

Editorial

Transactions in Urban Data, Science,
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The five editors of *Transactions in Urban Data, Science, and Technology* are excited to welcome you to this new journal. This journal is an interdisciplinary, international, peer-reviewed journal for the publication of original research on long-standing and emerging urban issues. In this editorial, we'd like to articulate the aims, context, and scope of the journal. With this editorial, we would also like to welcome responses to our call for special issues and submissions that would propel this exciting new venture, which accepts eight types of articles.

In recent years, the Fourth Industrial Revolution, which relies on the convergence of computers and communications, is now transforming our cities with a range of disruptive technologies such as artificial intelligence, big data, and the mobile Internet. Then the new science of cities and the science of new cities are emerging and co-evolving. On the one hand, technologies generate new data and develop new methods and paradigms for urban research, facilitating us to explore the new science of cities, as Michael Batty puts it. However, the development of new science is in its infancy, and we still lack a consensus on the laws of urban system operation and what makes a good city. In recent years, big data or artificial intelligence technologies have achieved huge progress in a short period of time, expanding the scope, scale, and content of urban research, and bringing us new knowledge. Other emerging technologies such as cloud storage, 5G mobile Internet, Internet of Things (IoTs), digital twins, and intelligent construction also enable us to dig deeper into the phenomena and issues in cities. For researchers, cities are more like laboratories.

On the other hand, technological progress has affected the growth patterns, human behaviors, and construction technologies, and the city itself has undergone dramatic changes. It is urgent to explore the science of new cities. Online shopping, telecommuting, smart homes, autonomous driving, and other new changes are gradually permeating the daily lives of citizens, and new cities driven by technology are constantly evolving. The way in which a new city manifests itself is a dynamic issue to be tracked. Interestingly, new cities are likely to have different laws than the old ones, so it remains to be seen whether and to what extent the classic urban theory can be applied to new cities. It is in such a dynamic context that *Transactions in Urban Data, Science, and Technology* is being launched.

Against the above backdrop, we summarize three paths that the Fourth Industrial Revolution promotes urban development, aiming to promote urban studies to adapt to the new era.

The first path is the city laboratory. It is a method-level path consisting of two perspectives. For one thing, a new data environment composed of open and big data provides urban researchers with a foundation for urban cognition; for another thing, based on new technical tools, urban researchers can collect data based on natural environments and conduct immediate and unremitting observations and studies on cities. The subject of urban studies has been slow to develop in the past, but in recent years, with the gradual development of new data, methods, technologies, and research initiatives, the new science of cities has emerged. The emergence of diverse, massive, and rapidly updated urban data offers broad research prospects for understanding human behaviors at fine spatial and temporal scales, providing us with opportunities to study the interaction between urban space and human behavior. In particular, those high-frequency and time-varying urban data, such as mobile phone signaling data, and location-based service (LBS) data, provide new lenses into urban

operations. Under the framework of the new science of cities, new concepts and perspectives in urban studies are emerging, and the spatial and temporal dimensions of urban studies have expanded more than ever before. Urban research outcomes based on data support and quantitative analysis have provided unprecedented opportunities to verify, update, and complement traditional urban theories, and to create and refine the science of new cities.

The second path is the new city. We use the term “new city” to describe cities that are profoundly influenced by modern and emerging technologies. These impacts on urban life and urban space will gradually change and renew researchers’ perceptions of cities, thereby contributing to the renewal of urban theories. On the one hand, residents’ daily lives have been nested within various digital networks. With the increasing penetration of the Internet, especially the mobile Internet, individuals’ perceptions, experiences, and emotions are digitized, their behaviors are transformed from offline to online and offline integration, and their activities are fragmented in time, diversified, and liberalized in activity modes and locations. For example, the form of offices is more flexible and diverse, including remote offices, home offices, joint offices, and mobile offices, to name a few. The types of online services are also more abundant, such as online shopping, education, entertainment, and take-out service. On the other hand, while urban space typically changes more slowly than urban lifestyle, it will also be subtly influenced by the technological revolution. For example, there is a growing trend toward spatial mixing and fragmentation, such as shared offices and living, due to increased flexibility in the use of space. In addition, technologies such as autonomous vehicles and smart manufacturing that directly affect the scale, organization, and construction law of cities are bound to affect urban space. For example, studies have found that the popularity of autonomous vehicles can significantly reduce overall parking costs and space.

The third path is the future city. This path is for technologies to promote future-oriented planning and design in a practical way. In this path, emerging technologies are applied to planning and design practices as new elements and processes, thereby creating a smart city’s spatial form that meets contemporary needs. As the impact of ICTs on cities proliferates, urban design has also begun to embrace these emerging technologies to enhance spatial perception, feedback, and interaction. Emerging technologies can not only enable the social-level place-making through virtual forms to facilitate the interaction between people and space, but can also be implanted into physical spaces in physical form to enhance the perception of space and human behavior and promote self-feedback space management. In this process, various information about people and space is exchanged through the IoTs in digital twins to monitor the digital operation and management of cities. The planning and design at the physical level and the place-making and public participation at the social level will be integrated with interactive facilities and management platforms at the digital level. In this process, multiple parties will participate in the design, construction, operation, and renewal of future cities. For example, planners provide innovative thinking and specific planning and design solutions to guide the implementation and construction of the design scheme; community managers guide public participation, create a community atmosphere, and provide a platform for multi-agent consultation and discussion; and technology providers can provide interactive facilities and supportive technologies throughout the design and implementation process. Based on the above path, a future-oriented smart city includes not only the digital twin of the real world, but also the interaction and enhancement of the virtual world and real world.

All of the above three pathways can be observed in Chinese cities, where the level of scientific and technological development is on the rise. China is still a developing country in the transitional process of urbanization, and the Fourth Industrial Revolution will be a major opportunity for China’s national development. As a result, the Chinese government has spared no effort to promote new technologies. China’s Internet giants are gradually emerging, and the construction of smart cities is in full force. Meanwhile, the rise of science and technology has brought new challenges to urban studies.

We hope that the journal *Transactions in Urban Data, Science, and Technology* can quickly contribute scientific value to both the scholarship and practice concerning Chinese cities in the Fourth Industrial Revolution. Until now, there has been a lack of peer-reviewed journals on the new science of cities and the

science of new cities, in contrast to the widespread concern about the profound and enormous impact of new technologies on urban science. *Transactions in Urban Data, Science, and Technology* seeks to publish cutting-edge urban research on new technologies and their impact on cities. It features a flexible and interdisciplinary platform to introduce Chinese cities and Chinese urban studies, for the exchange of ideas and information among researchers, urban planners, policymakers, engineers in technology companies, and readers from different disciplines.

Transactions in Urban Data, Science, and Technology is open to a wide range of topics. The journal focuses on, but is not limited to, the following topics: smart city/infrastructure and future city driven by disruptive technologies, urban modeling, planning/design support system, big data and related emerging technologies, artificial intelligence, internet of things, wearable devices, applications in urban studies and planning, as well as imperative analytics of new cities shaped by disruptive technologies. Research ranging from architectural to international scale is all welcomed. *Transactions in Urban Data, Science, and Technology* is committed to topical, theoretical, and methodological diversity. It welcomes contributions from a wide range of disciplines including computer science, anthropology, environmental studies, economics, geography, political science, and sociology. The journal also seeks to enrich existing and emerging interdisciplinary fields. We expect the journal contributes to the understanding of non-China urbanization. More, comparative submissions are also welcomed in order to better understand Chinese cities.

Transactions in Urban Data, Science, and Technology aims to provide an unlimited academic discussion platform, so we accept a wide variety of articles to publish. Please do not hesitate to submit your articles in the following types:

- Research article: Advances existing knowledge and debates significantly through theoretical elaboration or empirical analysis. May contain up to 8,000 words (text only, excluding references, tables, and figures, but including table/figure titles and legends) in addition to a title (max. 30 words) and an abstract (max. 200 words). Links to the datasets are encouraged to be submitted together with the article.
- Review article: Summarizes existing knowledge, identifies key insights, and controversies and outlines directions for future research and/or practice. May contain up to 10,000 words (text only, excluding references) in addition to a title (max. 30 words) and an abstract (max. 200 words).
- Perspective article: Stimulates discussion by providing fresh, out-of-the-box, and forward-looking perspectives on existing debates and topics. May contain up to 3,000 words (text only, excluding references) in addition to a title (max. 30 words) and an abstract (max. 100 words). Perspective articles are commissioned by the editors, but suggestions are welcome.
- Note from the field: Written by policymakers or practitioners to highlight needs for further knowledge generation and/or to share lessons learned from practice. May contain up to 3,000 words (text only, excluding references) in addition to a title (max. 30 words) and an abstract (max. 100 words).
- Comment: Puts an article published in *Transactions in Urban Data, Science, and Technology* in the previous six months into perspective, either by highlighting its relevance or pointing out its shortcomings. May contain up to 500 words in addition to a title (max. 30 words) and no more than 12 references.
- Data descriptor: Describes all kinds of urban datasets in detail. The description should include the methods used to collect the data and sufficient technical analyses to support the quality. May contain up to 6,000 words (text only, excluding references, tables, and figures, but including table/figure titles and legends) in addition to a title (max. 30 words) and an abstract (max. 200 words). Links to the datasets are required to be submitted together with the article.
- Data visualization: Visualizes and describes all kinds of urban data. The description should include data collection methods, visualization methods, and discoveries. May contain up to 4,000 words (text only, excluding references, tables, and figures, but including table/figure titles and legends) with one

or two high-resolution images in addition to a title (max. 30 words) and an abstract (max. 200 words). Links to the visualizations are required to be submitted together with the article.

- **Practical case:** Covers a brief description of how a city is influenced by disruptive technologies; an account of contemporary conditions, problems, or issues; and a critical review of the current policy, planning, or management responses. May contain up to 3,000 words (text only, excluding references) in addition to a title (max. 30 words) and an abstract (max. 100 words).

Transactions in Urban Data, Science, and Technology will feature one special issue per year on an extraordinarily timely and important topic. The special issue might be commissioned to guest editors. We welcome proposals from prospective guest editors who wish to submit a call for papers and a supporting case for consideration by the editors of *Transactions in Urban Data, Science, and Technology*. Materials can be sent to the most appropriate chief/associate editor depending on the topic. All topics should focus on the Chinese context. Guest editors will typically be responsible for sending papers out for review, reaching initial editorial decisions (the journal editors will have the final say on all the decisions), and ensuring timely submission of the whole set of special issues for section papers.

To summarize, *Transactions in Urban Data, Science, and Technology* aspires to be a pioneering journal for readers across the multi-disciplines. Its innovation is three-fold. First, *Transactions in Urban Data, Science, and Technology* focuses on the emerging topic of how disruptive technologies shape the new science of cities and the science of new cities in the context of the Fourth Industrial Revolution. Second, this journal focuses on introducing Chinese cities from an international perspective, while others widely accept studies of cities around the world. Thirdly, *Transactions in Urban Data, Science, and Technology* is more flexible in article forms, allowing the new science of cities and the science of new cities to be presented and synergized across multiple dimensions here.

We hereby express our warmest gratitude to our publisher SAGE, for being receptive to the idea of this journal. We welcome the immediate submission of papers, as well as proposals for special issues. Together, let's meet the challenge of the Fourth Industrial Revolution and make it benefit cities and people.

Ying Long

School of Architecture, Tsinghua University

Jiangping Zhou

Faculty of Architecture, The University of Hong Kong

Jianghao Wang

Institute of Geographic Sciences & Natural Resources Research,
Chinese Academy of Sciences.

Yao Shen

College of Architecture and Urban Planning, Tongji University

Fan Zhang

Senseable City Lab, Massachusetts Institute of Technology