INTERNATIONAL VIRTUAL CONFERENCE 2020 ON SPATIAL PLANNING AND SUSTAINABLE DEVELOPMENT

SPECIAL FOCUSED THEME:
COVID-19 LOCKDOWN URBANISM

FEBRUARY 6 - 7, 2021

International Scientific Committee

International Community of Spatial Planning and Sustainable development (https://www.spsdcommunity.org/)

Lockdown Urbanism

The ongoing pandemic has led to more than 100 million of confirmed cases and 2.16 million deaths of people globally (up to late January 2021). A variety of health and well-being issues resulting from the largest scale lockdown in the 21st century have addressed emerging global challenges for urban sustainability and smart city development: how to creatively design local neighbourhood and home in response to changing lifestyles? How to smartly design digital and social infrastructure to support individual adaption to changed life-styles? How urban governance and smart city deal with a variety of social, spatial and information inequalities? The multi-disciplinary and international discussion and debates on these timely questions help rethink the planning and governance of healthy city in the uncertain contexts.

V-Conference Organisers

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Guangwei HUANG, Sophia University

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Lan WANG, Tongji University

Qingming ZHAN, Wuhan University

Suhong ZHOU, Sun Yat-sen University

Guoping XIONG，Southeast University

Technical Team

Sandaru Weerasinghe, Manchester Metropolitan University

Huan Liu, Sophia University

Session:

Lockdown Urbanism: Spatial and Digital Adaption

Chair: Jianquan Cheng, Manchester Metropolitan University

Many countries have made and implemented disparate policies and measures to control the spread of the COVID-19 virus and manipulate its diverse health and socio-economic impacts during the ongoing pandemic. As the most popular measure, lockdown with varying degree of mobility and socio-economic activity restrictions between different stages has remarkably changed residents' living, working and other behaviour and habitats. To safeguard individual and family health and well-being, people have been spatially and digitally adapted to changing environments and lifestyles. This session aims to examine and compare the heterogeneous evidences and empirical studies on these spatial and digital adaptions and their impacts within the changing environment across multiple (spatial, temporal and social) scales. The evidences are used to conceptualise lockdown urbanism in the global context and comparative resilient practice.

References

T. Jefferies, J. Cheng, L. Coucill (2020) Lockdown Urbanism: Covid-19 lifestyles and liveable futures opportunities in Wuhan and Manchester. Cities and Health. (https://doi.org/10.1080/23748834.2020.1788771)

Cheng, J, Bannister, J. Special Issue "COVID-19 and Urban Inequalities: Spatial and Digital Dimensions", https://www.mdpi.com/journal/sustainability/special_issues/Urban_Inequalities

Session:

Lockdown Urbanism: Natural Disaster Management amid Covid-19 Pandemic

Chair: Guangwei Huang, Sophia University

Covid-19 has been with us since January 2020 and so much efforts have been made to control its spread. With limited success in controlling the virus on a global scale, large-scale flood disasters occurred in China and Japan, which presented a challenge to both flood managers and health care workers. How flood risk and covid-19 infection risk affect each other and how the two types of disaster can be managed at the same time are research questions this session is intended to address. Considering that our experience and knowledge for dealing with such a compound risk is limited, a session dedicated to this subject is timely and important. Therefore, this session welcomes general and specific contributions that address the assessment and management of multiple risks at the same time. Special attention will be given to those contributions that deal with flood emergency management amid the covid-19 pandemic in China and Japan.

Session:

Lockdown Urbanism: Accessibility to Services and Living Needs

Chair: M.Reza Parvizi, Eindhoven University of Technology

In late 2019, the cities faced the widespread coronavirus outbreak. The strict policies of urban quarantine became a goal to prevent the transmission of the global epidemic in urban communities. Suddenly, the access to all urban services and the living needs of residents were jeopardized. The provision of food and medicine, access to services and the basic needs became a large challenge for authorities, local governments, policymakers and urban planners. On the other hand, the rapid virus transmission in urban areas and the large number of human casualties affected the crisis in health care system's capacity and destroyed access to the living needs. The virus transmission risk through being in urban spaces has accompanied with the sound of the death knell in cities. As the access to basic needs of life via these spaces had the cost equivalent of illness and death for the residents.
This session aims to answer two main questions as follows;

1) How can we prepare cities to appropriate access to services and living needs for habitants during disease outbreak?
2) In time of epidemic crisis, how can we use all the capabilities and abilities of the city to meet the appropriate access to urban services and living needs?

Session:

Ecologic-resilience Spatial Planning of Land & Ocean Integration

Chair: Xiong Guoping, South East University

The intersection area of river and ocean is a geographical unit where the land and ocean systems are interconnected, compounded and intersected. It is an independent environmental system with the characteristics of land-sea transition and a dynamic interaction system between coastal land and offshore. It is the golden area for social and economic development and also the key area for the breeding of metropolises. Metropolises such as Shanghai, Guangzhou, Tianjin in China and Tokyo, Amsterdam in the west are all located in these areas. Due to the growing world population and accelerating urbanization, the intersection area of river and ocean is facing great pressure such as the global climate change, sea levels rise, regional ecological environment destruction, biodiversity reduction, pollution aggravation and fishery resource degradation, which seriously restrict the sustainable development of these areas. During the periods of public health events such as COVID-19, more attention has been paid to the spatial planning for these areas with dense population and frequent economic activity.

Discussing the territorial space planning for the intersection area of river and ocean from the perspective of ecological resilience, this theory and practice will provide guidelines for the development and protection of oceans, coastal zones, sea areas and islands, help carry out overall urban design and realize the optimal layout of the intersection area of river and ocean.

Session:

Lockdown Urbanism: Intra-urban Mobility Patterns and Contexts

Chair: Tatsuya Sekiguchi, Kanazawa University

We have spent daily lives with COVID-19 since the pandemic has occurred in Japan at the beginning of 2020. After the pandemic, against people has been taking various actions in order to prevent the infection to others or themselves. It drastically changed their behaviors in daily lives.

In these situations, various social problems have been happened such as the damage to specific types of industry or the panic buying phenomena.

For improvement and future prevention of such problems, it is important to consider appropriate countermeasure by understanding the details about how the pandemic has changes people's various behaviors in daily lives.

This session aims to examine the people's daily behavior changes across multiple spatial and temporal scales by focusing on Japanese cases. The reports and discussions based on the same cultural and political contexts will enable us to find the common, characteristic patterns or principles of people's behaviors. It will help us not only to make the ideas of countermeasures in one country but also to give useful implications that can be applied in other countries.

Session:

Lockdown Urbanism: Promoting Resilient Governance in Dealing with the Covid-19 Pandemic

Chair: **Nabil Menhem, Planning Institute of ALBA**

Understanding the impacts of the Covid-19 pandemic on urban governance and territorial reorganization; Exploring the right scale of intervention from urban planning and governance perspectives Since its outbreak, the Covid-19 pandemic has left many governments, metropolitan agencies, local authorities, professional communities, civil societies and even individuals in different parts of the world grappling each on their own with devising improvised responses and solutions that could not rise to the level of a shared holistic containment strategy. This was globally attributed to a lack of preparedness, inadequate governance structures, unclear and conflicting prerogatives and agendas between different institutions and sectors, inappropriate fund allocations, and shortage of communication protocols both horizontally and vertically.

This session will address questions of building better response mechanisms that could foster resilience through adaptive and inclusive governance structures crafted at the right scale. It will therefore tackle issues related to setting coordination protocols between actors from different sectors and the necessary territorial reorganization to promote agility and flexibility in

dealing with the Covid-19 shock (or similar ones) and its socio-economic and spatial implications on the short, medium and long terms.

Session:

Lockdown Urbanism: Health Effects of Multidimensional Spatiotemporal Environmental Exposure

Chair: **Suhong Zhou and Zhong Zheng, Sun Yat-sen University**

The outbreak of COVID-19 has raised new challenges for the attainment of healthy cities. Hitherto the implementation of the Health City strategy has focused on reducing those factors known to negatively affect public health in urban areas, namely; environmental pollution, traffic congestion, imbalanced public service supply and public disorder in built-up and social environments. In the post epidemic era, it is necessary to rethink the interactions between human activities and restricted urban environments and their health impacts. Specifically, how do we measure, analyse and model the health risks of environmental exposure to COVID-19 in different contexts, explore the systematic mechanism of environmental exposure on public health, and evaluate the impact of spatiotemporal and social heterogeneities on social equity? Discussion of these questions will contribute to a theoretical framework and provide evidence-based good practice guidance for environmental planning and design and the allocation of medical resources.

This session focuses on, but is not limited to, the following topics: measurement of urban environmental exposure; spatiotemporal patterns of disease and wellbeing; environmental exposure and health risks; spatiotemporal constraints on active health behaviour; spatiotemporal accessibility of medical services, green and public spaces and its social equity; managing environmental exposure; and big data and AI applications for data collection, analysis, modelling and participation.

Session:

Lockdown Urbanism: Towards Sustainable Spatial Planning for Human Health and Emotional Wellbeing

Chair: **Bin Jiang, University of Gävle**

It has long been recognised in the literature that environments have significant impacts on human health and wellbeing. A good space has a positive impact and evokes feelings of pride, belonging, wellbeing or healing, whereas a bad space has a negative impact and evokes feelings such as anxiety, discomfort, or unease. That said, Mehaffy & Salingaros (2020) somewhat surprisingly found that some Russian women who were exposed to the 1986 Chernobyl nuclear disaster seemed to enjoy better health than those were evacuated and relocated to other industrial-modernist spaces. It was not that the radiation was not harmful, but that the women's living structure (Alexander, 2002–2005; Jiang, 2019) engendered good feelings that seemed to overcome the radiation damage. In this session, we are interested in papers that contribute to a better understanding of sustainable spatial planning for promoting human health and wellbeing. Relevant key words include, but are not limited to, living structure, space syntax, smart cities, biophilia, fractals, and design patterns.

Interested authors are welcome to contribute their full paper(s) to the special issue before or after the SPSD conference:
https://www.mdpi.com/journal/smartcities/special_issues/defining_debating_smart_cities_smart_buildings

References:
Alexander C. (2002–2005), The Nature of Order: An essay on the art of building and the nature of the universe, Center for Environmental Structure: Berkeley, CA.
Jiang B. (2019), Living structure down to earth and up to heaven: Christopher Alexander, Urban Science, 3(3), 96, https://www.mdpi.com/2413-8851/3/3/96.
Mehaffy M. W. and Salingaros N. A. (2020), The Chernobyl paradox: The intense connection between health and living structure, Common Edge, https://commonedge.org/the-chernobyl-paradox-the-intense-connection-between-health-and-living-structure/.

Session:

Lockdown Urbanism: Managing Mega Events and Event-led Urban Development amid the Covid-19 Pandemic
Chair: **Yawei Chen, Delft University of Technology**

Event-led urban development or event-led regeneration has become part of a deliberate urban policy to position the host cities on the world agenda. Event host cities have the intention of creating a series of physical, economic and social benefits. Due to the Covid-19 pandemic, most of the world's large-scale sports and cultural events have been cancelled or postponed. Several questions have emerged from the current mega event research:

What actions can be taken to help mega-events recover from the interruption?
What should be done to help host cities resume mega event business?
What spatial, economic, financial, managerial and social interventions can host cities explore to embrace changes to future mega events and pursue event-led regeneration?

Considering the lengthy interruption to mega event business, tourism and event-led urban development during the pandemic and the consequent impact on stakeholders involved in related local tourism and the retail sector, a session dedicated to this subject is necessary and timely. This session welcomes general and specific contributions that address challenges to mega events during the pandemic. Special attention will be given to understanding physical, financial and managerial challenges and which scale of intervention from an urban planning or governance perspective will ensure that event-led urban development/regeneration creates a sustainable urban legacy.

Session:

Lockdown Urbanism: Activity Space and Spatial Behaviour

Chair: **Lan Wang, Tongji University**

In density-susceptible epidemics like COVID-19, cities are at significant risk due to the high population density and limited open spaces. The social isolation and restriction policies adopted in many cities to battle against the spread of the virus have led to adverse impacts on the mental and physical health of urban residents. One of the new challenges we face is to maintain liveability in cities during lockdown, including opportunities for everyone to do physical exercise and lead an active lifestyle, especially those with financial difficulties who lack adequate activity space and sanitation to stay healthy and social distanced. The exercise needs of different groups at multiple urban scales should be accounted for. After the closure of stadiums, sports centres, parks and playgrounds, governments could consider planning and designing barrier-free, safe and nearby outer spaces that provide equal opportunities for physical activity whilst minimising the risk of disease transmission.

This session will address the following questions:

How can we provide sufficient spaces for physical activity without increasing the risk of exposing urban residents to a virus like COVID-19?

What measures could be implemented to design existing activity spaces and transformable outer spaces (like streets closed to cars) to enable residents to exercise safely?

Session:

Lockdown Urbanism: Public Perceptions of Urban Climate and Environmental Change during Lockdown

Chair: **Qingming Zhan Wuhan University**

The Covid-19 pandemic has provided a unique opportunity to observe the urban climate and environmental change during lockdown conditions. Lockdown has created an environment in which people stay at home, factories and shops are closed, and traffic has ceased. It is interesting to know how urban climates and environments have changed as a result of such a large-scale lockdown and to investigate public perception of these changes. The increase in public awareness of such changes helps public participation in local urban sustainable development. This evidence allows planners to understand the interaction and relationship between human activities and the natural environment, particularly within critical and uncertain contexts. This session welcomes empirical studies and evidence of climate and environmental change outcomes and their impacts on public perceptions and awareness.

Session:

Lockdown Urbanism: Spatio-social Patterns of Crime during Lockdown

Chair: **Lian Duan, Nanning Normal University**

The lockdown measures introduced during the ongoing COVID-19 pandemic have greatly reduced socioeconomic vitality, and have changed individual and collective patterns of mobility, social interaction, work and living behaviour. These abrupt changes have reduced the incidence of common crimes, such as theft, robbery and rape etc., but have led to the increase of less common crimes, e.g. domestic violence, diffusion of mis-(dis) information (e.g. concealment of COVID-19), selling fake goods and fraud etc. Digital infrastructure developed to combat COVID-19 (e.g. health QR codes), has, as a secondary consequence, helped to detect criminal suspects identified by increasing the capacity to record the detailed movement of individuals over a large scale. This session seeks to analyse, model, examine, and compare the spatial and temporal influences of COVID-19 lockdown on crime patterns and corresponding processes in various social contexts. Empirical case studies and data driven evidence will enable us to understand the relationship between lockdown and crime in uncertain and dynamic geographical contexts. The findings will contribute to the theoretical development of effective crime countermeasures in response to large-scale public heath disasters. This session focuses on but is not limited to the following topics: the spatiotemporal distribution characteristics of emerging crimes; the dynamics of crime spatial flows before and after lockdown; the impacts of lockdown on the spatiotemporal agglomeration of crimes; comparative studies of crime patterns between home, neighbourhood and urban levels; the growth and casual factors of illegal social activities (e.g. family and neighbourhood parties) across space and time; and the critical role of digital technologies in crime detection and prevention.

Keynote Speakers

Prof Peng Jia
Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University. International Institute of Spatial Life Course Epidemiology (ISLE)

Applications of Spatial Life Course Epidemiology in COVID-19 research

Abstract:

Spatial life course epidemiology is an emerging discipline that utilizes advanced spatial, location-based, and artificial intelligence technologies to investigate the long-term effects of environmental, behavioural, psychosocial, and biological factors on health outcomes and the underlying mechanisms. During the COVID-19 pandemic, spatial life course epidemiology has been identified as a promising approach for precision control and prevention of the disease in the future. It can help better understand the epidemic course in order to improve epidemic forecasting. It can also help upgrade the current national notifiable disease reporting system into an intelligent syndromic surveillance system, with which early risk could be identified on the basis of information about patients' symptoms during the early phases of illness.

Prof Tom Jefferies
School of Natural and Built Environment, Queen's University Belfast

Lockdown Urbanism: Global reflections on COVID-19 at work, rest and play

Abstract

Collected personal experiences form the basis of this commentary, critically contrasting global urban contexts and COVID-19 restrictions. Case studies in China, England, Northern Ireland, India and the USA, are a lens, used to examine significant changes in spatial reach and the lockdown reconfiguration of public and domestic space. This extends early lockdown observations undertaken in Lockdown urbanism: COVID-19 lifestyles and liveable futures opportunities in Wuhan and Manchester (1). Focusing on latency, the capacity to fit new occupation patterns and uses into existing places, the role of architecture and urbanism is considered. This identifies applicable physical and digital environment design lessons, in a variety of scales and media that support flexible, creative and resilient patterns of future liveability. With massive externally induced change, what stays, what shifts, what disappears? How are patterns of use and movement, both daily and longer term, affected and changed? Through considering spatial adaptability and resilience in comparative contexts, design-based questions identify possible thematic responses addressing resilient liveable future urbanism. This reflects on the similarities and differences between global lockdown experiences, and the concept of mental as well as physical lockdown.

Tom Jefferies, Jianquan Cheng & Laura Coucill (2020): Lockdown urbanism: COVID-19 lifestyles and liveable futures opportunities in Wuhan and Manchester, Cities & Health, DOI: 10.1080/23748834. 2020.1788771

Prof Ge Lin

Department of Epidemiology and Biostatistics, School of Public Health, University of Nevada Las Vegas

Impacts of School Reopening Policies and School District Size on COVID-19 Spread in School Siting in the US

Abstract

Face with different COVID-19 risk in the fall of 2020, different reopening models were implemented to bring students back to schools. The hybrid learning model was considered as a mid-risk option compared with remote learning and in-person learning models. Using crowdsourced data that report school-based COVID-19 cases or outbreaks, we assess COVID-19 case growth rates from August 10 to Oct 20 in the US by following more than 10% school districts in the US. The baseline exposures were three teaching models--remote learning only, hybrid, and in-person learning. Controlling school district COVID-19 background-risk, the hybrid learning model had highest case-growth rate, and the remote had the lowest. Although high density school had higher case growth rates overall, the basic results about school reopening policies were consistent. The hybrid may not necessarily be the next logical option when transitioning from the remote to in-person learning models, since it had higher case growth rates in high and low-risk districts.

Prof Qingming Zhan
School of Urban Design, Wuhan University

Tracking COVID-19 and Restoration through Transport Accessibility and Mobility Analysis

Abstract

This talk aims to discover possible ways of limiting the scale of mobilization and social regulation when in the early stage of an epidemic. First, the records of early regional transmission of COVID-19 are analysed in spatial-temporal terms. They reveal a very short window of opportunity for limited response due to rapid regional spread and inevitable delay of case confirmation, and that a reliable real-time evaluation of probable affected areas is necessary immediately after discovering the epidemic. Then, population flow before and after the lock-down of Wuhan city is compared with the relevant transportation networks, finding that transportation routes can be an important factor in evaluating epidemic-affected areas. Based on these findings, we propose an iterative approach combining potential traffic routes and population flow, to locate cities and transportation routes to be restrained before a full-scale response become inevitable. We also monitored and analysed the restoration process of the post-epidemic of COVID-19 in Wuhan in 2020 based on mobility data in order to assess the effectiveness to the Lock-down and other measures in Wuhan.

Prof Bin Jiang
Faculty of Engineering and Sustainable Development, Division of GIScience
University of Gävle

Spatial Healing: Bridging Space and Place through the Concept of Wholeness

Abstract

This presentation is intended to bridge together two separate concepts – space and place – through the very concept of wholeness. Space is external to our body and mind, while place is how space is experienced in our heart and mind, so it is internal. Wholeness (or living structure) exists physically in our surrounding (just like air), can be defined mathematically, and well reflected in our heart and mind psychologically. The term "spatial healing" has two different meanings: the healing effect of good space on people on the one hand, and space to be healed to become living or more living on the other. A key message of this presentation is that there is a shared notion of the goodness of space or place among peoples regardless their cultures, faiths, and ethnicities. The goodness of space is largely determined by the underlying living structure that consists of numerous substructures. A general rule goes like this: the more substructures, the more beautiful; the higher hierarchy of the substructures, the more beautiful.

Keywords: Living structure, wholeness, emotional well-being, healing, Covid-19

The Zoom system links to be used to attend the conference:

5-7 February 2021 (9am – 9pm Beijing Time)	Virtual Room A	Virtual Room B
Meeting ID	932 6861 1598	960 0694 8547
Passcode	533318	481336
Zoom link	https://sophia-ac-jp.zoom.us/j/93268611598	https://sophia-ac-jp.zoom.us/j/96006948547

SPSD VC 2020 Timetable (5 - 7 February 2021)
Special Focused Theme: Lockdown Urbanism

Venue	Time	Event / Session	Session Chair
		5 February (Friday) (Beijing, GMT+8)	
Virtual Rooms A/B	11:00 –14:00 16:00– 19:00	Zoom System testing	Technical Team
		6 February (Saturday) (Beijing, GMT+8)	
Virtual Room A	8:00-9:00	Academic/ Technical questions	Technical Team
Virtual Room A	9:00-9:30	**Opening Ceremony by Prof Zhenjiang Shen** (SPSD)	Prof Guangwei Huang
Virtual Room A	9:30 – 10:00	**Keynote speech by Prof Peng Jia** Application of spatial life-course epidemiology in COVID-19 research	Prof Guangwei Huang
Session 1:		**Intra-urban mobility patterns and contexts**	
Plenary Session Virtual Room A	10:20-10:40	**Ahmed Derdouri** EPIDESKTOP: A GIS-based platform for simulating COVID-19 spread and human mobility trends in Tokyo, Japan	Prof Jente Pai
	10:40-11:00	**Moon-Hyun Kim** How did travel mode choices change according to Coronavirus Disease 2019? Lessons from Seoul, South Korea	
	11:00-11:20	**Garavig Tanaksaranond, Peraphan Jittrapirom** An exploratory survey on the perceived risk of COVID-19 and travelling	
	11:20-11:40	**Tatsuya SEKIGUCHI** Shopping behaviour and awareness during COVID-19-related panic buying - a case study conducted in three Japanese cities	
	11:40-12:00	**Kajol James, Aparna Sathish** Resilient pattern-based alternatives for Public Transport Infrastructure	
	12:00– 12:20	**Jente Pai** The mobility fluctuation trend analysis during pandemic period: the case of Taiwan	
	12:20– 12:50	Comments and Q/A	Discussant: Prof Tatsuya Sekiguchi

Session 2: Health effects of multidimensional spatiotemporal environmental exposure (& Natural disaster management amid Covid-19 pandemic)			
Plenary Session Virtual Room B	10:20-10:40	**Xue Zhang** Geographic ecological momentary assessment (GEMA) of environmental noise annoyance: the influence of activity context and the daily acoustic environment	Dr Zhong Zheng
	10:40-11:00	**Junyi Hua** Spatiotemporal assessment of extreme heat risk for high-density cities: A case study of Hong Kong	
	11:00-11:20	**Wiwandari Handayani** What policies help to prevent Covid-19 in Indonesia? A comparative analysis of selected urban agglomerations	
	11:20-11:40	**Min Gao, Jianquan Cheng** Exposure to Medical Street Advertisements (MSA): Emotional and behavioural impacts	
	11:40-12:00	**Cheng Sun** How COVID-19 and campus lockdown policies contribute to the inequality of green space accessibility? Evidence from university campuses in Wuhan	
	12:00– 12:30	Comments and Q/A	Prof Suhong Zhou
Break	12:30– 14:30		
Virtual Room A	14:30– 15:00	**Keynote speech by Prof Tom Jefferies** Lockdown Urbanism: global reflections on COVID-19 at work, rest and play	Dr Jianquan Cheng
Session 3: Towards Sustainable Spatial Planning for Human Health and Emotional Wellbeing			
Plenary Session Virtual Room A	15:20-15:40	**Chenhui Wu, Jianqan Cheng** Health-related quality of life of hospitalized COVID-19 survivors: an initial exploration in Nanning City, China	Dr Jianquan Cheng
	15:40-16:00	**Ozge Ogut** Urban health quality after the Pandemic: potentiality of assessing urban infrastructures on public health from existing database: the case study of Milan city centre, Italy	
	16:00-16:20	**Neghah Hosseini Ojagh, Fariba Seyedan** What have we learned from COVID-19? a theoretical discussion toward sustainable spatial planning for human wellbeing in dealing with wicked pandemic	
	16:20-16:40	**Ka Yin Ho, Hao Huang** Analysing structural factors influencing the vulnerability of hispanic community to COVID-19: A case study in Chicago	
	16:40-17:00	**Chao Yin** Modelling and analysing 3D urban colourscapes to support environmental design	
	17:00– 17:30	Comments and Q/A	Discussant: Prof Bin Jiang

		Session 4: Spatial and digital adaption	
		Session 4: Spatial and digital adaption	
Plenary Session Virtual Room B	15:20-15:40	**Kenichi Sugihara** Automatic generation of double leaned roof model for smart Houses	Dr Zhong Zheng
	15:40-16:00	**Respati Wikantiyoso** Rural tourism destination spatial interventions face the risk of COVID-19 infection. case study: Kampong Boenga Grangsil tourism destination, Dampit District, Malang Regency	
	16:00-16:20	**Faezeh Behnamifard** Cooperation of ordinary citizens with urban management in the third wave of Covid-19 outbreak in Iran: based on personal and socioeconomic characteristics of citizens	
	16:20-16:40	**Rim Meziani, Aya Alkhatib, Maya Wacily** COVID-19 and resilient cities -case study of Abu Dhabi	
	16:40-17:00	**Mitchell de Sousa** The popular economy and its outcomes in times of COVID-19: a study of the centralities of the popular sectors and the role of the municipal state in the city of Trelew, Argentina	
	17:00– 17:20	**Yong Lin** How Universities Use Personal Information to Ensure Education and Management Quality During the COVID-19 Pandemic: A Case Study of Universities in Fujian, China	
	17:20– 17:50	Comments and Q/A	Discussant: Dr Jianquan Cheng
		7 February (Sunday) (Beijing, GMT+8)	
Virtual Room A	9:00-9:30	**Keynote speech by Prof Ge Lin** Impacts of school reopening policies and school district size on COVID-19 spread in school siting in the US	Prof Guangwei Huang
Virtual Room A	9:30 – 10:00	**Keynote speech by Prof Qingming Zhan** Tracking COVID-19 and restoration through transport accessibility and mobility analysis: a case study of Wuhan	Prof Guangwei Huang
Session 5:	Activity space and spatial behaviour (& Spatio-social patterns of crime during lockdown)		
Plenary Session Virtual Room A	10:20-10:40	**Heejin Oh** Correlates with the choice of urban spaces in the COVID-19 era	Prof Lian Duan
	10:40-11:00	**Sutee Anantsuksomsri** Social capital and food vendor business during COVID-19 pandemic: a case study of Chinatown in Bangkok	
	11:00-11:20	**Tsolmon Bayrsaikhan** Leisure behaviour changes by COVID-19 in an Asian metropolitan area: analysing the impact of risk perception regarding destination choices	

	11:20-11:40	**Yonghoon Son** Changes in the perception and behaviour of urban green spaces after COVID 19 by the types of greenery in South Korea	
	11:40-12:00	**Sutee Anantsuksomsri** Carbon sequestration analysis of university campuses in the Bangkok Metropolitan Region using geo-informatics Technology	
	12:00– 12:30	Comments and Q/A	Discussant: Prof Lan Wang

Session 6:   Public perceptions of urban climate and environmental change during lockdown (&Ecologic-resilience Spatial Planning of Land & Ocean Integration)

Plenary Session Virtual Room B	10:20-10:40	**Zhi Cai** Exploring the impact of COVID-19 on urban thermal environment	Prof Guoping Xiong
	10:40-11:00	**Yunhao Fang** Exploring coupling effect between urban heat island effect and PM2.5 concentrations from the perspective of spatial environment	
	11:00-11:20	**Jinjing Hu** The impact of development intensity on its spatial sustainable development: a case study of ecologically fragile areas	
	11:20-11:40	**Lin Tao** Ecological network analysis and construction between land and ocean: A case study in the economic development zone of Gulei Port, China	
	11:40-12:00	**Guoping Xiong** Research on Spatial Form of Coastal Zone in the Intersection Area of River and Ocean	
	12:00– 12:30	Comments and Q/A	Discussant: Prof Qingming Zhan
Break	12:30– 14:30		
Virtual Room A	14:30– 15:00 (GMT+8)	**Keynote speech by Prof Bin Jiang** Spatial healing: bridging space and place through the concept of wholeness	Dr Jianquan Cheng

Session 7: Towards Sustainable Spatial Planning for Human Health and Emotional Wellbeing (& Accessibility to services and living needs)

Plenary Session Virtual Room A	15:20-15:40	**Jiwon Lee** How did people's visit to urban spaces affect the perceived risk of Coronavirus Disease 2019 infection?	Dr M.Reza Parvizi
	15:40-16:00	**Wenjing Luo** How to integrate urban health into planning urban public amenities in innovation districts: case study of the Optical Valley, Wuhan, China	
	16:00-16:20	**Siyu Zhang, Hao Huang** The moderate effects of food environment and obesity on COVID-19	
	16:20-16:40	**Jiayuan Bai**	

		Assessing the spatial equality in access to primary care services for the elderly: a comparison of urban-rural data in China	
	16:40-17:00	**Sandaru Weerasinghe** Measuring the fear of crime to support healthy street environmental design	
	17:00– 17:30	Comments and Q/A	Discussant: Prof Bin Jiang

Session 8: Promoting Resilient Governance in Dealing with the Covid19 Pandemic (&Managing mega events and event-led urban development amid the Covid-19 pandemic)

Plenary Session Virtual Room B	15:20-15:40	**Jun Hu, Jianquan Cheng** Is COVID-19 lockdown in Wuhan a self-organising process?	Dr Yawei Chen
	15:40-16:00	**Tianyao Zhang** Exploration of healthy community governance in China: a case study of epidemic prevention for COVID-19.	
	16:00-16:20	**Xin Yan, Haixian Xu** Discussing role of major central towns in constructing urban-rural resilience network	
	16:20-16:40	**Yawei Chen** The future of mega event in post COVID-19 pandemic: opportunity for creating event legacy towards a resilient path?	
	16:40-17:00	**Chryssa Martini, Nerantzia Tzortzi** The mega events during Covid-19 pandemic: the case study of European Capital of Culture, Eleusis 2021	
	17:00– 17:30	Comments and Q/A	Discussant: Dr Nabil Memhem
Session 9	17:30-18:00	Conference summary and post-conference publication	Dr Jianquan Cheng and Prof Guangwei Huang
Session 10	18:00-18:20	Closing session and SPSD 2021	Prof Feng Zhen (China)

List of Abstracts of Oral Presentations

(Sort by surname of the first author)

Cooperation of Ordinary Citizens with Urban Management in the Third Wave of Covid-19 Outbreak in Iran: Based on Personal and Socio-economic Characteristics of Citizens

Mehran Alalhesabi *, Iran University of Science and Technology (IUST)
Mostafa Behzadfar, Iran University of Science and Technology (IUST)
Faezeh Behnamifard, Iran University of Science and Technology (IUST)

Abstract: Since the beginning of the Covid-19 outbreak, governments worldwide have imposed various restrictions on their citizens in a bid to stop the spread of this virus. A common factor in these policies' success is the adaptation of ordinary citizens to epidemic conditions and their cooperation with urban management in adhering to these precautionary measures. Otherwise, the disease's incidence and death rates in the countries will not end. The situation that has occurred in Iran since the beginning of September and a sudden rise has put this country at the top of the daily reported deaths of Covid-19 (in proportion to the population) in October and November. Therefore, this study intends to focus on Iran's two important metropolises (Tehran and Karaj) to understand: 1) What is the level of citizens' cooperation in complying with Covid-19-related precautionary measures? 2) How has the level of citizens' precautionary behaviors changed compared to the early days of the outbreak? 3) Which personal and socioeconomic factors affect their cooperation in this field? This is a cross-sectional study based on online surveys (completion of 667 online questionnaires by ordinary citizens living in Tehran and Karaj). Findings show the participation of 30.3% in implementing all precautionary measures, with women, high-income groups, unemployed people, and those without a history of Covid-19 infection having a higher odds ratio than others. In terms of citizens' behavior, 21% have reduced their level of cooperation in this area, which is correlated with their personal and socioeconomic characteristics (except their city of residence).

Key words: Covid-19 Pandemic, Citizen Behavior, Citizen Cooperation, Social Distancing Restrictions, Adherence

Carbon Sequestration Analysis of University Campuses in the Bangkok Metropolitan Region using Geo-Informatics Technology

Sutee Anantsuksomsri, Chulalongkorn University
Nij Tontisirin, Thammasat University

Abstract: In 2015, Thailand submitted its Nationally Determined Contribution (NDC) report to the United Nations Framework Convention on Climate Change (UNFCCC), which outlines Thailand's NDC targets and action plans for achieving the NDC targets. For the NDC targets, Thailand intends to reduce its greenhouse gas emissions by 20% from the projected business-as-usual level by 2030. As population and pollution continue to grow in the city, urban forests play increasingly important roles in sequestering atmospheric carbon, trapping air, reducing heating and cooling costs, as well as, providing recreational spaces and other ecosystem services. Despite such important roles, the area of urban forest has sharply declined in developing countries, and even in Thailand due to a lack of incentives for conservation.

Most of the Thailand university campuses largely covered by trees or urban forests. As urban forests play increasingly important roles in sequestering atmospheric carbon, trapping air, reducing heating and cooling costs, as well as, providing recreational spaces and other ecosystem services. In addition, a green university is one of the initiatives to create an urban forest in a city. The UI Green Metric World University Ranking, launched in 2010, is one of the university ranking programs focusing on the current condition and policies related to Green Campus and Sustainability in the Universities all over the world. It is expected to draw the attention of university leaders and the public on the environment and global climate change. The focus of this study is on the carbon sequestration analysis of university campuses in the Bangkok Metropolitan Region (BMR). Geo-informatics technology and remote sensing data will be used to calculate the performance of urban forests in university campuses on the reduction of carbon emission in the BMR.

Assessing the Spatial Equality in Access to Primary Care Services for the Elderly: A Comparison of Urban-rural Data in China

Jiayuan Bai, Dalian University of Technology
Wei Lu, Dalian university of technology
Guangzi Wang, Dalian University of Technology

Abstract: China has just established a city-community secondary triage healthcare system and begun to vigorously develop primary care facilities in the community to promote the transformation of a healthy aging society. The purpose of this study is to assess the spatial equality in access to primary care services by the elderly in order to identify the area where services are scarce. Dalian, an aging (36.9%) city in China as the research object, using geographic data from primary care facilities (including public community hospitals and private clinics), residential environment data, and transportation network data. The weighted TOPSIS model was used to assess various indicators that reflect the supply-demand balance of primary care services in different districts and using a systematic spatial clustering method to identify the areas where the elderly have poor access to primary care. Our results show that the supply of primary care in severely aging areas is larger than other regions, but there is still a big gap in meeting the elderly`s requirement of service, which affected by population structure and immigration. In addition, compared with the public community hospitals, private clinics` distribution is very uneven and the degree of spatial agglomeration between regions is negatively related to the aging rate, this may be linked to the impact of commercial conditions on the clinic`s location. The research can provide evidence for the government in allocation decision-making of community hospitals facing an aging society.

Leisure Behaviour Changes by COVID-19 in an Asian Metropolitan Area: Analysing the Impact of Risk Perception regarding Destination Choices

Tsolmon Bayarsaikhan, Graduate School of Environmental Studies,
Seoul National University
Tae-Hyoung Tommy Gim, Graduate School of Environmental Studies,
Seoul National University

Abstract: The COVID-19 has changed tourism and leisure patterns. Prior to the pandemic, people tended to prefer complex facility-based indoor leisure activities due to climate issues such as fine dust and extreme weather, but now, it has been changed to open space-based outdoor leisure activities pattern. Thus, it is necessary to understand how people's travel and

leisure behaviours have changed during the COVID-19 pandemic. In particular, it is not clear on how individuals' COVID-19-related perception influences their leisure destination choice behaviour. This empirical study aims to confirm the relationship between risk perception of COVID-19 and choice of leisure destination due to COVID-19 and to explore any differences between them related to demographic characteristics. The online survey was conducted targeting citizens of the Seoul, Metropolitan Area, South Korea. The findings from regression analysis show that significant effect of the risk perceptions of COVID-19 on the choice for leisure destination in Seoul Metropolis. Hence, these findings suggest that the risk perceptions of COVID-19 considered as one among the important factors influencing the individual's behaviour on destination choice for leisure activities. Furthermore, this study also provides several implications for urban leisure spaces planning and management after the COVID-19 pandemic.

Urban Health Quality after the Pandemic: Potentiality of Assessing Urban Infrastructures on Public Health from Existing Database: The Case Study of Milan City Centre, Italy

Chiara Bertolin, Norwegian University of Science and Technology
Nerantzia Tzortzi, Politecnico di Milano
Ozge Ogut, Politecnico di Milano

Abstract: With Covid-19, the inevitable relation between human health and the structure of the cities has been realized dramatically. There are several parameters to evaluate this relation: environmental factors such as wind conditions, and air pollution; urban parameters that represent the built environment, and their integration with the blue and green components of urban areas. A big majority of pandemic deaths occur in urban areas where there are high air pollution levels. Airflow conditions and wind speed might help or prevent air pollution plumes. In addition, all these factors affect each other and are directly related to the organization of architecture, morphology, and built environment. Some cities have already begun to take actions to slow down the spread: to consider social distances in urban life, to build shelters for homeless people. However, these solutions are temporary and not efficient on a long-term since they must be rethought in different scales. On a wider scale, particulate matters are mostly produced by human activities and can move long distances in the atmosphere and cause many diseases. Particulate matters carry solid particles and liquid droplets including several chemical and biologic pollutants like some viruses. Lockdown, and stopping industrial activities are beneficial to reduce air pollution. But this reduction is not guaranteed to continue since these restrictions are not forever and there are other reasons like the combustion of fuel for the heating of buildings, traffic, ammonia in agricultural fertilizers, etc. To mitigate risky situation for human health. It is needed to take preventive action before the spread of viruses. The design of environmentally built areas, its composition with open public spaces, green and blue infrastructure can be an effective tool. In this way, with design solutions such as green walls, there would be contributions to improve public health and wellbeing.

Exploring the Impact of COVID-19 on Urban Thermal Environment

Zhi Cai, Tsinghua University
Qingming Zhan, Wuhan University
Yan Tang, Tsinghua University

Abstract: In early 2020, the outbreak of COVID-19 caused numerous cities to lockdown. Due to the city-wide lockdown, most of the outdoor activities have stopped, residents were confined to stay at home, no one relaxing in the park or wandering on the square, and scatter cars running on the street, the city looks 'empty'. Moreover, to cut off the spread of the virus, shopping stores, restaurants, factories were also closed. Those changes caused a significant change in human activities, and the amount of energy consumption, it also except to have a great impact on the anthropogenic heat release and urban thermal environment. Therefore, in this paper, we selected two megacities in China as a case study, and compared their urban thermal differences before and after the city-wide lockdown from the urban land use perspective. To further identify the impact of human activities on the urban thermal environment, the correlations between population density changes and LST differences have also been analyzed. The results showed that the urban thermal environment has decreased both in Beijing and Wuhan city since the lockdown. The updated regression model illustrated that the thermal differences were mainly driven by land cover, while human activities have little impact on it. The changes of urban thermal environment were also various in different urban land use in Beijing and Wuhan city, due to the different spatial distribution of populations. Those findings can help us better understanding the mechanism of the urban thermal environment, and providing support for addressing some public health issues that relate to the thermal environment.

The Future of Mega Event in Post COVID-19 Pandemic: Opportunity for Creating Event Legacy towards a Resilient Path?

Yawei Chen, Delft University of Technology

Abstract: Mega-events have been explored by cities for urban reimaging and urban transformation process. Because of the scale and the complexity, mega-events are great opportunities for cities to showcase local culture and create opportunities for the local economy, local tourism and retail sector and a catalyst for urban regeneration. The current COVID-19 pandemic has created a global crisis of unprecedented scale. Several extreme measures have been deployed to avoid contagion risk, including city lockdown, residents subject to COVID-19 quarantine and social distance, closure of tourism attractions and retail sector, as well as travel restriction. Both sport and cultural events attract a large congregation of people, in term of staffing, stewarding, fans and general public crowds. As a result, this global crisis created a temporary shock on large-scale travel, tourism sector and mass gathering resulting in the cancelling or postponing of almost all mega-events in 2020. As the pandemic continues, the future of mega event as well as how cities carry on event-led development to create a positive urban legacy cast in doubt.

This paper attempts to understand what challenges cities need to address to accommodate current suspended mega events in post-pandemic by taking into contagion risk. The critical spatial elements key to mega events will be discussed, including venues or exhibition halls, facilities, public space for event sites and related infrastructure. Beyond the temporary challenges mega-events face, this paper will examine how currently pandemic may impact on the understanding of future proof legacy creation. The focus of mega-event development in the long terms is how cities use the opportunity to develop a future-proof resilient urban area.

The constrain of the urban area under the influence of neo-liberal growth-oriented strategies will be addressed. Finally, the paper discusses what strategies can tap the potential of mega-event as a catalyst for urban regeneration but restrain the curtails of current event-led regeneration and their policy implication.

The Popular Economy and Its Outcomes in Times of COVID-19: A Study of the Centralities of the Popular Sectors and the Role of the Municipal State in the City of Trelew, Argentina

Mitchell de Sousa, University of Buenos Aires

Abstract: The COVID-19 impacted roughly Argentina's economy, and it is keeping on doing so as we speak. The popular economy in the city of Trelew has been historically reproducing their economies in the public space. As the measurements get restricted, so are the control over the territory of the municipal state. These local governments were, up until now, passive actors towards the informal occupations in the city, however since the rise up of the cases, their role turned actively. The control of the pandemic in different municipalities also depends on how they manage their territories.

Interestingly, as for Trelew, the local government kept the popular sectors' economic dynamics throughout virtual platforms operated by the state. The municipalities regained particular territorial appropriation of the land that was once in constant conflict with the government. Indeed, this process recovered the discussion of whether or not the state's participation should be relevant to face the pandemic's impacts or if such actions are, moreover, territorial control over the space by the different actors that build territorial dimensions. The following paper will focus on the efforts that the city of Trelew has made in the past months to contain both the spread of the virus and mitigate the dynamics of the city's economic flows, especially the already scattered and fragile economy of the popular sectors.

Most of the data presented for the current work are data gathered by past publications concerning the previous dimensions of the city's popular sectors. Nonetheless, the methodology applied for follow-up research is based on interviews with local authorities and some social organization members. This qualitative approach gives a more resourceful insight into the experiences that some of the popular sectors' population struggle around the pandemic's measurements. The purpose of the work is to understand these processes in a wholly unprecedented and highlight the achievements for a potential resilient communication between members of the underclasses and the local municipalities for improving the quality of life of all the urban citizens.

EPIDESKTOP: A GIS-based Platform for Simulating COVID-19 Spread and Human Mobility Trends in The Greater Tokyo Area, Japan

Ahmed Derdouri, Tokyo Institute of Technology
Toshihiro Osaragi, Tokyo Institute of Technology

Abstract: Human mobility has been recognized as one of the critical factors of contagious diseases spread. COVID-19 as a highly contagious and eluding virus is not an exception affecting the normal lives of more than half of the global population in a way or another and claiming the lives of hundreds of thousands. As a response to such a situation, mobility should be managed by imposing certain policies. In light of this, this proposed study presents a newly developed GIS platform aiming at simulating and mapping the spread of COVID-19 and the mobility patterns in Tokyo under different scenarios based on different epidemiological models.

In addition to the "business as usual" scenario, other response scenarios can be defined to reflect real-world situations taking into consideration various parameters including the daily rise of infected and deaths among others. The developed system might offer a useful tool for decision-makers for insights about strategies to be implemented and measures to control the spread of the virus.

Exploring Coupling Effect Between Urban Heat Island Effect and PM$_{2.5}$ Concentrations from the Perspective of Spatial Environment

Yunhao Fang, School of Architecture and Planning, Anhui Jianzhu University
Kangkang Gu, Anhui Collaborative Innovation Center for Urbanization and Construction

Abstract: With the deepening understanding of climate environment, the coupling effect between urban PM2.5 concentrations and urban heat island effect has been paid more and more attention. Previous studies mostly focused on data correlation analysis, lacking the interpretation of the formation texture. In this study, we took the main urban area of Hefei city as the research object, and combined the spatial statistical model with the coupling coordination degree model to explore the influence of spatial environment-related indicators on the coupling effect of cities. Specifically, the paper verified the spatial autocorrelation of urban heat island intensity and PM2.5 concentrations, and built the coupling coordination degree model based on this. Then, through the spatial statistical model, we explored the relationship between the coupling coordination degree and the spatial environment, including land cover, land use, building form and road traffic. Finally, at the micro level, the paper used grid unit to verify the relevance and made a comprehensive analysis on the formation texture of coupling effect. The results indicated that: (1) there is a significant coupling effect between the UHII and PM2.5 concentrations in the main urban area of Hefei with significant spatial heterogeneity. (2) the indicators of urban spatial environment, including vegetated areas, buildings, residential land, commercial land, industrial land, building density, floor area ratio, building form ratio, the densities of road junctions and sub-arterial roads, have different effects on the coupling effect to some extent. In general, the higher the degree of human activity, the higher the degree of coupling effect. (3) the coupling effect may be influenced by a variety of spatial environment factors. In addition, this study provides an important basis for the improvement of urban climate and human settlements from the perspective of the spatial environment.

Exposure to Medical Street Advertisements (MSA): Emotional and Behavioural Impacts

Min Gao, Chongqing Technology and Business University
Jianquan Cheng, Manchester Metropolitan University
Wanyi Li, Nanning Normal University
Jun Hu, Central China Normal University

Abstract: Medical Street Advertisements (MSA), a form of outdoor commercial medical marketing, are widely used in urban streets with mixed economic and social purposes. The impact of MSA on the mental health and emotional well-being of pedestrians from different demographic and socio-economic groups with varying spatio-temporal exposure to MSA has been rarely studied. Using Nanning City in Southern China as a case study, this study aims to analyse the emotional and behavioural responses of pedestrians to MSA and has shown significant disparity between pedestrians from different socio-economic groups using a mixed

methods approach. The results revealed that (a) male, elderly (adults aged $\geqslant$ 60 yrs), low income and less well-educated groups were more likely to have a negative emotional response to MSA; (b) Exposure duration and self-rated health status were important influential factors on emotional responses to MSA; (c) individuals who had a negative emotional response to MSA were more likely to adopt active avoidance behaviors. As the first study of the impact of this type of advertising landscape, these findings highlight the social and psychological influence of MSA, which has relevance to the design and governance of healthy urban environments.

What Policies Help to Prevent Covid-19 in Indonesia? A Comparative Analysis of Selected Urban Agglomerations

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Tia Insani, Department of Urban and Regional Planning, Diponegoro University
Micah Fisher, University of Hawaii
Santi Mardhotillah, Department of Urban and Regional Planning, Diponegoro University

Abstract: With higher densities, urban agglomerations are sites of the fastest rates of Covid-19 transmission. In Indonesia, one of the fastest urbanizing regions in the world, the national government issues policy recommendations, but its applications are contingent upon local government jurisdictions. Many of the policy formulations to stem the spread of the disease are conducted through policies that control people's mobility or regulate their daily activities. In this paper, we analyze the effects of policy interventions relative to confirmed cases in seven urban agglomerations. Data is collected from confirmed cases and overlaid with policy interventions of each jurisdiction, which is then analyzed for its effects over a timeline from March to Mid-October 2020. By sorting the control measures from existing policies at each jurisdiction, we make some conclusions about which policies helped to stem or served to trigger the surge of Covid-19 clusters. The analysis shows unsurprisingly that within each agglomeration, the core urban areas continue to represent the highest number of cases. This is unsurprising given the relationship of the disease and its transmission. More revealing, however, since school closing is the most strict and consistent measure to control peoples' mobility, the policy had the highest impact in slowing its spread. Nevertheless, policies should also be viewed in the context of its applications in the form of unclear conduct or loose enforcement of control measures. At this juncture, viewing the spatial distribution of the disease relative to the effects of policy interventions point to the importance of continuing to promote certain protocols.

Analysing Structural Factors Influencing the Vulnerability of Hispanic Community to COVID-19: A Case Study in Chicago

Ka Yin Ho, Illinois Institute of Technology
Hao Huang, Illinois Institute of Technology

Abstract: Since the outbreak of the COVID-19 pandemic in the United States, the Hispanics or Latino community consistently shares a higher percentage of COVID-19 patients compared with other racial and ethnic groups. When studies suggested the racial disparities and structural inequality play a big role in worsening the situation, some papers have covered the

chronic disease issue of the Hispanic community that causes a higher risk of the complication and some have discussed the Hispanics as service workers have a higher risk of exposure to the disease, leading to a high infection rate. However, there is no empirical study to aggregate all existing structural factors to explain the vulnerability of the Hispanic population to the COVID-19.

This study takes the City of Chicago area as a case study, to investigate structural factors influencing the Hispanic community vulnerability to the pandemic at the zip code level. The structural factors include coexisting medical conditions, weak healthcare protection, citizenship, and immigration status, language barriers, living and family conditions, and income level. Demographic, socioeconomic, healthcare, and family structure data were extracted from the 5-Year American Community Survey published in 2018. Results indicate frontline service sectors and family size contribute to the high concentration of COVID-19 in Hispanic neighborhoods. Therefore, it is suggested that the policymakers should target and improve the structural disparities and our results hold strong evidence to bargain for more support to the vulnerable Hispanic population.

Is COVID-19 Lockdown in Wuhan a Self-Organising Process?

Juan Hu, School of Urban Environment and Ecology, Central China Normal University

Jianquan Cheng, Department of Natural Science, Manchester Metropolitan University

Abstract: The first large-scale COVID-19 lockdown occurring in Wuhan municipality, which lasted for 76 days from 23th January to 8th April, 2020, has been proven a successful combat. This paper aims to explore the self-organising process of such combat by focusing on the dynamic and non-linear interactions between diverse organisations and their roles in the lockdown. We proposed that the whole process of combat is divided into three stages, at each of which the community and neighbourhood have demonstrated varying contributions to coordinate the top-down and bottom-up managements related to the combat activities. Particularly, neighbourhood governance, with support of WeChat networks, has played key roles in social and spatial governance. The paper argues the community and neighbourhood could be key agency in developing resilient city in response to COVID-19 like public health and other disasters. The paper has also evaluated the roles and limitations of digital infrastructure.

The Impact of Development Intensity on Its Spatial Sustainable Development: A Case Study of Ecologically Fragile Areas

Jinjing Hu, Chongqing University

Abstract: The sustainable development of space is related to people's health and well-being. How to realize the sustainable development of space is a very important issue. In the ecologically fragile mountainous areas, urban development intensity is an important factor affecting the sustainable development of space.

According to the theory of "social economy nature composite ecosystem", ecological carrying capacity is considered to reflect the carrying capacity and pressure of complex ecosystem under the conditions of rational development and utilization of resources and benign environment cycle. The sustainable development potential of regional ecosystem can be systematically evaluated from long time series.

At present, the spatial sustainable development of ecologically fragile areas is less concerned with the index of development intensity. According to the existing research, the development intensity is characterized as development intensity index, economic development intensity and spatial development intensity; meanwhile, according to the PSR model, the ecological carrying capacity is divided into three dimensions: pressure, state and response, and an index system involving ecology, economy and society is constructed for comprehensive evaluation.

In terms of methods, the coupling coordination degree model and geographical regression model are used to deconstruct the interaction relationship between them from the dimension of time and space, and the spatiotemporal correlation analysis is obtained.

Therefore, this paper takes the Chongqing section of the Three Gorges Reservoir Area as the core research area, and uses the coupling co scheduling model and geographical regression model as the research methods to explore the impact of development intensity on ecological carrying capacity in recent ten years, and its relationship, so as to quantify the impact and relationship between development intensity and spatial sustainable development in ecologically fragile areas.

Spatiotemporal Assessment of Extreme Heat Risk for High-density Cities: A Case Study of Hong Kong

Junyi Hua, The University of Hong Kong
Chao Ren, The University of Hong Kong

Abstract: High-density cities are faced with increasing extreme heat driven by climate change and local urbanization, but localized heat risk detection is still at an early stage for most cities. This study developed a spatiotemporal hazard-exposure-vulnerability assessment of the daytime and nighttime extreme heat risks in Hong Kong for 2006, 2011, and 2016 integrating cumulative extreme heat in summer, population density and a principal component analysis of demo-socioeconomic characteristics, based on the Intergovernmental Panel on Climate Change's risk concept. The locally-defined very hot day hours and hot night hours were separately mapped through land use regression modelling to reflect heat hazard. The heat risk index was classified and mapped for about 150 communities in the daytime and nighttime for each study year to detect the spatiotemporal variations. The hazard maps show an increase in the extreme hot weather conditions from 2006 to 2016 in both the daytime and nighttime. Strong intra-city variability in the nighttime heat enhanced by the urban heat island effect was observed. Combining the hazard, exposure and vulnerability, the heat risk was found spatially variant, and high-risk spots were identified at the community scale for daytime and nighttime with underlying determinants behind. In both the daytime and the nighttime, high risk mainly occurred in the core urban areas. Nearly 10 more hot-spots were found in the nighttime than those in the daytime. Several old communities in Kowloon stayed at high risk from 2006 to 2016. Some new towns in the New Territories turned to be at higher risk in 2016 compared to 2006 and 2011, and this result showed signs to be emerging hot-spots in the near future. The present study offers explicit spatial information about the hot spots of heat-related vulnerability and risk and the hidden contributors, which could serve as useful references for relevant decision-makers and stakeholders at different levels in formulating measures and strategies and future urban planning to mitigate or prevent possible negative effects of extreme heat in targeted zones or communities.

Resilient Pattern-based Alternatives for Public Transport Infrastructure

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Abstract: Public transport has been hit hard by the COVID-19 pandemic. With the public mobility spaces turning into hotspots for transmission of the disease and the consequent sharp restrictions set by the government, the masses at large are gripped by a caution. The increased dependence on private vehicles has forced formal and informal operators in the public transport sector to scale back or completely shut down less viable routes. Such denial of shared transit may have disastrous consequences for the poorer households. The effects of anthropocentric development having set in motion unmanageable climatic and biological events, we need to learn to live with pandemics, and adopt resilient alternatives for critical public infrastructure.

The paper analyses the public transport system closely, with specific focus on the Mass Road Transit System which plays a pivotal role in transportation at the grass root level. It raises issues that could be identified in bus terminal design in an envisioned post pandemic reality, that may need attention. These are then further identified and grouped into 'patterns' that offer a way of thinking about the problem and provides ideas and examples of what could be done to address them. This notion of patterns is inspired by the seminal work" A Pattern Language: Towns, Buildings, Construction" (C. Alexander, 1977). A pattern thus guides the process of solving a problem and helps develop design interventions that are locally appropriate and responsive to the situation at hand. These issues are not discrete or isolated; the intention of patterns is that they be used in combination. Thus, the appropriate combination of patterns will vary with the circumstances and thus could be flexibly adopted and applied globally.

The research intends to envision resilient alternatives to public transport infrastructure and seeks clarity on the post pandemic reality viz-a-viz speculations about the urban transformations predicted as possible climaxes of the pandemic. Further, the research analyses how the patterns thus derived perform in those speculated situations and formulate generic guidelines that aid the development of resilient and versatile solutions.

Spatial Healing: Bridging Space and Place through the Concept of Wholeness

Bin Jiang, University of Gävle

Abstract: Sustainable urban design or planning is not a LEGO-like assembly of prefabricated elements, but an embryo-like growth with persistent differentiation and adaptation towards a coherent whole. The coherent whole has a striking character – called living structure – that consists of far more small substructures than large ones. To detect the living structure, natural streets or axial lines have been previously adopted to be topologically represent an urban environment as a coherent whole. This paper develops a new approach to detecting the underlying living structure of urban environments. The approach takes an urban environment as a whole and recursively decomposes it into meaningful sub wholes at different levels of hierarchy or scale ranging from the largest to the smallest. We compared the new approach to natural street and axial line approaches and demonstrated, through four case studies, that the new approach is better and more powerful. Based on the study, we further discuss how the new approach can be used not only for understanding, but also for effectively designing or planning the living structure of an urban environment to be more living or more liveable.

An Exploratory Survey on the Perceived Risk of COVID-19 and Travelling

Peraphan Jittrapirom, Radboud University
Garavig Tanaksaranond, Chulalongkorn University

Abstract: In the face of an emerging and novel pandemic, perceptions of its danger and probability of being affected can influence how an individual take precautionary actions. We performed an exploratory study to examine how travellers perceive the risk-related to COVID-19 and how the outbreak has affected their commuting and non-commuting travel activities. Building on previous studies, we propose a working hypothesis of personal risk perception and trip adjustment decision and collect information to preliminary check our hypothesis. We report on our work, and the results of an online survey carried out between March 12-19, 2020, which collected 71 responses from countries in Europe, Asia, Australia, and the Middle East in this working paper.

Our results illustrate how the respondents altered their travel, their rationales, the precautionary actions they took, their foremost concerns, the sources of information they based their decisions on, and how useful they found teleconference as an alternative. Also, we observed their risk-related perception concerning the proposed model. We found several potential correlations and some regional and country variations but were unable to draw any definitive conclusion due to the limited sample size. We share our preliminary results here for discussion purposes.

How Did Travel Mode Choices Change According to Coronavirus Disease 2019? Lessons from Seoul, South Korea

Moon-Hyun Kim, Seoul National University
Tae-Hyoung Tommy Gim, Seoul National University

Abstract: The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic is believed to have substantially changed travel mode choices. While current urban transportation policies and plans aim at higher public transit ridership, the negative perception that transit is unsafe increases in line with the spread of Coronavirus Disease 2019 (COVID-19) because of its higher risk in cases in which so-called 3C conditions are met: crowded areas, close-contact settings, and closed places. Thus, this study empirically examines how the perception of urban spaces changed by COVID-19 and how it influenced the choice of travel modes, accordingly, in the Seoul Metropolitan Area, South Korea. A structural equation model presents positive changes in the perception of the open space and natural environment and negative changes concerning such facilities as restaurants, grocery stores, entertainment facilities, and indoor sports facilities. The negative perception is found to result in changes in travel mode choices by increasing automobile travel as an alternative to transit travel, which necessarily requires 3C conditions. In relation to the limitations of the current metropolitan transit system, the findings provide policy implications for post-COVID-19 transportation.

Ecological Network Analysis and Construction between Land and Ocean: A Case Study in the Economic Development Zone of Gulei Port, China

Tao Lin, Key Laboratory of Urban Environment and Health, Institute of Urban Environment, Chinese Academy of Sciences
Meixia Lin, Key Laboratory of Urban Environment and Health, Institute of Urban Environment, Chinese Academy of Sciences
Junmao Zhang, Key Laboratory of Urban Environment and Health, Institute of Urban Environment, Chinese Academy of Sciences

Abstract: Contemporary processes of urbanization present a major pressure on aggravating the fragmentation and isolation in ecological environment. At this point, constructing ecological network, as an effective way to connect fragmented habitat, becomes increasingly salient in maintaining biological diversity and enhancing ecological security. This study takes economic development zone of Gulei Port, China, as the study context, and develops an optimized scheme for ecological network construction with the consideration of the connectivity between the mainland and the ocean based on the source-sink landscape theory. In this study, drawing on a series of long-term (1986-2018) indicators, including terrain, landscape, vegetation cover and human activity, a Habitat Suitability and Stability Index is established to identify three types of habitats (historical/ basic/present) in the study area. With the two essential elements, namely, habitats and ecological resistance surface, the corresponding ecological corridors of historical, basic and present habitats are identified in line with the minimum cumulative resistance (MCR) model in GIS software. With the comparison and assessment of the structure of these three ecological networks, this study finally presents an optimized ecological network construction scheme between land and ocean. The results show that, 1) 26 historical habitats are remained with area of 324.47 km2; there are 325 ecological corridors with a total length of 176.51km; 2) 77 basic habitats are identified with area of 184.22 km2 which connect the 2926 ecological corridors with a total length of 896.12 km; 3) 49 present habitats are identified with area of 245.32 km2 and connect the 1176 ecological corridors with a total length of 448.37km; 4) Given the importance of ecological habitats and the connectivity and effectiveness of ecological corridors between land and ocean, 20 key ecological habitats and 5 key ecological corridors are determined, forming an ecological security pattern for Gulei Port. Our funding could provide important scientific support for constructing and optimizing ecological network in the urbanization or industrialization area in the coastal zone.

How Universities Use Personal Information to Ensure Education and Management Quality During the COVID-19 Pandemic: A Case Study of Universities in Fujian, China

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Abstract: During the period of COVID-19 pandemic, many industries and businesses have been impacted, as well as the education of universities. This research aims to elaborate how universities should use personal information to ensure education and management quality during the pandemic. Usually, universities will take two main measures to deal with different phase of COVID-19 pandemic: 1). Postpone school start date and conduct online education

when the pandemic is severe; 2). Increase efficiency in campus management and start offline education when the pandemic is slow down. For these two different education methods, the usage of personal information is different. Taking universities in Fujian Province as an example, we collected and analyzed the notices and policies from the Academic Affairs Office of Fuzhou University. Besides, we interviewed teachers and students to obtain online course information of the School of Architecture and Urban-rural Planning of Fuzhou University. We found that in current online education, the collection and use of personal information by universities or online education platforms is insufficient, which affects the quality of teaching; Nevertheless, if the amount of collection and use increases, it will face privacy protection issues. While in current offline education, measures taken to prevent and control the pandemic require large amount of personal information, such as personal travel information, travel purpose, health information, etc. As it involves personal privacy, it is necessary to improve the protection of these personal information in both online and offline education. Furthermore, the more effective application of personal information in online education, and the combination of online and offline education, will greatly help improve the quality of education.

Keywords: Personal information protection, Quality of education, Online education, Campus management, COVID-19 pandemic.

How to Integrate Urban Health into Planning Urban Public Amenities in Innovation Districts: Case Study of the Optical Valley, Wuhan, China

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Abstract: Health has been considered as the pulse of the New Urban Agenda, while innovation districts have been acknowledged as the driving force of new economies. The health issues of innovation districts should be paid more attention to not only because both their irreplaceable roles in urban developments, but also because the residents of innovation districts i.e. knowledge workers tend to have sub-health conditions more easily, which could be turned around by improving urban amenities. The provision of urban public amenities, which include health and welfare services as well as sports and culture facilities, is closely related to the health of all knowledge workers. While more access to health and welfare services is essential for maintaining good health and ensuring health equity, sports and culture facilities could help improving sub-health conditions or mental health. Although studies have been conducted on the linkages between urban health and built environments, few focus on the planning of urban public amenities in innovation districts towards urban health. This paper focuses on how to integrate urban health into planning urban public amenities in innovation districts by the case study of the Optical Valley, namely the East Lake Independent Innovation Zone in Wuhan, China. By literature reviews and investigation of knowledge workers, the paper establishes a framework of providing urban public amenities in innovation districts in terms of planning indexes, systems and layouts. First, the standard of planning indexes for urban public amenities has all been customized to the age distribution and specific requirements of knowledge workers. Then, the system of urban public amenities is suggested to be simplified only including urban and community levels, adjusting to the life style of knowledge workers. Last but not least, the strategies of locating public amenities, commercial amenities and pocket parks together have been proposed, adapting to the behavior patterns of knowledge workers. This framework could be used as references in planning and policy making of urban public amenities in innovation districts.

The Mega Events During Covid-19 Pandemic: The Case Study of European Capital of Culture, Eleusis 2021

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Abstract: Since the beginning of the Covid-19 pandemic crisis, most scientists have been trying to figure out the sectors that would be affected but also ways to avoid or recover from the negative effect.

After almost a year of the new "pandemic" type of life, it has been realized that one of the main problems which triggers the Covid-19 infection, is the people's gatherings and translocations especially when the measures are not properly invoked.

As far the organization of the European Capital of Culture, Eleusis 2021, faced many difficulties in executing the program as designed, during the last ten months. Almost everything had to be redesigned in order to follow the guidelines of the World Health Organization as summarized in "Key planning recommendations for mass gatherings in the context of Covid-19". Events had to be cancelled. People had to stay in distance instead of coming together. Eventually, the year of the title changed, in order to redesign and reorganize properly this important cultural mega-event.

There is a need to come up with new, fresh ideas in order not only to recover from the interruption, but also to successfully execute the event. Covid-19 may have presented as a threat in our everyday lives or business, but it should be seen as a perfect transformative opportunity to be innovative.

The objective of this paper is to investigate the type of the resilient solutions, combined with governance aid and other stakeholders' private investments that will be initiated and the actions for the realization of the current mega event. The urban planning of the city will focus on more open green areas by keeping also the social distances. Therefore, less buildings, more open stages should be needed. Tourism needs to be more specific and focused. Less people in more points of interest will be planned, depending on certain criteria as well as alternative types of transportation. Moreover, as sequence, the digital world will be the new reality. Everything should be approachable both physically and digitally.

Therefore, Covid-19 was the reason to stop, rethink, redesign, restart.

COVID-19 and Resilient Cities - Case of Abu Dhabi

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Abstract: A resilient city is a city that can combat and survive natural hazards, economic, health, or/and social type of pressure because it has endured them, or because it considered them in planning of future strategies and action plans for preparation and protection.

One of the challenges that a city may face is weak risk management and limited infrastructure and resources. In addition to unpreparedness of spaces to accommodate enough number of victims and patients. With COVID-19, no country and no city in the world was prepared for such a risk, a risk of spreading an uncontrollable disease.

This research explores some examples of cities which had been hit with high number of victims and patients and were not prepared with enough and appropriate infrastructure and spaces especially for medical care, for example Spain. Unlike other cities and countries for example UAE that had the chance to be hit afterwards and have had enough time to think, observe, and learn from other experiences to act, face, and combat COVID-19.

Furthermore, the paper covers two different scales, architectural and urban ones. It aims firstly to study how can large halls and spaces be transformed to spaces with high medical standards and hygiene levels to accommodate medical use to combat such a risk. The example of Japan and Kuwait among others will be mentioned as countries which turned conference and gymnasium halls to shelters and movable hospitals, in addition to the New York case where tents outside the hospitals were settled to accommodate more patients to extend the medical care.

Secondly, it proposes a master plan in a sample neighbourhood in Abu Dhabi, the capital city of UAE, that shows the distribution and the location of some large spaces and potential buildings, which have been selected by the authors according to some criteria for example, accessibility, proximity, capacity, radius of services, flexibility of plans/layout, some technical criteria, etc. These buildings can possibly be transformed and converted to a medical use in case of risks and crisis in the future. By such measures, the city of Abu Dhabi would be more prepared spatially to such risks and act rapidly and efficiently to be more resilient.

Correlates with the Choice of Urban Spaces in the COVID-19 Era

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Abstract: The spread of infectious diseases such as Coronavirus disease 2019 (COVID-19) is a spatial process. Cluster infections of COVID-19 have occurred in various urban spaces worldwide, which require a spatial approach to understand the dynamics of infectious disease. In this study, we conduct an online survey in the Seoul metropolitan area of South Korea in order to investigate changes in the use of urban spaces and examine factors that affect the choice of urban spaces in the COVID-19 era. We categorize various urban spaces by three activity types derived through previous studies: space for mandatory activity, maintenance activity, and discretionary activity. The result shows that all three types of urban spaces are visited less than before the COVID-19 pandemic. Factors that influence the use of all types of urban spaces is a preference for face-to-face consumption and risk perception of COVID-19. Gender is a factor that only affects the use of space for mandatory activity. Compliance with social distancing, refraining from outdoor activities, and perceived safety of the city towards COVID-19 are shown to affect the use of space for both maintenance and discretionary activity. Meanwhile, a marital status only influences the choice of space for maintenance activity, and age has an influence on the choice of space for discretionary activity. We reveal that changes in the use of urban spaces and factors that affect the choice of urban spaces differ by the type of space during the COVID-19 crisis.

Shopping Behaviour and Awareness during COVID-19-related Panic Buying - A Case Study Conducted in Three Japanese cities

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Abstract: In the situation of the COVID-19 pandemic, a panic buying of TP was happened among many cities in Japan by news and rumors that toilet papers (TP) would become out of stock in stores.

This study aims to obtain the useful suggestions to prevent the panic buying and un expected problems, by understanding the characteristics of individuals actual shopping behavior and consciousness.

An online questionnaire survey was conducted in April 2020, in Morioka city, Kanazawa city and Toshima ward. Then, to achieve the study aim, we conducted mainly two parts of analysis; 1) the spatio-temporal concentration of individuals' shopping behaviors and 2) the result of their shopping for TP. All analyses were based on quantitative approach, and conducted with appropriate statistical methods.

Firstly, we could confirm that the temporal concentration of individuals' shopping within short period caused the panic buying in several regions of Japan. As characteristics of respondents who went buying, the result suggested that people who had characteristics that tend to lead to a sense of anxiety and difficulty against this panic buying situation tended to go shopping for TP.

Secondly, when focusing on the spatial concentration of people's buying, respondents mainly went to drag stores and supermarkets. It was common tendency to all three regions. As their moving range, most of them chose the stores located within 10 minutes from their residence. Furthermore, proximately 40% of respondents selected the different store compared with usual situation. However, the result also suggested that people's store choice behaviours in panic buying situation were within the extension of daily purchasing behaviours.

Finally, as a result of shopping for TP under different circumstances from usual situation, it caused many people's inconvenience. People who had specific characteristics tended to fail obtain enough TP. Furthermore, the results also showed that failing to obtain sufficient TP become one of main factors of the inconvenience. The results also indicated that specific individual attribute and behaviour (female shoppers, visiting many stores) and regional character (living in Toshima ward) affected the occurrence of inconvenience.

The results of his study would give useful suggestion to prevent occurring the problems between customer or customer and stores under the panic buying situation.

What Have We Learned from COVID-19? A Theoretical Discussion toward Sustainable Spatial Planning for Human Wellbeing in Dealing with Wicked Pandemic

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Abstract: Since April 2020, the Coronavirus, COVID-19, as a global pandemic, has caused such a major health crisis that has forced governments in all over the world to search for policies which lead them to extreme minimization of social contact to mitigate the spread of this pandemic. Unfortunately, the implementation of such social isolation turned COVID-19 from a global health crisis into a multitude of unexpected complex crises such as national economic crisis, mental health, domestic abuse, etc. (Klasche, 2020) which allow us to classify it as a 'wicked problem' (Rittel and Webber, 1973). In this paper by narrowing our attention on

some of specific characteristics of COVID-19 as a complex wicked problem and by relying on Rational theory and using Collaborative Planning Theory, aim to answer our research question: How can we deal with the wicked COVID-19 by using Rational Planning and Collaboration Planning theories?

The Comprehensive Rational planning model is a model that emphasis on the processes of understanding a problem followed by establishing and evaluating planning criteria, formulation of alternatives and implementing them and finally monitoring the progress of the chosen alternatives (Taylor, 1998). Collaborative planning, on the other hand, is suitably interpreted as an element in a longer-term programme of research and theoretical development with focus upon a concern with the democratic management and control of urban and regional environments and the design of less oppressive planning mechanisms. Regardless of the differences between Rational Planning and Collaborative Planning Theory, they have both one in common. None of them can guarantee emotional and physical wellbeing alone. Rational Planning Theory has some limitations that proved planning for a large social system to be impossible without loss of liberty and equality" (Rittel and Webber, 1973). In addition, the cost-benefit approach of Rational Planning that tends to put off the future and demand a shorter-term policy ignores the physical health of the population in encountering a pandemic crisis. On the other hand, the subjective nature of participation practice in Collaboration theory that is based on a moral commitment to social justice can create conflicts at both the national and global levels and hinder establishing central global authority which is necessary to manage the spreading of pandemic. On the other side, the democratic approach of collaborative planning addresses the most vulnerable who suffer the most physically and financially due to limited economic resources, medical facilities, and supplications scientific knowledge of COVID. Add to all these, time-consuming scientific aspects of Rational planning in tackling this pandemic, producing vaccines. However, social distances that aimed to buy more time have already caused much domestic violence, fear of social contact, anxiety, depression, loneliness, fear of going to the medical centre, and much more. For this reason, its effectiveness remains questionable especially when we do not know what the next pandemic would be, and when it is going to show up again.

In this paper, through combining top-down and bottom-up governance, we present some key principles that can contribute to accessible, affordable and safe opportunity for physical activities, social contacts, practicing self-esteem and increasing the sense of responsibility towards others. Further, we discuss how these keys and policies that promote these keys eventually contribute to social, emotional, and physical well-being.

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Changes in the Perception and Behaviour of Urban Green Spaces after COVID 19 by the Types of Greenery in South Korea

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Abstract: This study aims to find out how the social change caused by COVID 19 influenced urban residents' perceptions and behaviours of urban green space. In Korea, there was an epidemic in Daegu city in February and in the Seoul metropolitan area in August. Immediately after those epidemics, due to proper government management and compliance with living in quarantine by the people, Korea has been able to manage with a small number of confirmed cases compared to those of other countries. Besides, there have been some regulations on social distancing in daily life for protection. Still, fortunately, there was no compulsory total lockdown on people's daily outdoor activities. So even after COVID19, Korean people could access outdoor recreations and urban green areas continuously.

Urban green space is an infrastructure for maintaining a comfortable life with nature in a city. Many experts say that some of the social changes caused by the COVID 19 pandemic will remain in our society under the name of 'new normals'. Therefore, it is a critical task in urban planning to study the changing demands and functions of urban green space in the coming era of the 'new normal'.

This study analysed the people's behaviours in urban green spaces after the COVID 19 outbreak, using Naver blog posts, the most popular social blog mainly used by Korean people, as data.

The research question is: First, how has daily life related to outdoor activities changed due to the COVID 19? For this, we analysed how outdoor nature spaces have been importantly perceived, using 'COVID 19' and 'everyday life' as search keywords. Second, we investigated how each of greenery types in the city, such as nature parks, city parks, forests and other neighbouring green areas were perceived and utilised respectively in the COVID 19 pandemic era. Lastly, in Korea, there was a considerable difference in the number of coronavirus cases in cities. Most of the outbreaks were in two cities, Seoul and Daegu. The study compared whether there was any difference in perceptions and behaviours about each of greenery type in seven major cities, including Seoul and Daegu. The study mapped using the centrality degree values using some keywords showing differences by city.

As a result, the social distancing regulation in daily life applied during the COVID 19 pandemic reduced the physical activities in everyday life. Therefore, the time for indoor activities increased and the time for outdoor activities decreased. This has caused the demand for people to engage with nature to exercise and walk to grow more and more. Also, in the behaviour patterns in urban green spaces, events and group activities decreased and daily routine outdoor activities by individuals increased. Recreational facilities, swimming pools, plazas, X game fields and other outdoor gym facilities, where a large number of people gather, were often temporarily restricted to use depending on the level of social distancing regulation. The overall number of users also decreased. However, the number of users of woodlands and forest trails in parks increased.

In addition, city parks having a large area and many facilities had fewer visitors, and the use of neighbouring green areas where they could be accessed by foot increased. We could understand the main purpose of visiting neighbouring green spaces or urban forest trails was exercise or walking. Lastly, comparing by cities, where the number of cases of COVID 19 was high we observed a considerable increase of visitors to forest trails and neighbouring natural spaces.

Korea has high-density development and especially very concentrated land use in cities. Urban greenery in a large city is an important asset that provides various services through the natural environment to urban residents. When a city is planning a new city park, it aims to maximise the possible catchment area of potential users.

The most significant change since COVID 19 is the increase in demand by people for nature in their daily life with equality for rich and poor, young and adult. Also, the city needs to consider how to reduce the user density of urban green spaces in order to maintain social distance depending on the situation. For this, in green areas such as urban parks, it is important to provide high naturalness such as forests, rivers and grasslands to people. Secondly, large-scale urban parks with well-equipped park facilities are important but more green spaces encountered within the neighbouring area are also needed. The necessity for these has been mentioned in the early planning stages but was frequently overlooked in the actual plan.

The social blog data used in this study has strengths in that it is cost-effective and accessible to acquire data on people's perceptions and activities in a wide area and to be able to compare between cities. On the other hand, the blog post data could exaggerate or underestimate the reality on the ground and suffer from the biased opinions of specific age or user groups. A sufficient understanding of the data is required. Also, it is necessary to understand the facts in depth by comparing the results of this study with other approached studies such as field-based surveys and interviews in the future.

Automatic Generation of Double Leaned Roof Model for Smart Houses

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Abstract: To achieve SDGs (Sustainable Development Goals), more smart houses will be built to reduce the energy needed for heating and cooling while maintaining comfortable living conditions. Smart houses are designed to be energy efficient, taking into account local weather conditions and sun direction by "passive design". We automatically generate double leaned roof house models, in which the size, position and slope of leaned roofs and windows are decided by the parameter given to the function, generating the designated models. A set of parameters is customized so that the leaned roofs and south-facing windows are formed and positioned to maximize or minimize natural light and ventilation depending on the seasons, being optimized for heating and cooling. This will keep the house naturally cool in the summer and warm in the winter.

To facilitate public involvement for sustainable development, 3D models simulating a smart city by a 3D CG can be of great use. 3D city models play important role in environmentally friendly urban planning in which clean solar and wind generation will be fully used for net-zero carbon emission or low-emission goal. However, enormous time and labour has to be consumed to create these 3D models, using 3D modelling software such as 3ds Max or SketchUp.

In order to automate laborious steps, we proposed a GIS (Geographic Information System) and CG integrated system that automatically generates 3D building models, based on building polygons or building footprints on digital maps, which show most building polygons' edges meet at right angles (orthogonal polygon). A complicated orthogonal polygon can be partitioned into a set of rectangles. The proposed integrated system partitions orthogonal building polygons into a set of rectangles and places rectangular roofs and box-shaped building bodies on these rectangles.

In this paper, for designing energy efficient smart houses, we clarify the structure of double leaned roof that is made up of two leaned roof boards and south-facing windows. The sizes, positions and slopes of roof boards and under roof constructions are made clear by designing the top view and side view of a double leaned roof house. For the application example of our

developed system, we simulate the incoming sun light radiation to a double leaned roof house. Our simulation reveals that the optimized double leaned roof models can be found by "passive design", i.e., varying and examining parameter associated with the sizes, positions and slopes of roof boards to maximize or minimize natural light and ventilation depending on the seasons.

How COVID-19 and Campus Lockdown Policies Contribute to the Inequality of Green Space Accessibility? Evidence from University Campuses in Wuhan

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Abstract: Urban green infrastructure has important roles from climate change adaptation to health and well-being by providing ecosystem services, and uneven distribution would lead to social and spatial inequalities. The COVID-19 has reshaped urban life, and significantly different urban enclaves adopted various border policies in Chinese cities when the situation is mitigating. It still needs to investigate the pandemic and lockdown policies within the built-up area. Taking Wuhan as the case, connecting urban green infrastructure and urban enclaves and considering university campuses as a kind of multi-functional urban green infrastructure, this study explores COVID-19 and campus border lockdown policies' impact on access inequality to green space at the local scale. Green space accessibility and crowdedness and their differences before and after the pandemic were estimated by two-step floating catchment area (2SFCA) and inversed 2SFCA (i2SFCA) based on demands and supplies, and we used Lorenz Curve and Gini Coefficient to measure such inequalities. The results indicate that green space inequalities existed before the pandemic, and such campus lockdown policies further and heterogeneous contribute to the disparity of green space accessibility and crowdedness.

Measuring the Fear of Crime to support Healthy Street Environmental Design

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Abstract: Whilst generally recognised as a critical component of urban planning and design, environmental design to achieve healthy streets in terms of people's emotional well-being is frequently overlooked in planning academia and practice. One motivation for this study is the insufficient attention paid to understanding context-specific and time-specific judgments people make and their emotive responses with regard to the fear of crime they may experience in an urban street. Previous studies have employed traditional methods such as surveys or interviews where the questions do not measure the real-time emotive responses to crime, but rather a lagged estimate of perceived risk based on respondents' recall. To quantify healthy streets, this study is focused on analysing the impact the impact of environmental design upon the fear of crime, by using new forms of data and innovative methods. Previous studies have shown that fear of crime, provoked by physical and social features of the streetscape, has a direct impact upon pedestrian navigation through an urban environment. This study addresses the uncertainty with regard to meaning and measurement of the fear of crime, using a mixed method approach of Virtual Reality (VR) and Geographical Information Science(GIS) that is capable of fine grained spatial and temporal assessment.

To address the conceptual and methodological shortcomings in previous literature, this paper will present a pilot study of measuring the fear of crime using 360 degrees videos and invited participants. The process of sampling and the GIS analysis behind it will be explained and justified. People's emotional responses pertaining to fear of crime will be collected using a

series of 360 degrees videos of urban streets in Manchester in day time and after dark. These videos are of different street segments based on their physical and visual qualities: residential, commercial, high occupancy, low occupancy, and actual crime locations and rates. Participants are requested to experience a walk-through using VR headset, pulse monitor and eye-tracker through which their responses to each street segment will be recorded. These subjective evaluations will then be analysed against objective evaluations derived from skeletal streetscape measures for each street segment using GIS. The paper, as an ongoing project, will particularly evaluate the methodological challenges being faced and potential solutions through analysing preliminary results from a pilot study.

Rural Tourism Destination Spatial Interventions Face the Risk of COVID-19 Infection. Case Study: Kampong Boenga Grangsil Tourism Destination, Dampit District, Malang Regency

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Abstract: The tourism development sector in Indonesia is currently experiencing rapid growth. During the COVID-19 Pandemic, it was the sector most affected economically. The COVID1-9 epidemic has changed "normal" conditions in all aspects of life, including tourism sector activities. The Kampoeng Boenga Grangsil Development Program faces significant spatial resilience challenges during the transition to the COVID-19 Pandemic. The uncertainty over the end of the COVID-19 Pandemic demands that we adapt to the New Conditions, New Requirements (social and physical distance), the New Order (physical, social, and health), by preparing tourist destination protocols. Some of the fundamental questions include: (1) what are the spatial implications for social and physical distance needs in agricultural tourism activities? (2) What precautions should take through spatial intervention in the arrangement of rural tourist destinations? And; (3) How is the spatial order of Tourist Destinations that can reduce the risk of contracting COVID-19 for visitors. The discussion aims to create a Spatial Intervention model for Rural Tourism Destinations in Facing the Risk of COVID-19 Infection. This study enriches the spatial design requirements for tourist destinations based on the risk of COVID-19 infection.

Research on Spatial Form of Coastal Zone in the Intersection Area of River and Ocean

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Abstract: The coastal zone is relatively narrow, with limited space, resources and self-regulation capacity, but it is an important space for human development. The activities, management and planning of the land space in coastal zones have an important impact on the production, living and ecological environment of the entire coastal zone, and as the ecological composition and human activities of its land system are more complex and fragile, the coordinated economic and ecological development will be an important issue for the sustainable development of the coastal zone while pursuing economic benefits. The coastal zone in the intersection area of river and ocean is mostly urban and densely populated, so

reasonable spatial distribution is particularly important. During the periods of public health events such as COVID-19, more attention has been paid to the spatial planning for these areas with dense population and frequent economic activity. Taking Qidong where the Yangtze River meets the Yellow Sea as the empirical object, this research identifies the layout mode of Port industry, service industry and hinterland industry, and combines the new development demands and industrial transfer characteristics to put forward the optimization strategy of industrial layout. Then it proposes to integrate the development in the form of functional groups and form multi-functional groups of ecotourism, leisure vacation and business culture to optimize the spatial form of coastal areas, carry out integrated planning of protection, development and restoration, and improve the ecological resilience of coastal zones in response to public health events.

Discussing the Role of Major Central Towns in Constructing Urban-rural Resilience Network

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Sheng Wei, Jiangsu Institute of Urban Planning and Design

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Abstract: The COVID-19 that began at the end of 2019 has tested the immunization and treatment capacity of our country's urban and rural space. Judging from the current situation, in response to emergencies, cities are superior to rural areas in terms of functions, facilities, security and governance capabilities, and rural areas naturally have the superiorities of food security and scattered housing. Therefore, taking this epidemic as an opportunity and using Major Central Towns as links, we will coordinate the construction of an urban-rural resilience network, and improve urban and rural emergency management capabilities. The article fixes up the issues why Major Central Towns are selected as the links for building the urban-rural resilience network, how to dynamically select Major Central Towns, and how to strengthen the resilient construction of Major Central Towns after selection. Based on the classical geography theories, this article conducts quantitative and qualitative analysis by urban and rural economic and social data, spatial point locations, traffic accessibility, POI, and mobile phone signalling data, comprehensively determines the results of the adjustment and selection of Major Central Towns in Jiangsu at this stage, and proposes that Major Central Towns need to strengthen four aspects of resilience construction: Strengthen life resilience by consummating infrastructure and public facilities; Increase production resilience by developing characteristic industries to promote local urbanization; Ensure ecology resilience by sticking to the ecological bottom line; Optimize governance resilience by improve basic level governance capabilities.

Modelling and Analysing 3D Urban Colourscapes to support Environmental Design

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Abstract: Similar to soundscape, lightscape and smellscape, colourscape, as an important system to express the colour theme in a landscape context, not only plays an important role in environmental recognition but also influences the emotional well-being of urban residents. The primary aim of this study is to support the environmental design by developing a novel

methodological approach for quantifying 3D colourscape through using 3D modelling and spatial analysis. To achieve this goal, three research questions should be addressed:

What are the impacts of urban colourscape on public emotional well-being?

How urban colourscape can be quantified?

How these quantitative methods can be used to support environmental design in colourscape?

This paper will propose a conceptual framework on understanding the system of colourscape by considering the spatial and space relationships between colour and buildings in complex geographical contexts, based on extensive literature review. Then the paper will justify the potential 3D modelling and analytical methods to be used for this project. Some preliminary analysis results will be presented for discussion.

The Moderate Effects of Food Environment and Obesity on COVID-19

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Abstract: The outbreak of COVID-19 has raised challenges for the people who already have health problems. And obesity is a global issue associated with COVID-19. CDC finds that obesity worsens outcomes from COVID-19. As BMI increases, the risk of death from COVID-19 increases. Also, the pandemic has transformed our built environment because of different restriction policies, it is important to develop an antivirus-enabled paradigm to reduce the spreading rate of the COVID-19 in neighbourhoods with obesity concerns and design a healthy and sustainable built environment. It is found that both COVID-19 and obesity are associated with the built environment, but few studies examine the moderate effects of the built environment and obesity on COVID-19.

According to the Chicago Department of Public Health, Chicago has about 100,000 COVID-19 cases and about 30% of the Chicago adult population is overweight or obese. This study uses spatial statistics and regression models to examine the moderate effects of the built environment and obesity on COVID-19 in Chicago. The built environmental factors to be considered include the food environment, green spaces, transportation access, and building types. The results find COVID-19 is highly concentrated in areas with low food access. Also, the moderate effects of the food environment and obesity on COVID-19 are shown in the results.

Exploration of Healthy Community Governance in China: A Case Study of Epidemic Prevention for COVID-19

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Abstract: The rapid spread of COVID-19 reveals the inadequate crisis response capability and autonomy of Chinese neighbourhood, indicating the importance of healthy community governance. It is urgent to examine the disadvantages of community governance from the lens of public health, based on which providing knowledge and theoretical foundation for implementing healthy community governance. From the public health perspective, this study first makes a reflection on the issues of community governance and constructs an analytical framework of healthy community governance. Secondly, based on the investigation on the neighbourhood W in Foshan city, this study explores the current characteristics, issues and

challenges of community governance under the epidemic prevention, putting forwards suggestions on the normalization of healthy community governance in China.

Geographic Ecological Momentary Assessment (GEMA) of Environmental Noise Annoyance: The Influence of Activity Context and the Daily Acoustic Environment

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Abstract: Background: Noise annoyance is considered to be the most widespread and recognized health effect of environmental noise. The previous researches are most based on the static study of residential environmental noise, but few have focused on the effects of noise exposure in different activity context on real-time annoyance. The two deficiencies are that it neglects the influence of activity context besides residence and fail to reflect the difference of time-scale effect of noise influence.

Methods: Using portable noise and air sensor, GPS-equipped mobile phones, questionnaire survey, and geographic ecological momentary assessment (GEMA), this paper measured the environmental noise and real-time noise annoyance of participates at different activity places. Hierarchical logistic regression models were used to examine the effects of environmental noise on people's real-time annoyance. And this paper further considered the influence of geographic context of the activity place and long-term acoustic environment on participants' real-time annoyance. Furthermore, a nonlinear regression model was constructed by random forest to further examine the nonlinear relationship between environmental noise and real-time annoyance.

Results: The results showed that: (1) the average cumulative equivalent sound level during was 55 dB(A) when the participants responded to the EMA surveys; (2) The geographic contexts of the activity places had influence on the real-time noise annoyance (e.g., the higher the temperature, the more likely the participants felt annoyed); (3) Participants with higher perception of noise pollution in residential communities were more likely to be annoyed. However, participants with higher long-term exposure to noise were less likely to feel annoyed; (4) The threshold value of the effect of noise on real-time annoyance was 58 dB(A) to 78 dB(A).

Conclusions: These findings can guide the development of urban planning and environmental noise standards and also provide a reference for noise barrier requirements for different activity places.

Research on the Construction Strategy of Fitness Space in Historical and Cultural Blocks from the Perspective of Space Syntax

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Abstract: In order to promote the construction of a healthy China and improve people's health level, China has determined a new direction of urban construction with the value orientation of national health. Historical and cultural district is an important material space voucher for human activities. However, due to its weak infrastructure and incomplete supporting facilities, it is difficult to meet the Aboriginal people's pursuit of healthy and quality life. In this paper,

through the space syntax of the existing fitness space node frequency, accessibility, integrity of quantitative analysis, to Ciqikou historical and Cultural District Aboriginal fitness space demand as a starting point, put forward block fitness space construction strategy, in order to provide a reference for the healthy development of historical and cultural blocks.

Sponsor (Supporting Organisation)

Key Laboratory of Environment Change and Resources Use in Beibu Gulf (Ministry of Education), Nanning Normal University

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