THE UNIVERSITY OF HONG KONG 香港大學
faculty of architecture 建築學院
HKURBAN labs

Sustainable High Density Cities Lab

Biannual Newsletter 2018–19

香港大學高密度可持續城市實驗室 2018 -19 雙年簡報

Sustainable High Density Cities Lab
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http://www.arch.hku.hk/researchcentre/sustainable-high-density-cities-lab/

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1.Introduction to Sustainable High Density Cities

Sustainable High Density Cities Lab (SHDC) is a multi-disciplinary research establishment within the HKUrban Lab, Faculty of Architecture, The University of Hong Kong. The mission of SHDC is dedicated to research in multi-scale environmental modelling and built-environmental sciences that advance sustainable planning and design practices. Multi-scale means building-interiors, single buildings, clusters of buildings, spaces between buildings, up to the entire city envelope, mega-city regions and systems of cities. The group has projects to evaluate the environmental driving factors of urban form, i.e. health and comfort, building energy, urban heat island, etc. SHDC develop software tools to evaluate environmental exposure of occupants, energy performance, carbon emissions and link the driving factors to the outcome measures of human health and wellbeing. The team engage professionals and policy-makers in order to extend impact of research outcomes. Since its establishment in 2016, SHDC is part of a world-class network of building / architectural / environment / urban science, research labs in National University of Singapore, Cardiff University, Tianjin University, Tsinghua University, Tongji University, University College London, Chinese University of Hong Kong, University of Chicago and Cambridge University.

2. Research Projects

Government policies are promoting sustainable, low-carbon development agenda, while a large proportion of urban planning and design practices are yet to respond. Business as usual is no longer an option, but the industry needs new thinking and tools in order to drive bottom-up innovations. Researchers from the Sustainable High Density Cities Lab of the HKUrban Lab from the University of Hong Kong work with practitioners in order to improve urban environment performances and quality of lives. Our on-going works demonstrate the following pathways through which digital technologies can **EMPOWER** urban planning and design professionals and advance human-centric values.

- **E**valuate planning and design performance
- **M**easure environmental exposure and health
- **P**rotect communities against climate change
- **O**ptimize design schemes
- **W**eb-based mapping of urban dynamics
- **E**nvision low-carbon high-density future
- **R**eflect on classic theories

The following research projects are highlighted in Newsletter 2018-19

2.1. UrBEC: A Simulation Tool for Urban Building Energy and Climate

Jianxiang Huang[1], Phil Jones[2], Rong Peng[1], Anqi Zhang[1], Yiming Sun[1], Pak Wai Chan[3]
[1] Department of Urban Planning and Design, Faculty of Architecture, The University of Hong Kong
[2] Welsh School of Architecture, Cardiff University, UK
[3] The Hong Kong Observatory

Abstract The motivation for UrBEC arose from a need to extend performance-based assessment from single buildings to urban scale. Research into urban modelling at the SHDC began in 2015. The main research aim was to solve the energy and mass exchanges between buildings and the immediate surroundings, allowing coupled simulation of indoor and outdoor conditions at urban-scale, with additional models addressing traffic waste heat, vegetation and ground heat transfer to support analysis of complex urban processes. The research has been evaluated using field measurement and results were published in peer-reviewed journals.
Acknowledgement Faculty of Architecture seed grant, followed by National Natural Science Foundation of China funded research (#51708473).

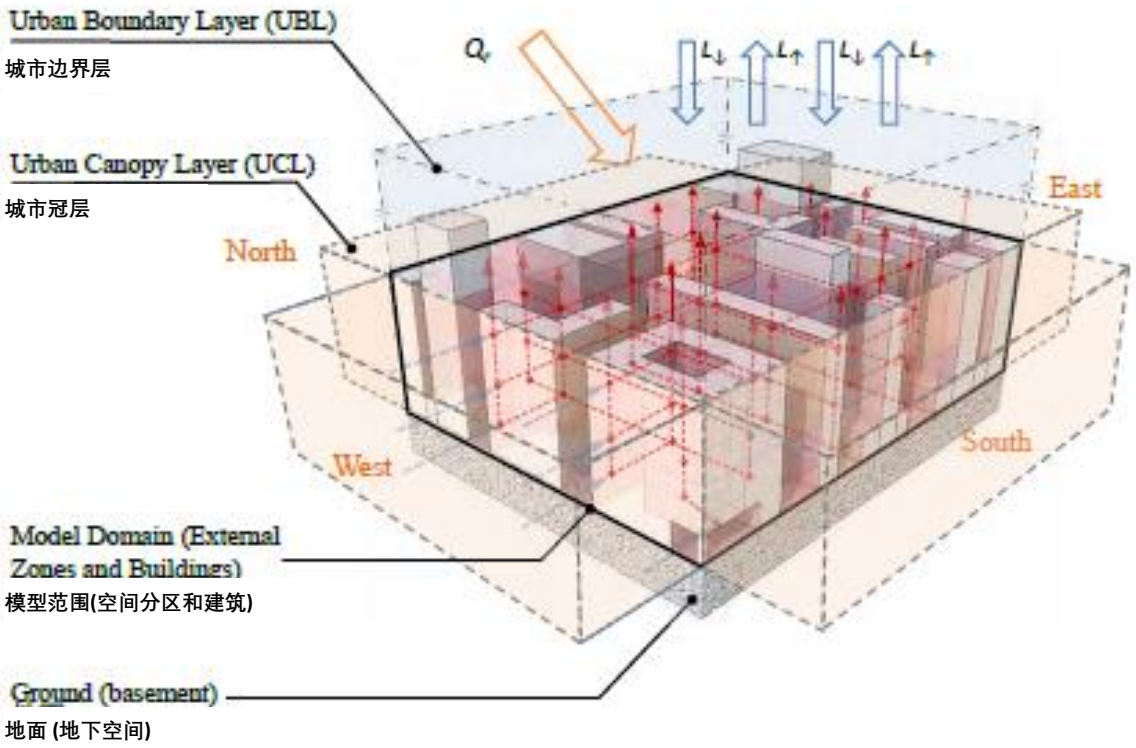


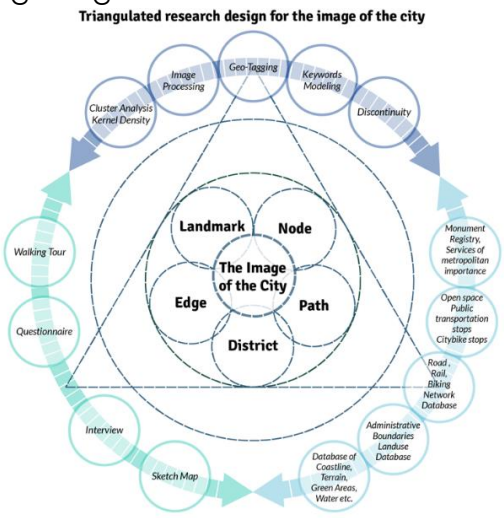
Fig. 1 Schematic depiction of energy and mass exchange between the urban canopy layer and buildings in a high-density city.

2.2. The Image of the City on Social Media: Theoretical Verification and Planning Implication in the Digital Age

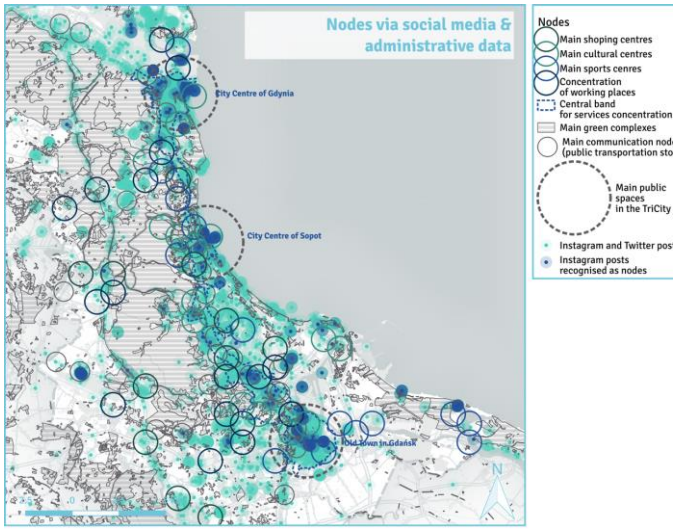
Jianxiang Huang[1], Hanna Prondzynaska[2], Dorota Kamrowska-Zaluska[2], Yiming Sun[1], Lishuai Li[3]
1. Department of Urban Planning and Design, Faculty of Architecture, the University of Hong Kong, Pok Fu Lam Rd., Hong Kong SAR China
2. Department of Urban Planning and Design, Gdansk University of Technology, 11/12 Gabriela Narutowicza Street, 80-233 Gdańsk, Poland
3. Department of System Engineering and Engineering Management, City University of Hong Kong, 83 Tat Chee Ave, Kowloon Tong, Hong Kong SAR China

Abstract *We studied the image of the city using social media data, namely Instagram and Twitter collected from the TriCity Region consisted of Gdansk, Sopot and Gdynia in northern Poland. Text-mining, image processing, clustering analysis, and statistical analysis were used for geo-tagged photos, videos, and text collected for a period of calendar year. Findings are evaluated using GIS database and questionnaires conducted in parallel. Imageability, the frequency of a place captured on photo-based social media, is a strong indicator of positive rating of the place from questionnaires. Social media evidence clearly supported the existence of Landmarks – geo-tagged buildings, Paths - channels of continuous movement, and Districts, continuity of tweets, which correlate strongly with officially designated monuments, major streets and transit corridors, and administrative boundaries of neighbourhoods, while nodes and edges exhibits weak correlation with real-world benchmarks.*

Acknowledgement: The SEED grant from the Faculty of Architecture, the University of Hong Kong.



Evaluation of Kevin Lynch's city image theories using multiple evidence from "big data" and "small data"



Identification of Kevin Lynch's five elements using image processing and machine-learning algorithms using social media data.

2.3. A Spatial Perspective of Noise Complaints: Evidence from Public Nuisance Petition and Social Media data

Mengdi Guo[1], Jianxiang Huang[1], Yiming Sun[1], Lishuai Li[2], Rong Juin Shyu[3]
[1] Department of Urban Planning and Design, Faculty of Architecture, The University of Hong Kong
[2] Department of System Engineering and Engineering Management, City University of Hong Kong
[3] Department of Systems Engineering & Naval Architecture, National Taiwan Ocean University

Abstract Environmental noise is a major source of nuisance and cause of ill health. Previous research indicates that noise incidents in high density cities are associated with urban density, demographics diversity, land use mixture, etc. The availability of "big data" from social media and Public Nuisance Petition (PNP) provided new opportunities to study occupant response towards environmental noise. We studied incidents of noise complaints in the Greater Taipei Area using both geo-tagged tweets (twitter data) and PNPs. Text-mining and machine learning methods were applied to identify sound-related tweets; regression analysis were used to identify the links among twitter activities, PNPs, built environment and socio-demographic attributes. Results show spatial correlation between noise-related tweets and PNP data, both associated with density and other built environment and socio-demographic conditions. Twitter data can serve as a supplementary source for proactive monitoring and prevention of environmental noise hazards in high-density cities.

Acknowledgement We thank the Seed Funding from the Faculty of Architecture, The University of Hong Kong, The Health and Medical Research Fund from the Food and Health Bureau of the Hong Kong Government (HMRF Grant # 13143421), the Hong Kong Research Grants Council Theme-Based Research Scheme under Grant T32-101/15-R, 33rd Round HKUPDF fellowship fund from the University of Hong Kong

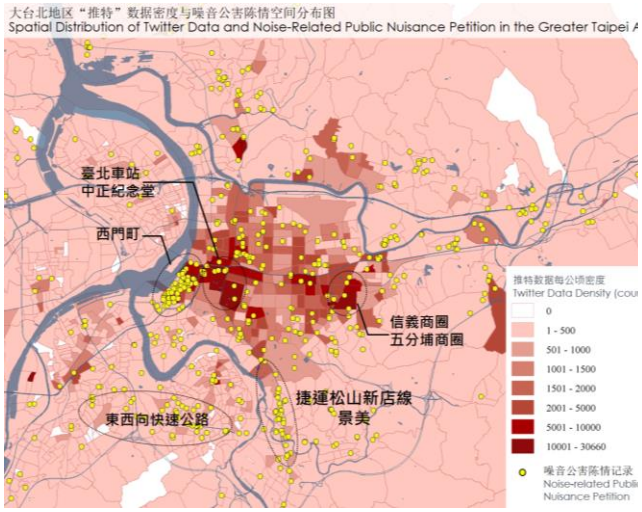


Fig. 2 Spatial Distribution of Twitter Data and Noise-Related Public Nuisance Petition in the Greater Taipei Area

2.4. Spatial analysis of expressed sentiment of geo-tagged social media data and implications for urban planning and design

Jianxiang Huang[1], Yiming Sun[1] , Lishuai Li[2], Yiyang Yang[1], Chris Webster[3]
[1] Department of Urban Planning and Design, Faculty of Architecture, The University of Hong Kong
[2] Department of System Engineering and Engineering Management, City University of Hong Kong
[3] Faculty of Architecture, The University of Hong Kong

Abstract *In this study,* novel evidence of geotagged social media data was used to assess expressed mood and emotional well-being in Hong Kong. *The purpose is to test* whether social media data can measure residents' mood and satisfaction towards living in high-rises? If yes, what can urban planners learn from the new source of evidence? Correlations between expressed sentiment tones and built environment characteristics were examined, while controlling for confounding factors such as demographic, social, and economic variables. *Results show that High population density per hectare is negatively associated with sentiment. Positive sentiment was associated with high-rise buildings, small blocks, and land use mixture.*

Acknowledgement HKUrban Lab Seed Funding of the Faculty of Architecture and the Hong Kong Research Grants Council Theme-Based Research Scheme under Grant T32-101/15-R

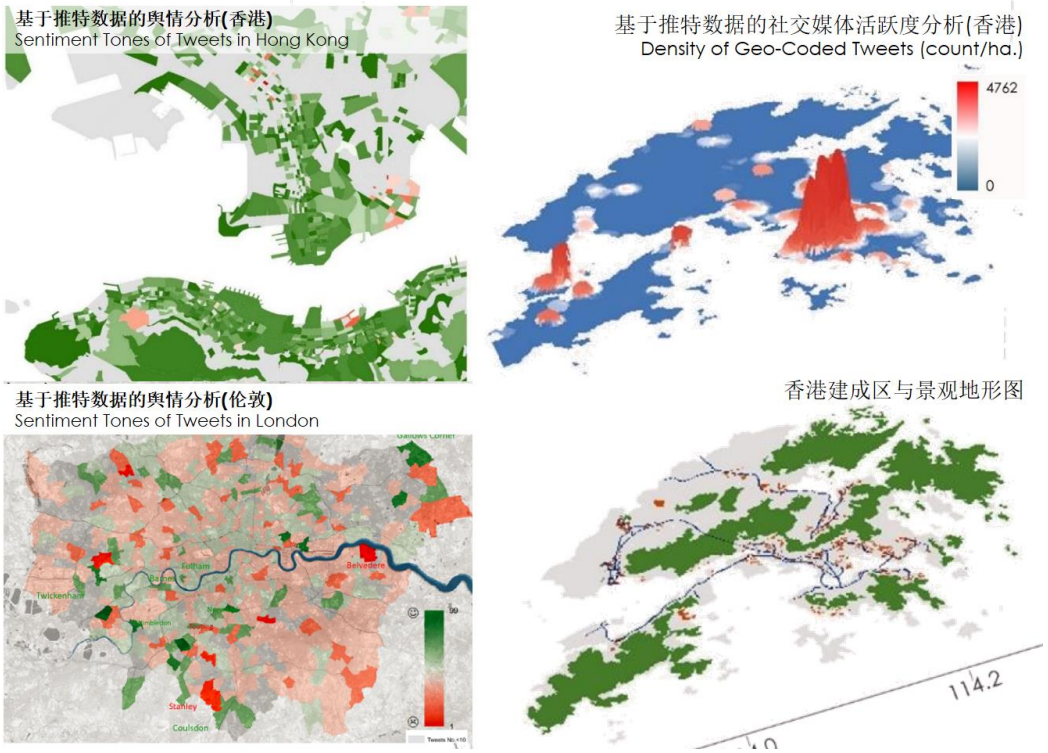


Fig. 3 On-going studies conducted at multiple cities & regions by the Sustainable High Density Cities Lab

2.5. A 3D Database of Traffic Noise Exposure and Mental Health in Hong Kong

Mengdi Guo[1], Jianxiang Huang[1], Michael Ni[2], Chris Webster[3], Gabriel Leung[2]
[1] Department of Urban Planning and Design, Faculty of Architecture, The University of Hong Kong
[2] School of Public Health, Faculty of Medicine, The University of Hong Kong
[3] Faculty of Architecture, The University of Hong Kong

Abstract Researchers from the Sustainable High Density Cities Lab team up with researchers from the University of Hong Kong Li Ka Shing Faculty of Medicine to study the impact of traffic noise exposure on depressive symptoms and mental wellbeing. The team is developing advanced numerical models to assess noise exposure of households at their home addresses, taking into account source profiles and the modifying effect of the local built environment, i.e. multiple noise reflections from building surfaces, attenuation by distance and structural insulation. The study leverages the FAMILY cohort and "Children of 1997" birth cohort, two large population-representative cohorts in Hong Kong. Noise exposure data in the study are linked to health outcomes using a 3D geo-spatial database, providing precise resolution much needed in a high-density city, where the complexity of soundscapes exceed lower density living environments.

Acknowledgement Seed Funding from the Faculty of Architecture, The University of Hong Kong, Small Equipment Grant from the University of Hong Kong, and the Health and Medical Research Fund from the Food and Health Bureau of the Hong Kong Government (HMRF Grant # 13143421)

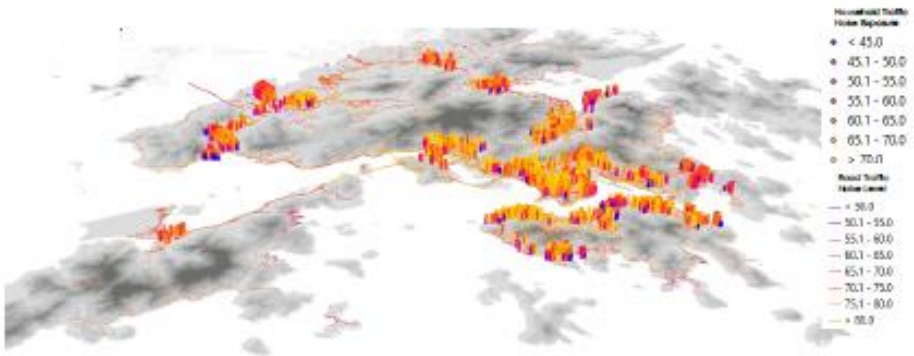


Fig. 4 Predicted Annual Average Household Road Traffic Noise Exposure in Hong Kong N>40,000

Fig. 5 Measuring Road Traffic Noise using Sound Camera in Shek Kip Mei, Hong Kong

2.6. Evaluating Air Pollution Mitigation Measures in Hong Kong

Anqi Zhang[1], Jianxiang Huang[1]
[1] Department of Urban Planning and Design, Faculty of Architecture, The University of Hong Kong

Abstract Traffic-borne air pollution imposes one of the greatest challenges to health in Hong Kong and other post-industrial metropolis. A novel simulation-based method was developed at the Sustainable High Density Cities Lab to assess air pollutant concentration in Hong Kong's high-density street canyons. The model was tested and applied in Sai Ying Pun neighbourhood to test the effectiveness of planning and traffic control measures designed to reduce urban pollutant concentration, such as the introduction of Air Ventilation Corridor, Diesel Commercial Vehicle Replacement programme, design Permeable Blocks, enact Pedestrianization Scheme, promote Electric Vehicle, and setting up of Low Emission Zone, etc. The Diesel Commercial Vehicle Replacement programme, together with the Pedestrianization scheme for Des Voeux Road, appear to be more effective than others. Both are expected to reduce on-site PM_{10} concentration from 55 μg/m^{3}of the existing condition to under 50 μg/m^3, meeting Hong Kong's local standard yet still above those of the WHO standards of 20 μg/m^3. The model can run efficiently and demonstrated potentials to serve as a planning tool.

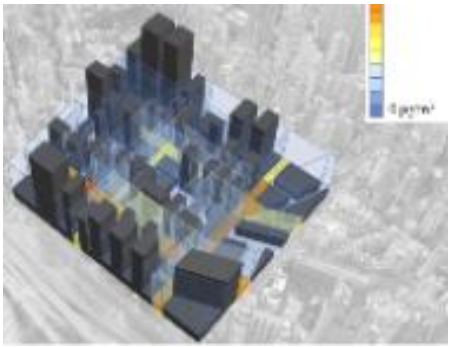


Fig. 6 Computer simulation of 3D air pollution concentration in Sai Ying Pun Hong Kong

Fig. 7 Wind tunnel studies in order to evaluate the simulation model

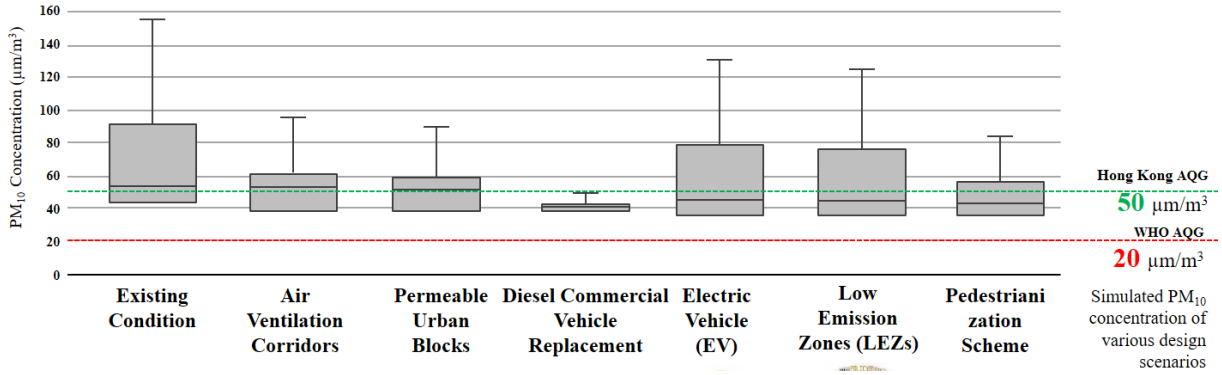


Fig. 8 Simulation of urban planning and transportation management in effectiveness in air pollution mitigation in Sai Ying Pun, Hong Kong

2.7. Simulation-Informed Urban Design: Improving Urban Microclimate in Real-World Practice in a High Density City

Jianxiang Huang[1], Tongping Hao[1], Shan Shan Hou[2], Phil Jones[2]
[1] Department of Urban Planning and Design, Faculty of Architecture, The University of Hong Kong
[2] Welsh School of Architecture, Cardiff University, UK

Abstract Informed evidence based design decisions to mitigate urban heat island becomes a priority for urban planning and design practitioners. The aim of the study is to develop informed design and development decisions using computer simulation tools concerning urban microclimate performance. In this study, academic researchers have worked with industrial partners in an urban renewal project in Hong Kong's high density urban area. In-house developed simulation software such as CityComfort+ and HTB2-Virvil were applied to assess urban microclimate conditions and risks of pedestrian thermal stress throughout key seasons. Simulation results were provided as feedback to project designers and managers at early stage, allowing timely design modification to improve performance while maintaining code compliance and design and fiscal priorities. The procedure is iterative until performance attributes converge. Preliminary results show that the informed design can deliver significant microclimate benefits compared with "business-as-usual scenarios". By shaping building mass, orientation, and strategic placement of shading and vegetation, the improved design is expected to reduce summer-time outdoor heat stress by 1°C measured in UTCI equivalent temperature, thus bringing the average conditions for the hot season into the "comfort zone" for the local community. Energy simulation can predict overall energy demand and the potential for renewable energy supply at an urban scale. The simulation-designer workflow shows promising potentials to improve urban microclimate performance of design outcomes and the potential for zero carbon urban blocks. The early-stage action, forward-looking partnership, and computing efficiency of the simulation tools are the keys.

Acknowledgement Seed funding from the Faculty of Architecture and Hong Kong Urban Renewal Authority research support

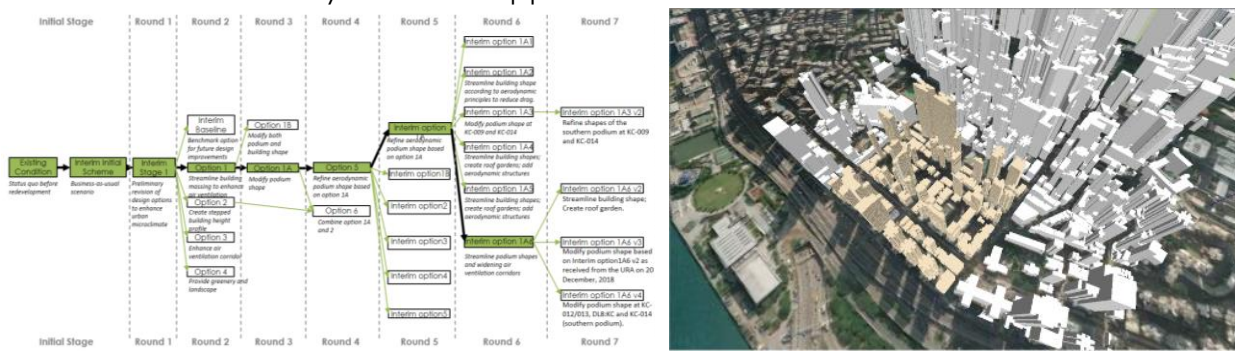


Fig. 9 A roadmap of applying the simulation-design workflow to evaluate and revise design options

2.8. Early-Stage Simulation of building cluster energy performance and on-site renewable energy potentials

Xiaojun Li[1], Jianxiang Huang[2], Phil Jones[1]
[1] Welsh School of Architecture, Cardiff University, UK
[2] Department of Urban Planning and Design, Faculty of Architecture, The University of Hong Kong

Abstract Sustainable design strategies can deliver maximum impact if implemented from early-stages. Research team from the Sustainable High Density Cities Lab collaborated with practitioners at early design stages in real-world projects from the Greater Bay Area. The team used Virvil-HTB2, a software plugin for SketchUp developed at Cardiff University. The model inputs are early-stage 3D urban massing and weather data. Results can indicate energy performance for the building clusters, taking into account the interactions between buildings and the environment. Results are useful for design optimization, identification of energy savings potentials and setting project-specific green building performance standards.

Acknowledgement Architectural Design and Research Institute of SCUT Co., Ltd.

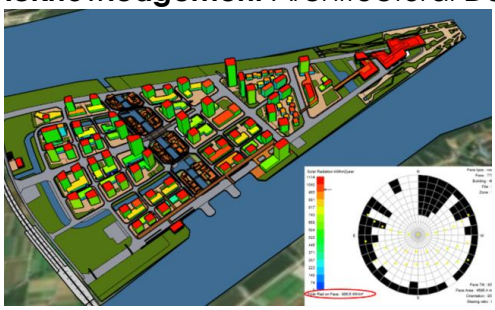


Fig. 10 Simulation of renewable energy potentials of Nansha Pearl Bay urban design project.

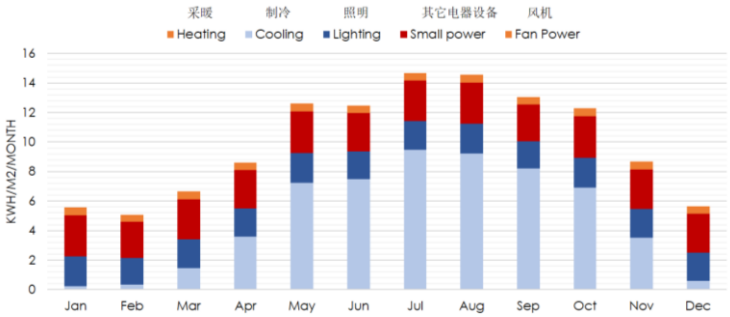


Fig. 11 Predicted monthly energy demand for the building cluster (kWh/m2)

2.9. A Multi-City Study of Thermal Adaptation in Urban Outdoor Spaces Using Data Analytics

Jianxiang Huang[1], Lishuia Li[2], Phil Jones[3], Mengdi Guo[1], Tongping Hao[1], Yiming Sun[1], Anqi Zhang[1]

[1] Department of Urban Planning and Design, Faculty of Architecture, The University of Hong Kong
[2] Department of System Engineering and Engineering Management, The City University of Hong Kong
[3] Welsh School of Architecture, Cardiff University, UK

Abstract: Urban heat arising from both climate change and Urban Heat Island (UHI) effects takes a toll on urban life, affecting activity patterns, quality of life and health of

living in cities. Understanding human perception and behavioural responses to the urban thermal environment is of importance to energy efficient and climate adaptive planning practices. Thermal adaptation of urban residents in outdoor urban space remains inconclusive in existing studies. Most studies rely on observations or field questionnaires (self-reported results); findings are often limited by sample size, study period and sites available. Results may not be generalizable across climate zones, societies and culture. The aim of this study is to develop an analytical framework to measure outdoor activities and thermal adaption in open spaces. We hypothesize that activities and thermal preference uncovered in cyberspace is indicative to the real space. Six major Chinese cities across climate zones with significant social media activities are selected. The project will 1) develop a new analytical framework to monitor the dynamics of human responses to heat stress in open space using social media data, 2) evaluate results from the above framework using traditional methods, i.e. online follow-up survey, field questionnaire, observation, and measurement of microclimate attributes, and 3) analyse the relationship between thermal-related topics posted on social media and the user's in-situ thermal exposure calculated from urban microclimate models. A pilot study was conducted in Hong Kong using 302,633 Twitter data collected from May. 2016 to Jan. 2017.

Acknowledgement HKUrban Lab Seed Funding of the Faculty of Architecture, Hong Kong Research Grants Council Theme-Based Research Scheme under Grant T32-101/15-R, National Natural Science Foundation of China funded research (#51978594).

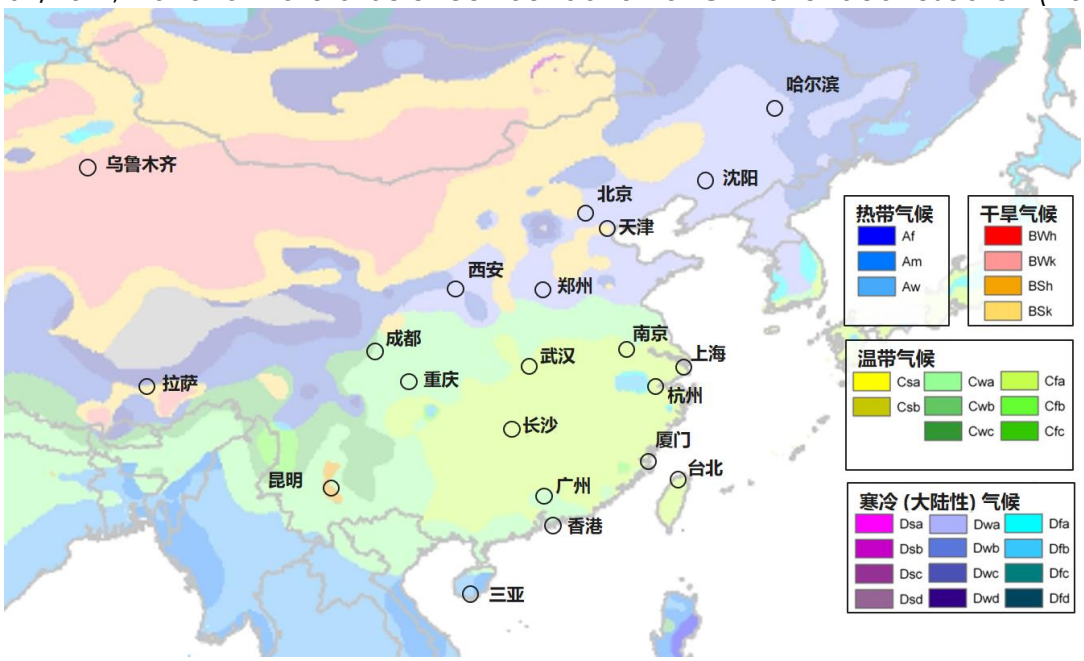


Fig. 12 Implementation of thermal adaptation studies in multiple cities across climate zones.

2.10. Climate Change and Urban Heat Stress for the City of Cambridge Master Plan 2050

Jianxiang Huang[1], Yali Wang[1], Romil Seth[2], Brie Hensold[2]
[1] Department of Urban Planning and Design, Faculty of Architecture, The University of Hong Kong
[2] Sasaki Associates, Inc. (Watertown, MA)

Abstract In collaboration with Sasaki Associate Inc., an urban planning and design firm based off Watertown, Massachusetts, USA, researchers from the Sustainable High Density Cities Lab studied climate change and its impact on outdoor activities for the master plan bidding for the City of Cambridge, Massachusetts of 2050. The aim is to assess potential disruptions to pedestrian and cycling activities from future climate and to improve urban resilience to climate change. The research team used software tool CityComfort+ to assess present and future urban microclimate, heat island effect, air ventilation, and outdoor thermal comfort. The site covers an area of 18 km^2 and its 100,000 residents. Results show that future heat stress will impose challenges for pedestrians, cyclist as well as the use of open spaces. Reducing hardscape paving, increasing urban greenery, and water features can significantly mitigate future heat stress.

Acknowledgement Sasaki Associates, Inc.

Fig. 13 Existing urban configuration of Alewife neighbourhood in the City of Cambridge, Massachusetts, USA

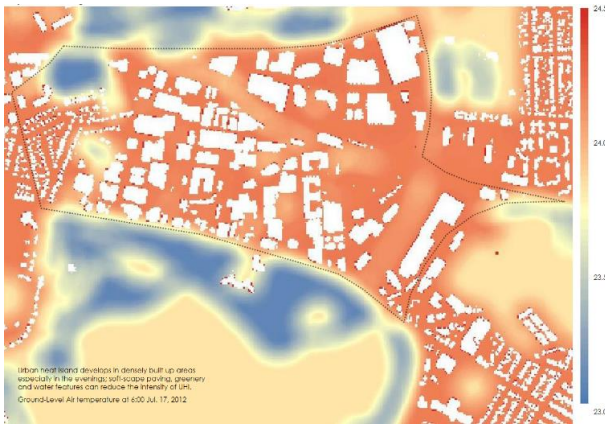


Fig. 14 Predicting urban heat island effect using CityComfort+ for the City of Cambridge, Massachusetts, USA

2.11. Urban Climate Challenge in light of Urbanization and Climate Change: A Case of Yueqing

Jianxiang Huang[1], Yali Wang[1], Rong Peng[1], Yiyang Yang[1], John D. Spengler[2], Linda P. Tomasso[2]
[1] Department of Urban Planning and Design, Faculty of Architecture, The University of Hong Kong
[2] Department of Environmental Health, Harvard T.H. Chan School of Public Health

Abstract Environmental parameters for Yueqing's urban core (8km by 8km) including heat stress, air pollution, daylighting, and air ventilation is modelled using CityComfort+. Results show that in 2080, heat stress during summer will rise significantly due to climate change and urban heat island effects, threatening the safety of residents especially the elderly and children. The concentration of air pollutants from traffic and building exhaust affect the health of those who dwells near major artery roads. Yueqing's urban growth is expected to further increase the density of built environment and alter ground thermal properties due to loss of vegetation cover and water features.

Acknowledgement Harvard University Centre for Health and the Global Environment, CP Group

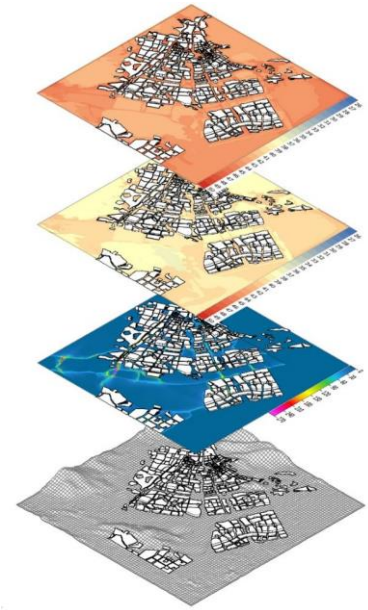


Fig. 15 Predicted urban heat island effect, air pollution and heat stress for the historical urban core of Yueqing.

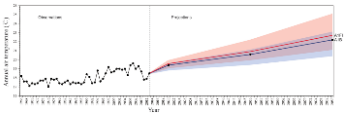


Fig. 16 Yueqing's annual average air temperature, past and future (using IPCC scenarios)

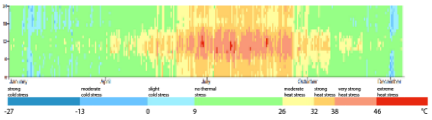


Fig. 17 Predicted outdoor thermal comfort conditions for Yueqing on annual-hourly basis.

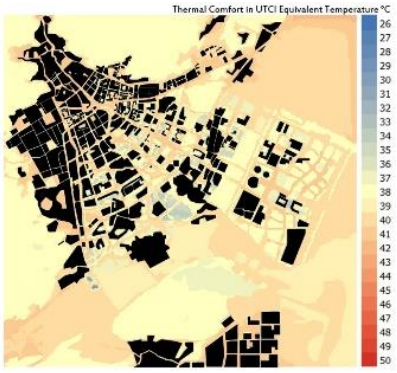


Fig. 18 Thermal comfort conditions for Yueqing at present (2005)

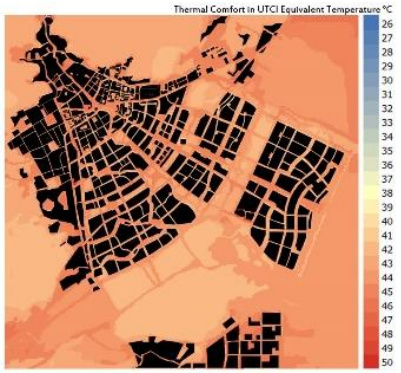


Fig. 19 Thermal comfort conditions for Yueqing in 2080 based on IPCC A2 scenario

2.12. Inform Design Schemes in Urban Commercial Complex Development

Jianxiang Huang1, Yali Wang1, Rong Peng1,
[1] Department of Urban Planning and Design, Faculty of Architecture, The University of Hong Kong

Abstract Researchers from the Sustainable High Density Cities Lab collaborate with design practitioners in real-world projects. Computer simulations were conducted to evaluate the environmental performances of building massing, landscape features, and surface materials in order to improve pedestrian comfort in open spaces. Results are used to identify design schemes with superior environmental performances and later stage design.

Acknowledgement Harvard University Centre for Health and the Global Environment, CP Group

Ground-level air temperature at 6:00 on June 1 2005 for Scheme 1 (left) and 2 (right)

Fig. 20 Simulation results were used to inform selection of design schemes for CP Modern City in Yueqing.

Fig. 21 Inform design scheme choice for implementation.

2.13. Sustainable and Resilient Urban Design for Navi-Mumbai

Kathy Ching Men Cheung[1], Farzana Saddiqua[1], Huiqiao Li[1], Quanfeng Li[1], Jianxiang Huang[1], Sylvia Nguyen[1], Guy Perry[2]

[1] Department of Urban Planning and Design, Faculty of Architecture, The University of Hong Kong

[2] McKinsey & Company

Abstract India's rapid urbanization has been confronted by resource constraints, environmental pollution and climate change. Students from the Master of Urban Design Programme at the University of Hong Kong tackle the above challenges and use advanced simulation tools to analyse and optimize urban design schemes in order to mitigate storm water risks, air pollution and improve qualities of public open spaces. The design scheme has received special recognition from the developer, The Wadhwa Group, and is put into implementation stage.

Acknowledgement The Wadhwa Group of Mumbai, India

Fig. 22 Orientation of building massing towards prevailing wind direction in order to mitigate urban heat and air pollution.

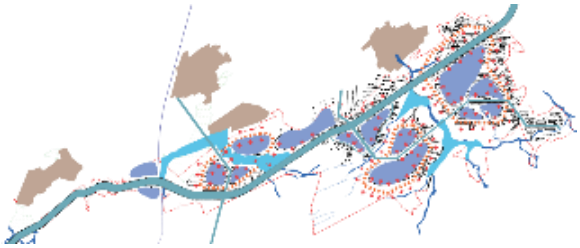


Fig. 24 Urban storm water management design scheme in response to climate change

Fig. 23 Urban design scheme for the wise city in Navi-Mumbai

2.14. Window Views & Subjective Happiness in High-Density Cities

Scott Shiguo Long [1] Jianxiang Huang[1]
[1]Sustainable high Density Cities Lab, HKUrban Lab, Faculty of Architecture, The University of Hong Kong

Abstract The loss of window view is an inevitable consequence of living in a dense city. More than 80% of Hong Kong's households do not have adequate window views of natural scenes. Researchers from SHDC using computer simulation to study wind views, daylighting and their correlations with public health records from the FAMILY Cohort. A pilot study conducted in Sai Ying Pun neighbourhood, Hong Kong, revealed that the "Green View Factor" is significantly associated with the Subjective Happiness Scale, after controlling for income, age, education, gender, and attributes of dwelling units.

Fig. 25 Phographic measurement and computer simulation of window view characteristics in Hong Kong

3. Events & Activities

As an integral part of a world-class network of building / architectural / environment / urban science, SHDC team continues to reach out to collaborating institutions, attend academic conferences, host incoming visitors. A list of SHDC events and activities are highlighted below in 2018 and 2019.

SHDC team members attend the SBE19 Conference held in Cardiff, UK, September 2019

3.1. Visit to Siemens Digital Hub in Hong Kong, April 11,2018

A delegate of SHDC visited Siemens Digital Hub Located in Hong Kong Science Park on April 11, 2018. The meeting included agendas on plans to collaborate on research and application to government-industry funding schemes.

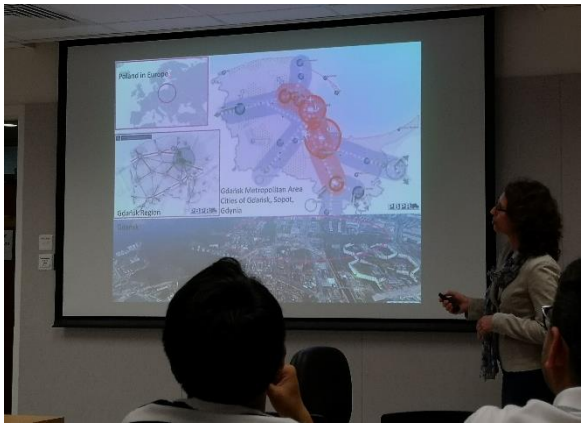
Fig. 26 SHDC visit to Siemens Smart Digital Hub in Hong Kong Science Park. From Left to right, Director Keith Cheng, Dr. Jianxiang Huang, Mr. Yiming Sun, Dr. Anqi Zhang, Ms. Gilian Li, Ms. Jimalyn Yao

3.2. Presentation to Group from the University of Minnesota, May 30, 2018

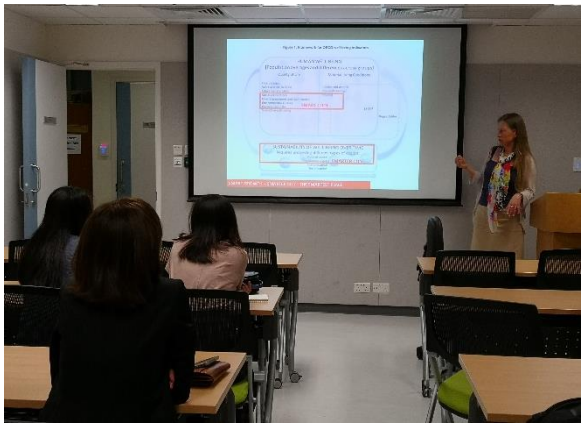
Dr. Jianxiang Huang was invited to meet and gave a presentation to a group professors and students from the Hubert H. Humphrey School of Public Affairs the University of Minnesota. The trip was part of the study abroad course entitled" Planning China's Urban Billion" and led by Prof. Yingling Fan from the University of Minnesota. Dr. Huang introduced on-going research conducted by SHDC, the presentation was also attended by Prof. Zhang Xiaoling, Department of Public Policy of the City University of Hong Kong and Dr. Xingjian Liu, Department of Urban Planning and Design at the University of Hong Kong.

3.3. Visitors from Gdansk University of Technology, May 16, 2018

Prof. Karolina Krosnicka and Prof. Joanna Glowinska of Gdansk University of Technology visited the sustainable high density cities Lab on May 16, 2018. The two presented their ongoing research on urbanism and innovative cities in European context. The purpose of the visit was to discuss collaborative research projects based on urban big data analytics (see Research Project #2)



Prof. Karolina Krosnicka gave a presentation on research



Prof. Joanna Glowinska gave a presentation on research

3.4. Dr. Mengdi Guo Thesis Defence June 4, 2018

Dr. Mengdi Guo successfully defended her thesis entitled" Assessment of Environmental Noise in High-Density Cities: Simulation, Measurement, and Data Analytics".

Fig. 27Dr. Mengdi Guo during field studies of household traffic noise exposure in Shek Kip Mei, Hong Kong

3.5. HKUrban Lab Film Production, June 13, 2018

SHDC team contributed to the filming of the HKUrban Lab movie entitled "The Future of Cities". The team used measurement equipment to feature urban noise, heat and air pollution in Hong Kong's street scenes for the Episode 5, Nerves.

Fig. 28 Mr. Tom Cozens, film director, Dr. Anqi Zhang and Dr. Guibo Sun measuring noise and heat conditions in Mongkok using sound and infrared camera.

3.6. Mr. T.W. Ng, Senior Town Planner from the Planning Department, visited SHDC July 4, 2018

Mr. TW Ng senior town planner of the Hong Kong Planning Department visited the Sustainable High Density Cities Lab on Jul.4. Dr. Jianxiang Huang and Dr. Mengdi Guo presented research projects related to Urban Noise Assessment and Big-Data Studies. The follow up discussions focus on potential research topics such as resilient planning, pollution mitigation, electric vehicles, as well as diesel powered buses in Hong Kong.

Fig. 29 Research presentation by SHDC team. From left to right, Dr. Mengdi Guo, Dr. Jianxiang Huang, Mr. T.W. Ng

3.7. Presentation to a group from Beijing University of Civil Engineering and Architecture, July 17, 2018

Dr. Jianxiang Huang presented ongoing research projects at the SHDC to a delegate of students and faculty members from the School of Architecture and Urban Planning at the Beijing University of Civil Engineering and Architecture (BUCEA). The delegate was led by Prof. Katherine Chen.

Fig. 30 Dr. Jianxiang Huang delivered a presentation to visitors from BUCEA

3.8. Prof. Rong-Juin Shyu visit SHDC Lab, July 30, 2018

Prof. Rong-Juin Shyu of National Taiwan Ocean University has visited the Sustainable High Density Cities Lab. The purpose of the visit is to facilitate research collaboration on urban noise monitoring using urban data analytics (see Research Project #3)

3.9. China-UK Workshop on Renewal Energy Systems, Aug.6-9, 2018

Prof. Phil Jones, Dr. Hu Du and Dr. Jianxiang Huang participated in the 2018 China-UK workshop on Renewal Energy Systems in Zero Carbon Villages held in Lhasa, Tibet. Prof. Phil Jones gave a keynote speech entitled "Low Carbon Buildings", Dr. Hu Du gave a keynote speed entitled "Plug-n-Harvest Façade and Energy Retrofit in Lhasa". Dr. Jianxiang Huang gave a research presentation entitled: "Urban Microclimate and Building Energy in High-Density Cities".

Fig. 31 Workshop delegates posing in front of the main venue in Lhasa, Tibet

Fig. 32 A zero carbon public amenities building in Lhasa by Dr. Hu Du, Prof. Phil Jones and collaborators

3.10. Visitors from the Solar and Building Environment Research Group from Xi'an Architecture University visit SHDC Lab, Aug. 23 2018

Prof. Dengjia Wang and the solar building and environment research group from Xi'an Architecture University has visited the Sustainable High Density Cities Lab. Prof. Wang and his group presented the latest researches on building energy, solar building, and thermal comfort in Western China. SHDC team presented energy and urban climate modelling research work in high-density urban context.

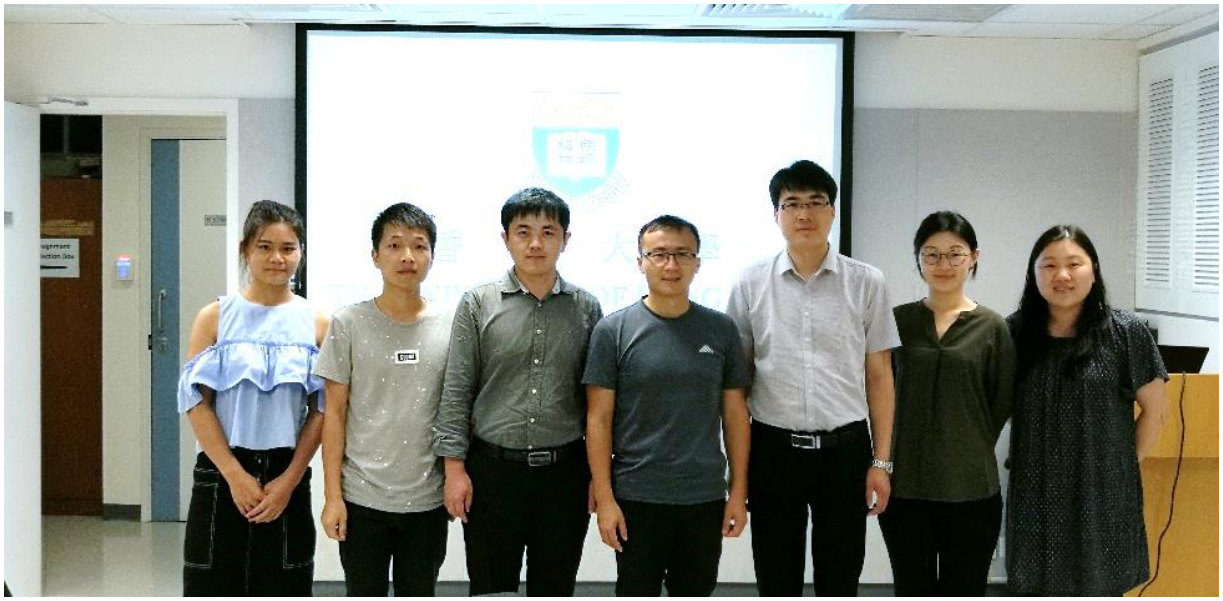


Fig. 33 SHDC team meeting with visitors from the Xi'an University of Architecture and Technology. From left to right: Ms. Liu Hui, Dr. Yong Li, Dr. Jianxiang Huang, Prof. Dengjia Wang, Dr. Mengdi Guo, Dr. Anqi Zhang

3.11. Visit to Beijing University of Civil Engineering and Architecture, Nov. 16 2018

Dr. Jianxiang Huang delivered a research presentation at the Beijing University of Civil Engineering and Architecture. He visited the Beijing Advanced Innovation Centre for Future Urban Design established at BUCEA, a key research laboratory funded by the Beijing municipal government.

Fig. 34 Visit to the Beijing Advanced Innovation Centre for Future Urban Design. From left to right: Dr. Mengdi Guo, Prof. Katherine Chen, Dr. Jianxiang Huang

3.12. Research Presentation at Buro Happold Engineering, Dec. 13 2018

A SHDC team consisted of Dr. Jianxiang Huang, Dr. Mengdi Guo, Ms. Tongping Hao and Mr. Yimin Sun visited the Hong Kong office of Buro Happold Engineering, a global technology consulting firm specialized in sustainability and green buildings. The SHDC team delivered a presentation to engineers from Buro Happold and Prof. Tarek Rakha of Georgia Institute of Technology.

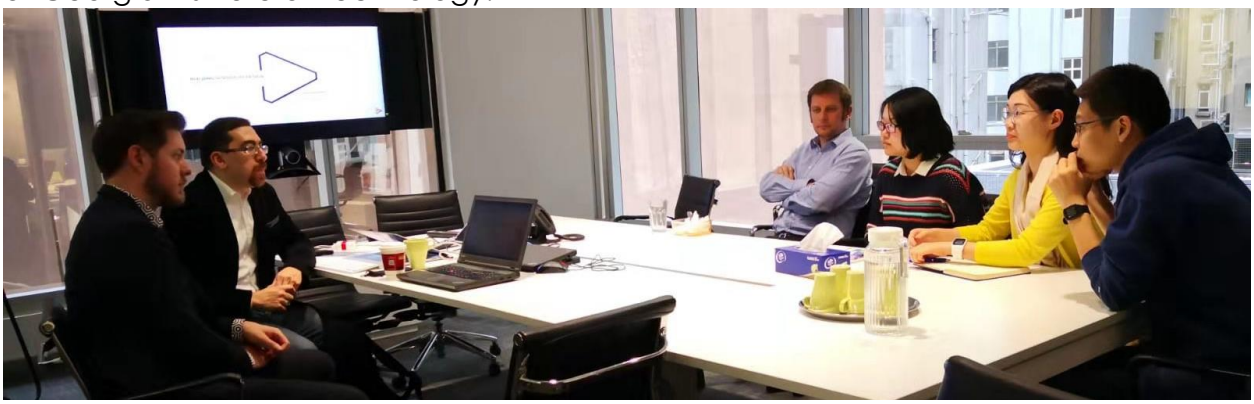


Fig. 35SHDC discuss research at Buro Happold Engineering. From left to right: John Sullivan (Buro Happold), Dr. Tarek Rakha (Georgia Tech), Tongping Hao (SHDC), Dr. Mengdi Guo (SHDC), Mr. Yimin Sun (SHDC)

3.13. Dr. Anqi Zhang PhD Examination, Dec.14, 2018

Dr. Anqi Zhang successfully defended her thesis entitled "A Simulation Model for Assessing Traffic Related Air Pollution in Street Canyons of High-density Cities". Dr. Anqi Zhang was under the supervision of Dr. Jianxiang Huang and Prof. Anthony Yeh.

3.14. GHHIN Global Forum on Heat and Health, Dec.17-20, 2018

The SHDC team contributed to the organization of the first GHINN Forum on heat health held in Hong Kong on Dec.17-20, 2018. The forum focuses on impact of heatwaves on temperature-related illnesses as well as mitigation measures by governments, NGOs and communities. The event was spearheaded by the joint office of the WHO and WMO and invited approximately 200 participants from 30+ countries/region. Dr. Ren Chao served as the chair of the local preparation committee. The SHDC team provided the conference venue on the university campus as well as logistic support such as registration, catering and food services. Dr. Jianxiang Huang, Dr. Mengdi Guo, Mr. Yimin Sun, Ms. Tongping Hao participated in the conference.

Fig. 36Delegates of the first GHINN global forum pose at HKU Graduate Housing, the main conference venue on Dec.17, 2018

3.15. Visit to Tianjin University Feb.26, 2019

Dr. Jianxiang Huang, Prof. Phil Jones visited Tianjin University. The SHDC team met with Prof. Conghong Liu, Prof. Wei Yang, and Prof. Gang Liu from Tianjin University School of Architecture and discussed collaboration opportunities. The SHDC team was given a tour of the Tianjin Building Physical Environment and Ecological Technologies Key Lab (天津市建筑物理环境与生态技术重点实验室)

Fig. 37 Prof. Phil Jones at Tianjin Building Physical Environment and Ecological Technologies Key Lab with Prof. Yang Wei, Prof. Zhang Anxiao and Prof. Liu Gang of Tianjin University

3.16. Visit to CCCC Shanghai, Feb.28, 2019

Prof. Phil Jones and Dr. Jianxiang Huang were invited to visit Eco-Friendly Building Technology Company Ltd., a subsidiary company of the China Communications Construction Company, Ltd. in Shanghai, China. The SHDC team discussed research collaboration with the host in development of zero-carbon residential buildings using renewal energy and modular construction techniques.

Fig. 38 Prof. Phil Jones met with Mr. Jason Zhang of CCCC in Shanghai

3.17. Professor Matthew S. Kressy visit SHDC, March 30, 2019

Professor Matthew S. Kressy of MIT, School of Engineering & Sloan School of Business visited the Sustainable High Density Cities Lab. Prof. Kressy shared experiences as the founder and director of the MIT Integrated Design & Management (IDM), a two-year interdisciplinary master's programme.

Fig. 39 Professor Matthew S. Kressy of MIT, Dr. Jianxiang Huang during the visit to SHDC

3.18. Presentation at City University of Hong Kong, March 31, 2019

Dr. Jianxiang Huang was invited to give a lecture on urban big data and smart city at the City University of Hong Kong. The audience consists of students and faculty members from the newly founded School of Data Science.

Fig. 40 Dr. Jianxiang Huang deliver a presentation at the School of Data Science at City University of Hong Kong.

3.19. 15th International Conference on Green and Energy-Efficient Building and New Technologies, April 3, 2019

Dr. Jianxiang was invited to present SHDC research projects at the 15th International Conference on Green and Energy-Efficient Building and New Technologies and Products Expo in Shenzhen April 3-4, 2019. The conference is organized by the China Society of Urban Studies, the Shenzhen government, US China Green Fund, and China Green Building Council and attended by 3500 delegates from the disciplines of green building, urban planning, architecture, engineering and construction. Dr. Huang gave a presentation: "Sustainable High-Density Cities Lab: Linking Research with Design".

Fig. 41 Dr. Jianxiang Huang delivering a presentation at the 15th International Conference on Green and Energy-Efficient Building and New Technologies

3.20. 3rd University – Government – Industry Forum, May 3, 2019

Dr. Jianxiang Huang attended the 3rd University – Government – Industry Forum held at the Hong Kong Polytechnique University. He is also a member of the UGI organizing committee and co-chair the parallel session entitled: "Stream E: Green Innovation and Technology" together with Mr. Ir. Harry Hon-Chung Lai, Deputy Director of the EMSD. The session features presenters including Prof. Shengwei Wang (PolyU), Ir. Tommy Lam (EMSD), Ir. Dr. Kevin Wan (EMSD), Prof. Hongxing Yang (PolyU), Ir. Sam Choi (EMSD) and Ir. Dr. Vincent Cheng (Arup)

3.21. Field measurement of built environment attributes in Xichang Street Neighbourhood, Changsha, May 7-10, 2019

Dr. Mengdi Guo and Mr. Yiqi Liu conducted measurement in Xichang Street Neighborhood in Changsha, Hunan Province. Teaming up with research students from Hunan University, The SHDC team measured noise, thermal, odor environment, as well as the air and view quality of densely populated neighbourhoods.

Fig. 42 Field measurement in the Xichang Street Neighbourhood

3.22. Visit to Hunan University, May 24, 2019

Dr. Mengdi Guo, Dr. Jianxiang Huang, Prof. Phil Jones, and Mr. Yiqi Liu visited School of Architecture of Hunan University in Changsha, Hunan Province May 23-24, 2019.
The SHDC team participated in the Six-University Joint Urban Design Studio Final Review held in Hunan University, Changsha. Prof. Phil Jones is invited to give a presentation at the School of Architecture in Hunan University entitled: "Zero Carbon Energy Positive Buildings"

Fig. 43 Dr. Mengdi Guo and Dr. Jianxiang Huang participate in the Six-University Joint Urban Design Studio Final Review held in Hunan University, Changsha

Fig. 44 Prof. Phil Jones delivers a presentation in Hunan University. From left to right: Dr. Jing Ran, Prof. Phil Jones, Dean Prof. Chunyu Wei, Prof. Feng Xu, Dr. Jianxiang Huang

3.23. Visit to Tsinghua University, May 26, 2019

Dr. Jianxiang Huang, Prof. Phil Jones, and Dr. Mengdi Guo visited collaborators at Tsinghua University in Beijing. The purpose is to conduct joint research within the scope of the HKU-Tsinghua strategic partnership fund. The SHDC team brought measurement instruments to collect indoor and outdoor environmental attributes. The team also brought WIFI-scanners to connect occupant behavioural metrics.

Fig. 45 SHDC team during research meeting with Tsinghua peers. From left to right: Dean Prof. Weimin Zhuang, Dr. Weixin Huang, Dr. Sisi Liang, Prof. Phil Jones, and Dr. Jianxiang Huang

Fig. 46 SHDC team meeting Tsinghua University collaborators. From left to right: Dr. Jianxiang Huang, Prof. Phil Jones, Prof. Xudong Yang, and Dr. Sisi Liang

3.24. Presentation at the Hong Kong Institute of Planners, June 6, 2019

Dr. Jianxiang Huang was invited to give a presentation at the Hong Kong Institute of Planners. The presentation, entitled "Empowering Planners: Measurement, Simulation and Machine Learning", is part of the lecture series focusing on smart city, technology and town planning.

3.25. Presentation at International Association for China Planning (IACP), June 15, 2019.

Ms. Tongping Hao has presented a research paper at the IACP annual conference held in Chengdu, China. The paper is entitled "A Simulation-Design Workflow to Improve Urban Environmental Performance in Dense Cities", by Dr. Jianxiang Huang, Ms. Tongping Hao, and Prof. Phil Jones.

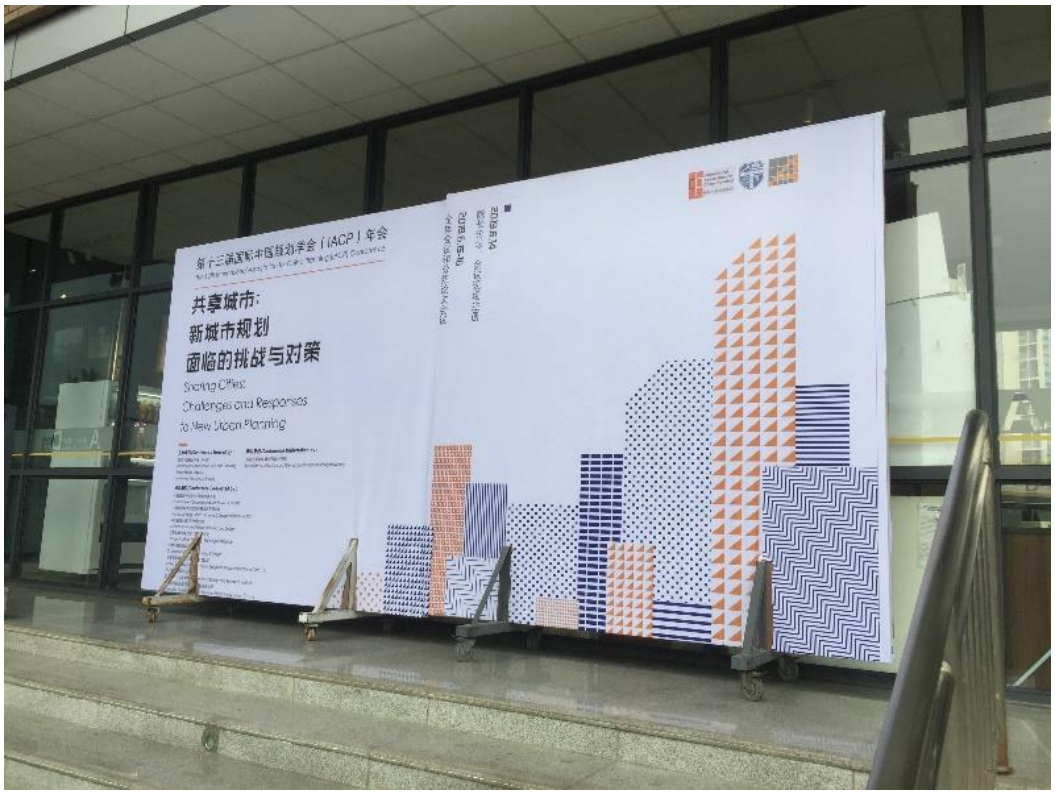


Fig. 47 IACP 2019 Conference featuring the theme of "sharing cities: challenges and responses to new urban planning" held in Chengdu

3.26. Presentations to University of Minnesota Group, June 30, 2019

Dr. Jianxiang Huang, Dr. Weifeng Li, and Dr. Xingjian Liu hosted a group of visitors from the University of Minnesota. They delivered presentation on research work followed by discussions and exchanges.

Fig. 48 Dr. Jianxiang Huang, Dr. Weifeng Li, and Dr. Xingjian Liu meeting with students and faculty members from the University of Minnesota

3.27. Field measurement of built environment attributes and health in Bangkok, Thailand, July 3-10, 2019

Dr. Mengdi Guo travelled to MQDC headquarter in Thailand and presented research on urban environment and human health at the MQDC annual corporate meeting held in Bangkok, Thailand. The purpose of the trip is to collected environmental and health data for office workers in collaboration with Harvard University Centre for Health and the Global Environment.

Fig. 49 Field measure of office environment attributes in Bangkok, Thailand

Fig. 50 Dr. Mengdi Guo present at the MQDC annual corporate meeting on behalf of SHDC

3.28. Field measurement of Yuan Bai Building in Beijing Normal University Zhuhai Campus, Zhuhai

Dr. Mengdi Guo and Mr. Zurun Yu travelled to Zhuhai to measure the thermal environment and air ventilation of Yuan Bai Building in Beijing Normal University Zhuhai Campus. The purpose was to conduct evaluate the thermal environment and air ventilation condition before the renovation of Yuan Bai Building.

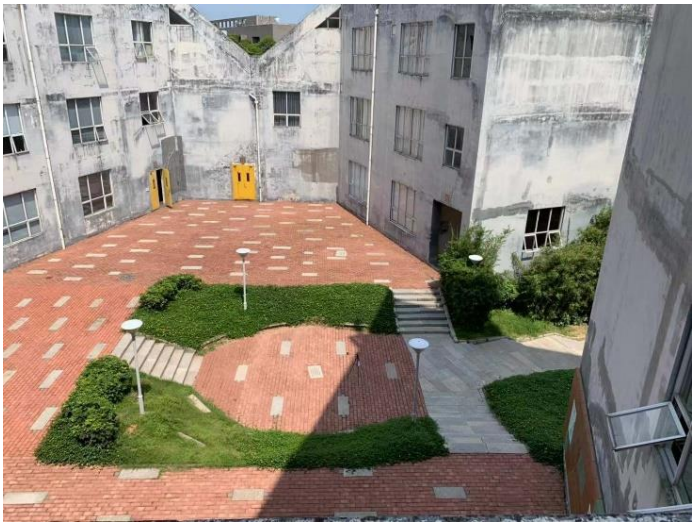


Fig. 51 Field measurement of Yuan Bai Building in Beijing Normal University Zhuhai Campus

3.29. Sept. 12, 2019 Siemens Greater Bay Area Forum

Dean Prof. Chris Webster and Dr. Jianxiang Huang travelled to Guangzhou, China to attend the Siemens Greater Bay Area Forum on Sept. 12. They met with Dr. Zhu, CEO of Siemens China and John Zhou, Director of Siemens External Collaboration and discussed plans to collaborate with Siemens in joint ventures of research infrastructure in the Greater Bay Area and to apply for government and industrial sponsored funding schemes.

Fig. 52 Dean Professor Chris Webster attended the Siemens Greater Bay Forum in Guangzhou

3.30. Visit to Shandong Jianzhu (Architectural) University, Jinan, Sept.13

Prof. Phil Jones and Dr. Jianxiang Huang visited Shandong Jianzhu University. The purpose of the visit is to conduct collaborative research focusing on low-carbon city and villages in Shandong province.

Fig. 53 Prof. Phil Jones and Dr. Jianxiang Huang with local government officials and researchers in Shizilin Village, Yinan County, Shandong Province

3.31. Hangzhou Future Community Research, Sept.15, 2019 Hangzhou

Dr. Jianxiang Huang and Prof. Phil Jones visited Hangzhou, China in Sept.15, 2019. The purpose is to advance collaboration and establish a knowledge exchange project between SHDC and Southeast Architectural Design Co. Ltd in Hangzhou. SHDC team visited urban sites in which sustainable retrofitting and redevelopment projects are being conceived.

Fig. 54 Dr. Jianxiang Huang and Prof. Phil Jones conduct fieldtrip to urban redevelopment project site in Hangzhou

Fig. 55 SHDC team discuss with industrial partners in order to promote sustainable planning and design practice

Fig. 56 SHDC visit Southeast Architecture Design Co. Ltd in Hangzhou. From left to right, Director Tianfen Hong, Dr. Jianxiang Huang, Chairman Jianjun Qiu, Prof. Phil Jones

3.32. International Forum on Innovation and Emerging Industries Development 2019, Shanghai, China, Sept.16-18, 2019 Shanghai

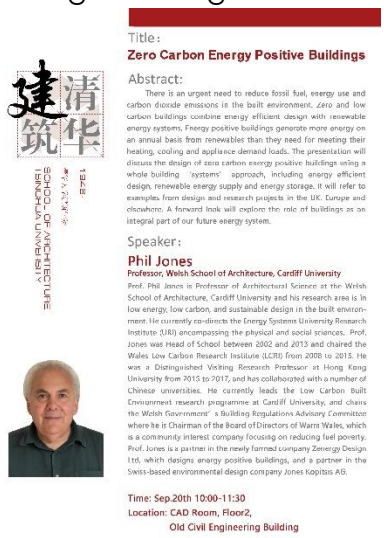
Prof. Phil Jones and Dr. Jianxiang Huang attended the 2019 International Forum on Innovation and Emerging Industries Development (IEID 2019) held in Shanghai on Sept.16-18. Prof. Jones gave a keynote speech entitled "Zero Carbon Energy Positive Buildings" and joined the roundtable discussion. Prof. Phil Jones was invited to give a lecture at Tongji University School of Architecture and Urban Planning.

Fig. 57 Prof. Phil Jones gave a keynote speech at the IEID conference and joined the round table discussion

Fig. 58 Prof. Phil Jones giving a lecture at Tongji University. Left: Prof. Philip F. Yuan (Tongji). Right, Prof. Phil Jones.

3.33. Visit to Tsinghua University and Sept.20 Beijing

Prof. Phil Jones was invited to give a lecture entitled: "Zero Carbon Energy Positive Buildings" at Tsinghua University. He was also invited to visit


Title:
Zero Carbon Energy Positive Buildings

Abstract:

There is an urgent need to reduce fossil fuel, energy use and carbon dioxide emissions in the built environment. Zero and low carbon buildings combine energy efficient design with renewable energy systems. Energy positive buildings generate more energy on an annual basis from renewables than they need for meeting their heating, cooling and appliance demand loads. The presentation will discuss the design of zero carbon energy positive buildings using a whole building 'systems' approach, including energy efficient design, renewable energy supply and energy storage. It will refer to examples from design and research projects in the UK, Europe and elsewhere. A forward look will explore the role of buildings as an integral part of our future energy system.

Speaker:

Phil Jones

Professor, Welsh School of Architecture, Cardiff University

Prof. Phil Jones is Professor of Architectural Science at the Welsh School of Architecture, Cardiff University and his research area is in low energy, low carbon, and sustainable design in the built environment. He currently co-directs the Energy Systems University Research Institute (URI) encompassing the physical and social sciences. Prof. Jones was Head of School between 2002 and 2013 and chaired the Wales Low Carbon Research Institute (LCRI) from 2008 to 2015. He was a Distinguished Visiting Research Professor at Hong Kong University from 2015 to 2017, and has collaborated with a number of Chinese universities. He currently leads the Low Carbon Built Environment research programme at Cardiff University, and chairs the Welsh Government's Building Regulations Advisory Committee where he is Chairman of the Board of Directors of Warm Wales, which is a community interest company focusing on reducing fuel poverty. Prof. Jones is a partner in the newly formed company Zerergy Design Ltd, which designs energy positive buildings, and a partner in the Swiss-based environmental design company Jones Kopitsis AG.

Time: Sep.20th 10:00-11:30
Location: CAD Room, Floor2,
Old Civil Engineering Building

Fig. 59 Poster of Prof. Phil Jones's lecture at Tsinghua University.

Fig. 60 Prof. Phil Jones visit China Architecture Design & Research Group and presented research works to the audience of architects and design practitioners.

3.34. September 24-25, 2019 Sustainable Built Environment Conference Cardiff, Wales

Prof. Phil Jones served as the Chair for the Sustainable Built Environment Conference 2019 held from Sept.24 to 25, 2019 in Cardiff, Wales, UK. Dr. Jianxiang Huang, Dr. Mengdi Guo attended the SBE19 Conference and delivered two papers / presentations in the conference entitled: "Simulation-Informed Urban Design: Improving Urban Microclimate in Real-World Practice in a High Density City" by Jianxiang Huang, Tongping Hao, Shan Shan Hou, and Phil Jones as well as "3D built-environment attributes and household road traffic noise exposure in Hong Kong" by Mengdi Guo, Jianxiang Huang, Michael Yuxuan Ni. Dr. Huang served as the Session Chair for Parallel Session "Urban Space" in the afternoon of Day 1.

Fig. 61 Prof. Phil Jones chair the discussions during the roundtable session

Fig. 62 Dr. Jianxiang Huang deliver a research presentation at the SBE19 conference in Cardiff Wales

Fig. 63 Dr. Mengdi Guo deliver presentation at SBE19 conference

3.35. Presentation at Tai Mountain Academic forum: Key elements and core driving forces of smart city

Dr. Jianxiang Huang has been invited to give a presentation at the Tai Mountain Academic forum: Key elements and core driving forces of smart city held on Dec.7, 2019 in Jinan, Shandong province, China. The event is hosted by Shandong Jianzhu University. Dr. Huang's presentation title was Smart Urban Design: Theories, Practice and Reflection (智慧城市设计: 理论、实践和反思)

Fig. 64 Dr. Jianxiang Huang deliver a presentation on SHDC research projects

3.36. Shenzhen-Hong Kong 2019 Biennale (Guangming)

The SHDC lab is invited to exhibit research projects at the Shenzhen-Hong Kong 2019 Biennale (Guangming). SHDC is among other research labs to be invited at the same venue such as the Future Cities Laboratory (FCL) of Singapore-ETH, The City Form Laboratory of Harvard GSD, and Singapore Urban Renewal Authority, etc. The theme of the SHDC exhibition is "Sustainable High Density Cities: Linking Research with Practice".

Fig. 65 Dr. Jianxiang Huang during the round table discussion at the Shenzhen Hong Kong 2019 Biennale (Guangming) opening ceremony.

Fig. 66 SHDC research exhibited in the Biennale. The team used an interactive installation of urban environmental and energy use information projected on a 3D printed model of Sai Ying Pun.

4. Publications

The following academic publications are highlighted from SHDC between 2018-19

- Huang, J. *; Jones, P.; Zhang, A.; Peng, R.; Li, X.; Chan, PW. "Urban Building Energy and Climate (UrBEC) Simulation: Example Application and Field Evaluation in Sai Ying Pun, Hong Kong" Energy and Buildings [IF=4.46] (In Press)
- Huang, J.; Hao, T.; Hou, S.; Jones, P.* (2019) "A Simulation-Design Workflow to Improve Urban Environmental Performance in Dense Cities", Proceedings of the 2019 Sustainable Built Environment Conference, Cardiff, UK [Sept.24-25] Available at https://iopscience.iop.org/article/10.1088/1755-1315/329/1/012047/meta
- Guo, M.; Huang, J.*; Ni, Y. (2019) "3D Built-Environment Attributes and Household Road Traffic Noise Exposure in Hong Kong", Proceedings of the 2019 Sustainable Built Environment Conference, Cardiff, UK [Sept.24-25] Available at https://iopscience.iop.org/article/10.1088/17551315/329/1/012012
- Liang, W.; Huang, J.*; Jones, P.; Hang, J.; Wang, Q. (2018) "A Zonal Model for Assessing Street Canyon Air Temperature of High-Dense Cities", Building and Environment, vol.132, pp. 160-169 [IF=4.54]
- Du, H., Huang, P. and Jones, P. 2019. Modular facade retrofit with renewable energy technologies: The definition and current status in Europe. Energy and Buildings 205, article number: 109543. (https://doi.org/10.1016/j.enbuild.2019.109543)
- Xing, Y. and Jones, P. 2019. In-situ monitoring of energetic and hydrological performance of a semi-intensive green roof and a white roof during a heatwave event in the UK. Indoor and Built Environment (10.1177/1420326X19887218)
- Alnusairat, S. and Jones, P. 2019. Ventilated skycourts to enhance energy savings in high-rise office buildings. Architectural Science Review (10.1080/00038628.2019.1685453)
- Perisoglou, E.et al. 2019. Building monitoring protocol development for deep energy retrofit. IOP Conference Series: Earth and Environmental Science 329, article number: 12038. (10.1088/1755-1315/329/1/012038)
- Li, X.et al. 2019. A feasibility study to evaluate the potential replication of an energy positive house in the UK. Presented at: Sustainable Built Environment Conference, Cardiff, 24-25 Sept 2019IOP Conference Series: Earth and Environmental Science, Vol. 329. Vol. C1. IOP Publishing, (10.1088/1755-1315/329/1/012049)
- Jones, P. and Tse, M. Y. 2019. Evaluation of thermal comfort in building transitional spaces - Field studies in Cardiff, UK. Building and Environment 156, pp. 191-202.
- Jones, P. 2019. An appetite to lead. Touchstone, pp. 4-5.
- Perisoglou, E.et al. 2019. Evaluation of building and systems performance for a deep domestic retrofit. Presented at: Climate Resilient Cities - Energy Efficiency & Renewables in the Digital Era (CISBAT 2019), Lausanne, Switzerland, 4-6 September 2019, Vol. 1343. IOP Publishing pp. 12176.
- Prabhakaran, R.et al. 2019. Plants and architecture: the role of biology and biomimetics in materials development for buildings. Intelligent Buildings International 11(3-4), pp. 178-211. (10.1080/17508975.2019.1669134)

- Hou, S.et al. 2019. Investigating the energy and thermal implications of installation of an air curtain and an automatic door in convenience stores in Wales. Presented at: 16th IBPSA International Conference, Rome, 2-4 September 2019. pp. -.
- Li, X.et al. 2019. Modelling and developing a neighbourhood low carbon system for five dwellings in the U.K.. Presented at: The 16th IBPSA International Conference, Rome, 2-4 September 2019. pp. -.
- Li, X., Jones, P. and Patterson, J. 2019. Modelling and developing a renewable energy system for the cold stores of a food park in the UK. Presented at: CISBAT 2019 - Climate Resilient Cities - Energy Efficiency & Renewables in the Digital Era, Lausanne, Switzerland, 4-6 September 2019.
- Hao, T.; Huang, J.*; Jones, P. (2019), "A Simulation-Design Workflow to Improve Urban Environmental Performance in Dense Cities" Proceedings of the International Association for China Planning, Chengdu, China [Jun.15-16]
- Zhang, K., Jones, P. and Stevenson, V. 2018. An optimisation design framework for residential buildings integrating air-source heat pump multi-supply system, active thermal storage, and onsite renewable energy. Presented at: Second International Conference for Sustainable Design of the Built Environment: Research in Practice, The Crystal, London, 12-13 September 2018 Presented at Elsharkawy, H., Zahiri, S. and Clough, J. eds.International Conference for Sustainable Design of the Built Environment SDBE 2018: Proceedings. pp. 729-740.
- Du, H.et al. 2018. Development of a REST API for obtaining site-specific historical and near-future weather data in EPW format. Presented at: Building Simulation and Optimization 2018, Emmanuel College, University of Cambridge, 11-12 September 2018.
- Perisoglou, E.et al. 2018. Steady state and dynamic modelling of residential transpired solar collectors performance. Presented at: 4th Building Simulation and Optimization Conference, Cambridge, UK, 11-12 September 2018. pp. -.
- Jones, P., Chun-Kuen Tonga, J. and Ming-Yeung Tse, J. 2018. Development of thermal evaluation tool for detached houses in Mongolia. Energy and Buildings 173, pp. 81-90. (10.1016/j.enbuild.2018.05.026)
- Xing, Y.et al. 2018. Growing and testing mycelium bricks as building insulation materials. IOP Conference Series: Earth and Environmental Science 121, pp. 22032. (10.1088/1755-1315/121/2/022032)
- Liang, W.et al. 2018. A zonal model for assessing street canyon air temperature of high-density cities. Building and Environment 132, pp. 160-169.

5. Research Funding & Knowledge Exchange

SHDC have received external research grant and industrial support in the form of knowledge exchange projects.

5.1. National Natural Science Foundation of China

The SHDC team has been awarded a research grant from the National Natural Science Foundation of China (国家自然科学基金面上项目 Award # 51978594). The winning proposal is entitled "A Multi-City Study of Thermal Adaptation in Urban Outdoor Spaces Using Social Media Data Analytics". The research team consists of Dr. Jianxiang Huang (PI), Prof. Phil Jones (Co-I), Dr. Lishuai Li (Co-I), Dr. Mengdi Guo (Co-I). The funding amount is RMB 550,000 and the project duration is Jan.1 2020 – Dec. 31, 2023 (4 years)

5.2. HKU Strategic Partnership Fund with Tsinghua University

SHDC team has been awarded the HKU Strategic Partnership Fund with Tsinghua University. The joint team consist of SHDC members as well as collaborators from Tsinghua University and Siemens China Research Corporation (Siemens). The winning proposal is entitled: "Smart Urban Data Platform and Sustainable Design Software for Built Environment Quality Assessment and Enhancement" (基於城市智慧平臺和數據模擬軟件的建成環境空間性能評價和優化研究). The joint team received a total of HK$ 370,000. The project duration is Jan.2019-May 2020. The HKU team is led by PI Dr. Jianxiang Huang, Co-I. Dr. Mengdi Guo, and Co-I. Prof. Phil Jones. The Tsinghua team is led by Dr. Sisi Liang, Dr. Weixin Huang, and Dr. Yan Tang from the School of Architecture. The project is supported by Dean Chris Webster of HKU Faculty of Architecture, Prof. Yuguo Li of Faculty of Engineering, and Dr. Wei Pan of Department Civil Engineering. From the Tsinghua side, the project is supported by Dean Prof. Weimin Zhuang of Tsinghua School of Architecture, Prof. Borong Lin, and Dr. Wei Zhang of Tsinghua University Architectural Design and Research Institute.

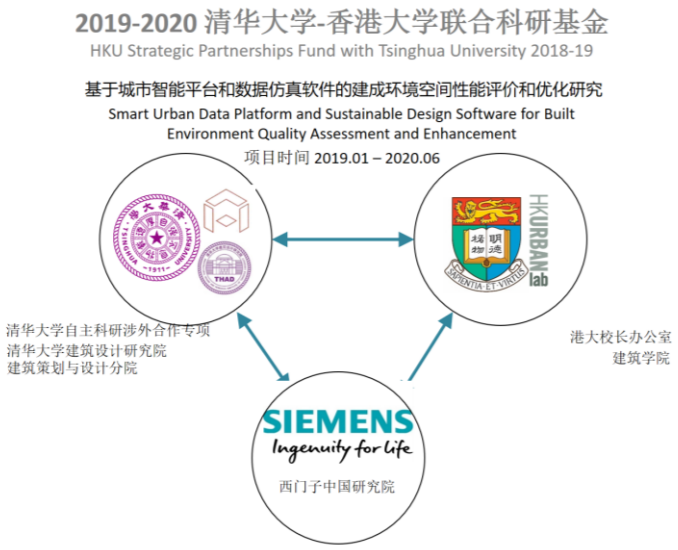


Fig. 67 The academic and industrial partners of the HKU Strategic Partnership Fund with Tsinghua University

5.3. Sino-British Fellowship Trust Visitorships 2018-19

Prof. Phil Jones has been awarded the Sino-British Fellowship Trust Visitorships 2018-19. He has made visits to the University of Hong Kong supported by the grant. The first visit took place Oct 26 – Nov 6, 2018, the second one Feb.22 – Mar.3, 2019. The visits achieved the original goals mentioned in the original proposal in terms of 1) collaborative research grant application and 2) collaborative research papers. During the visit, Prof. Phil Jones worked with Dr. Jianxiang Huang on two successful grant proposals (see above); 3 research papers, and one knowledge exchange project. He has also made two academic visits to research collaborators in mainland China together with Dr. Jianxiang Huang.

5.4. Urban Renewal Authority Stage I Project

SHDC team has successfully completed the stage 1 research project with the Hong Kong Urban Renewal Authority. The project is entitled: "A Self Developed Planning-Related Software and Computer Simulation for Urban Renewal Authority's Project / Studies". The study was conducted between 2018/3-2019/2, PI: Jianxiang Huang, Co-I: Phil Jones, Co-I: Ms. Tongping Hao. The final report of the Knowledge Exchange project was completed in March 2019: "Computer Simulation Studies for URA's development in KC-AA1, To Kwa Wan, Kowloon 土瓜灣地塊初步設計方案軟件模擬研究報告".

Fig. 68 SHDC conduct computer simulation studies in real-world projects in partnership with the industry

5.5. Urban Renewal Authority Stage II

SHDC team has started the stage II of research project with the Hong Kong Urban Renewal Authority. The second stage project is entitled "Assessment of the Active Strategies in Mitigating Heat Stress in Outdoor Open Spaces for Urban Renewal Authority's Project / Studies". SHDC provided additional software training session and conduct a preliminary study on the feasibility and cost-effectiveness of active strategies relevant to Hong Kong's climate and urban context. This includes a preliminary estimates of the cost-effectiveness for selected active devices measured in UTCI reduction, projected energy use, or water consumption, etc. The study will also conclude on strategic priorities of active devices.

5.6. Hangzhou Future Community

SHDC team embarked on a knowledge exchange project with Zhejiang Southeast Architectural Design Co., Ltd (SEA), an architectural design firm based off Hangzhou, China. The project is entitled "China Future Community, Urban Environment and Smart Planning Research". The scope of the project features application of environmental simulation software tools developed by SHDC in the Caihe urban renewal project in Hangzhou, which is among 7 selected demonstration projects conceived by the provincial government to spearhead the next phase of Chinese urban development in the backdrop of the 2022 Asia Sports Game to be hosted in Hangzhou. The project will be led by Dr. Jianxiang Huang of HKU and Prof. Phil Jones of Cardiff University, Dr. Anqi Zhang, and Dr. Mengdi Guo, etc.

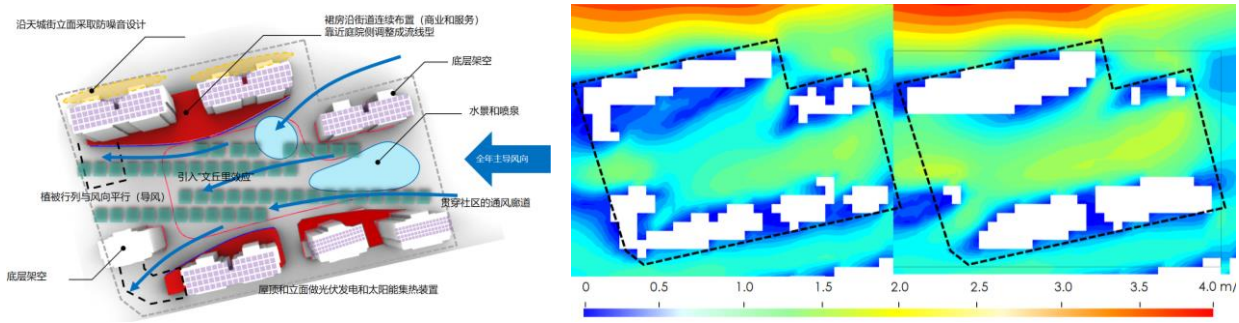


Fig. 69 SHDC team used simulation tools to enhance sustainability in urban planning and design projects in Hangzhou

5.7. Weizhou Island Masterplan

Dr. Jianxiang Huang served as the chief design advisor in collaboration with XWHO Design group in a design competition for the master plan of Weizhou Island, a 22 km^2 volcanic island in Guangxi Province located in the Bay of Tokins. The aim for the collaboration is to promote SHDC research and advance sustainable and zero carbon visions in the master plan development in a real-world project. The competition entry was shortlisted.

Fig. 70 SHDC's zero-carbon island vision for the Weizhou Island master plan, featuring compact development clusters connected by transit, preservation of ecologically sensitive land, storm water management, and energy positive buildings

6. Awards & Media Coverage

SHDC has been received the following awards and media coverage in relation to its research activities

6.1. Prof. Phil Jones Receives OBE in Queen's New Year Honours List 2020

Professor Phillip John Jones received an OBE for services to Architecture and Decarbonisation in the Queen's New Year Honours list 2020.
Read More at: https://www.gov.uk/government/publications/new-year-honours-list-2020

6.2. SHDC Research Receive SSPCR 2019 Best Presentation Award

SHDC research paper in collaboration with Gdansk University of Technology has received SSPCR 2019 Best Presentation Award. The paper, entitled "The Image of the City on Social Media: A Comparative Study on the "Big Data" and "Small Data" in the Try-City Region, Poland", by Jianxiang Huang, Hanna Prondzynaska, Dorota Kamrowska-Zaluska, Yiming Sun, and Lishuai Li, received the Best Presentation Award from 3rd International Conference on Smart and Sustainable Planning for Cities and Regions -SSPCR 2019, held in Bolzano, Italy on Dec.9-13, 2019. The presentation was delivered by Dr. Dorota Kamrowska-Zaluska and Dr. Hanna Prondzynaska.

Read more at http://www.sspcr.eurac.edu/

6.3. SHDC featured in UABB 2019 exhibition – Multiple Sources

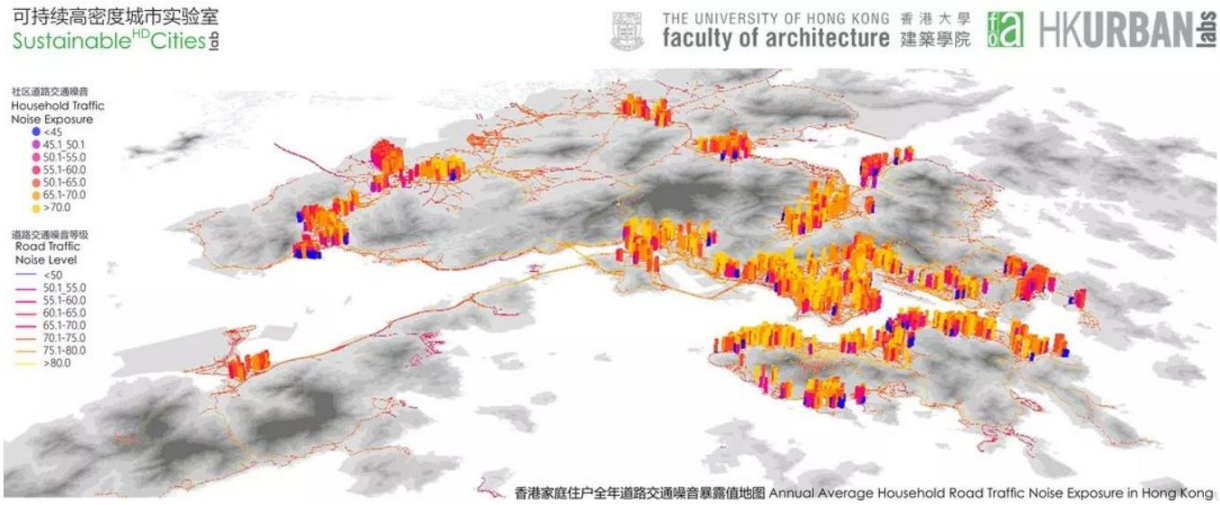
SHDC's exhibition at the Shenzhen-Hong Kong 2019 Biennale (Guangming) received media coverage from multiples sources.
Available at https://posts.careerengine.us/p/5dfc0fe990b11f19ee60d544
Available at http://static.scms.sztv.com.cn/ysz/zx/tj/28392751.shtml

09 /《可持续高密度城市: 连接研究与实践》

香港大学可持续高密度城市实验室

(Sustainable High Density Cities Lab)

数字时代的新兴智能技术，为规划人员提供了应对复杂性不断增长的城市的新机会。图为香港高密度城市交通噪音示意图（2009年度日间平均值），由参展机构提供。



6.4. Low-Carbon Green Buildings – Tencent News

Prof. Phil Jones, Dr. Jianxiang Huang, and Prof. Wenjing He are featured in a report by Tencent.net entitled: "Low-Carbon Village, Green Building – Sino-British Low Energy Healthy Rural Housing Experiment Platform in Zhujialin Garden Complex".
Available at https://new.qq.com/rain/a/20191030A006NP00

6.5. Laundromats as Social Space: The New York Times

Dr. Jianxiang Huang was interviewed by the New York Times on the use of laundromat as social spaces in Hong Kong
Available at https://www.nytimes.com/2018/04/03/world/asia/hong-kong-housing-prices-laundromats.html

The New York Times

HONG KONG JOURNAL

Why Laundromats Are the Hot New Place to Hang Out in Hong Kong

6.6. Tai Mountain Academic Forum – Shandong Jianzhu University

Dr. Jianxiang Huang was featured in news coverage of the Tai Mountain Academic forum by the Shandong Jianzhu University Press.

Available at https://www.sdjzu.edu.cn/hzfz/info/1031/2220.htm

新闻 首页 > 新闻

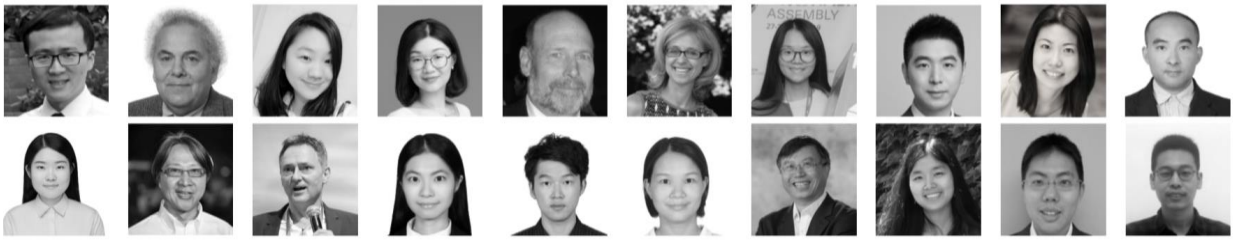
“2019年泰山学术论坛-智慧城市关键要素与核心驱动力专题”在山东建筑大学举行

信息来源： 作者： 审核人： 发布日期: 2019年12月08日 18:45 浏览次数: 5

12月7日，由山东省教育厅主办、山东建筑大学承办、齐鲁交通信息集团有限公司协办的“2019年泰山学术论坛——智慧城市关键要素与核心驱动力专题”在我校博学会堂举行。中国科学院院士、地图学与地理信息系统学专家周成虎研究员，国家万人计划科技创新领军人才、北京大学彭宇新教授，清华大学自动化系教授、山东建筑大学泰山学者赵千川教授，京东集团副总裁、京东数字科技首席数据科学家郑宇教授，东南大学交通学院副院长刘志远教授，香港大学可持续高密度城市实验室联席主任黄健翔教授，山东省泰山产业领军人才刘磊教授，齐鲁交通信息集团研发服务中心总经理常玉涛高级工程师，以及山东省国土测绘院、齐鲁交通信息集团、济南市勘测测绘研究院、浪潮智慧城市视频网联平台、泰华智慧产业集团、山东正元地球物理信息公司等全国各地的专家、学者和研究生近300人参加会议。本次学术论坛由山东省智慧城市协同创新中心、山东省智能建筑技术重点实验室具体承办。山东建筑大学校长靳奉祥出席论坛开幕式并致辞，副校长郭益灵主持开幕式。

7. Acknowledgement

SHDC thank staff, members and guests who contributed to the lab.



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- Prof. Chris Webster, Dean of Architecture
- Wei-Jen Wang, Professor, Department of Architecture
- Dr. Wei Pan, Department of Civil Engineering
- Dr. Michael Yuxuan Ni, School of Public Health
- Prof. Yuguo Li, Department of Mechanical Engineering
- Mr K P Cheung, Associate Professor, Department of Architecture
- Ms Juan Du, Associate Professor, Department of Architecture
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- Dr Nam Kyung-Min, Assistant Professor, DUPAD
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- Prof Stephen Lau, National University of Singapore
- Dr. Simos Yannas, Architectural Association
- Prof. John D. Spengler, Harvard University
- Dr. Jian Hang, Sun Yat-sen University
- Dr. Du Hu, Cardiff University
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- Ms. Yali Wang, UN Habitat, Climate Change Unit, Nairobi, Kenya

Happy New Year 2020!