acquisition of political patronage for customary tenure on homeowners' perceived security suggest a triangular rivalry among the state, village and homeowners on the land rent of SPRH.

(vii) Zhang, M., & **He, S.** (2020). From dissensus to consensus: State rescaling and modalities of power under the Belt and Road Initiative in western China. <u>Annals of the American Association of Geographers</u>, 1-20, ISSN 2469-4452. DOI: <u>https://doi.org/10.1080/24694452.2020.1823808</u>

Abstract: *Under the Belt and Road Initiative, a new city-regionalism has replaced the independent county system in western China to form a new accumulation regime. Drawing on empirical materials related to the annexation of Guanghan to Deyang, this study delves into three research questions: (1) how a new accumulation regime is enabled by a new state spatial selectivity in western China; (2) how the changing opportunity structure as a result of the upscaling of state power from county to city induced opposition from the local society; and (3) how the local state tactically dissolved the dissents to facilitate the state rescaling process. Methodologically, we present a multiscalar and interscalar analytical framework that links scholarly inquiries at multiple scales. Theoretically, through bringing together the territory–place–scale–network approach and the poststructural theory of state power, we reconceptualize state rescaling as a multidimensional process of (re)organizing and manipulating sociospatial relations to enable crisis management and as a power-laden process that relies on state power exercised to construct compliance or consensus and address dissensus. Empirically, this study substantiates the explanatory power of rescaling theories in both temporal and spatial dimensions by presenting a vivid vignette of crisis-driven state rescaling in western China. It also adds to the proliferating debates on the Belt and Road Initiative through offering a new perspective and updated evidence on the reorientation of China's interior political, economic, and social systems via a rescaling fix.*

(viii) Zhang, M., & **He, S.** (2020). Informal property rights as relational and functional: Unravelling the relational contract in China's informal housing market. <u>International Journal of Urban and Regional Research</u>, 44(6), 967-988. DOI: <u>https://doi.org/10.1111/1468-2427.12927</u>

Abstract: *In the face of state-led land grabs, enterprising Chinese peasants have started a revolution in the ambiguous and insecure rural tenure system by developing an extralegal property system known as the small property right (SPR). Using the SPR, peasants are able to capitalize on their property through the sale of houses built on collectively owned land. Little is known, however, about the specific process behind the development of the SPR by the peasants, or how this extralegal property system functions in terms of securing the use and transfer of property without the backing of law. This article aims to clarify the situation through the lenses of the Endogenous Nature of Institutions and Relational Contract Theory, aiming to understand the socially constructed, endogenous and relational nature of the property rights that make SPR functional. Based on an ethnographic investigation of Beijing's largest SPR housing settlement, we show how enterprising peasants develop long-term relational contracts with urban households for the provision of housing services, secured on the basis of the common interests and symbiosis of the two parties and a reputation system that serves to deter defaults. The discretionary treatment of SPR housing by local states serves as a further motivation for the village and the informal homeowners to preserve a stable property arrangement, with such a specific institutional setting being an exemplar of China's pragmatic state entrepreneurialism.*

3. Project

- The following project by Dr. Jin Zhu and Professor Shenjing He has been awarded funding support from Shanghai Social Science Grant: