

*Preface from "Space Syntax in China"  
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The research and application of Space Syntax in China started fairly late comparing to its counterparts. The earliest publications are two papers in *New Architecture* journal in 1985, respectively "Space Syntax: A Different Urban Perspective" by Bill Hillier (translated by Bin Zhao) and "A discussion about "Space Syntax Paper"" by Dongsheng Jin. This new perspective that studies spatial forms with the assistance of computer did attract attention of many scholars. However, due to an insufficient understanding of its theoretical principles, many criticisms were raised. The attempt to analyze the human behavior in space with computer technologies was questioned for its lack of social and humanistic concerns. As a result, after the short wave of enthusiasm, very few domestic scholars kept working in this field, let alone using the tool in design practice.

Entering the 21th century, the theory, application methods and case studies of Space Syntax have been introduced to China by many publications in a comprehensive manner, especially by the "Space Syntax" monograph of the *World Architecture* journal, hosted by Tsinghua University, in 2005; *Space Syntax and Urban Planning*, co-authored by Prof. Bill Hillier and I and published by Southeast University Press, in 2007; and the Chinese version of *Space is the Machine* in 2008. The *Space Syntax and Urban Planning* book is divided into three sections. The first section is an authoritative, concise and clear elaboration of the theory and application of Space Syntax by Prof. Hillier, which establishes the basic understanding of the theory, principle and methodology of Space Syntax for Chinese scholars. In the next section we selected four relatively typical cases in China for analysis, intending to guide the readers on how the theory can be applied to the urban planning practice. The third section is a round-table debate, in which we invited five scholars in relevant fields to voice their opinions on the topic of Space Syntax. In a way, this book has objectively reflected the status of the research and application of Space Syntax in China at the time, as well as people's understandings of it. The book was quickly sold out after publication, was well received in China, and generated a great deal of interest among young scholars and graduate students. Most importantly, it drew attention from the urban and rural planning practices, inspired enthusiasm of the professional planners, and made significant contributions to the development of Space Syntax in China. Encouraged by the excellent feedback, the publisher has repeatedly proposed re-printing or re-publishing the book. After careful consideration, I did not accept the proposal of re-publication, but

instead decided to write a new book-*Space Syntax in China*, mainly because of three concerns on the current status of the development of Space Syntax in China:

First, the accomplishments that Space Syntax has achieved as it gains progress in China need to be re-evaluated. The research and application of Space Syntax in China has entered a new phase as the theoretical introduction deepens, the practical exploration furthers, along with the returning of a group of scholars who have graduated from institutions that focus on the research and education of Space Syntax, and the involvement of professional organizations such as Space Syntax Limited in the development of Space Syntax in China through collaboration or direct applications in China.

One of the most evident accomplishments is that Space Syntax has changed people's basic understanding of space. Ever since the ancient time, people have naturally believed that the contents of urban space is within the realm of people's perception and sensibility. Therefore, urban planners and designers have always described them in a simple and direct way. Space was thought to be a completely passive product of people's needs, and this understanding has become a habitual thinking pattern. As a rational analytical tool that can be utilized on parts and wholes of cities, Space Syntax has demonstrated, through the quantitative analysis and practical application in China, that there is correlation between the form and function of space, that the form of space reacts on and influences people's behaviors in the space, and that there is inherent logic between form and function. Finally, we cannot conduct spatial researches and urban planning projects on the sole basis of intuition when Space Syntax has already offered a rational, scientific and systematic tool.

At the end of 2014, the total number of Chinese publications related to Space Syntax was about 515, 96 of which were supported by the National Natural Science Foundation. This indicates that Space Syntax has been recognized and widely used as an effective scientific research approach. These researches have involved various fields, including analysis, research and design of urban and rural living environment, and touched on different locations and time span. Based on the directions of Space Syntax's practical application, they can be grouped into three categories - quantitative analysis of spatial composition, relationship between space and cognition, and relationship between space and social economics. As for the academic fields Space Syntax has been applied to, the researches have covered a multitude of fields, including urban and rural planning, architecture, landscape design, geography, sociology, etc. The spatial scales of the researches vary from the macro scale of city/town clusters and the system and structure of the whole city to the mid-range scale of cityblocks and streets, and to the micro scale of building clusters and individual buildings. Regarding the timeframes the researches have focused on, some have studied evolutions of historical cities and towns, some have explored the organizational structures of contemporary cities and towns' systems and spaces, and others have even forecasted future spatial developments of cities and towns with the aid of the Space Syntax theories. These researches, explorations and application vary in depth and breadth, and they have shaped the whole picture of the application and evolution of Space Syntax in China as they inter-

weave and permeate with each other.

Second, the problems that have emerged as Space Syntax advances in China need to be addressed. In the big picture of the application and evolution of Space Syntax in China, the lacking of systematic theoretical education and methodological training stands out prominently as the greatest hurdle to its development. Compared to the theoretical researches and technical advancements in other countries, China is basically in a “take-it-all-in” phase. Observing from the statistical data on the 55 NNSF grants, 515 papers and numerous practical application cases that are related to Space Syntax, we can see that only 4% of them have really touched on the regeneration and development of the original theory, or innovative improvement of the techniques. Most of these authors have studied in foreign colleges or research institutions that focus on Space Syntax. This indicates the education and training on Space Syntax in China is still relatively underdeveloped. It is not yet able to form a sophisticated system of education and research.

For the aforementioned reasons, problems on the theoretical understanding and scopes of application have aroused in the application and research of Space Syntax in China. In some researches, Space Syntax is incorrectly employed as a method of forecasting the direction of urban space development, resulting in a tendency of space determinism in urban development. Apparently, this is not the original intention of Space Syntax. The assumption that future development of urban spaces can be deduced from their spatial configuration or topological relationship, or that the space will inevitably develop into an “ultimate blueprint” of certain form, is what the basic principles of Space Syntax disapprove. The technical support that Space Syntax offers is mainly to determine the relationship between spatial forms and functions of behavior in a self-organization, and therefore prove that space is an integrated system that could be sound or faulty, and that changes of any parts in a spatial structure will lead to changes of the structure of the system. Strictly speaking, Space Syntax cannot take the substantial responsibility of predicting the transformation of the developmental structure of cities. Therefore, some of the Chinese researches that employ Space Syntax to predict the future development of urban spatial structure are fundamentally flawed.

Similarly, there are quite a few faulty applications of the techniques in the practical field. Some researchers have compared the integration and choice values of shopping centers in different cities, and evaluate their spatial qualities based on the numerical values. As we know, the numerical values of variables in different Space Syntax cases cannot serve as basis for spatial quality comparisons between different cases, especially between different cities.

The most wide-spread problem is that most professionals would simply apply other cities' values to their own models when choosing the specific values of depth or radii, instead of finding values that suit their own cities through compatibility analysis after conducting field researches and tests. The flaws in this application method would easily result in wrong conclusions or even mislead researches or designs.

Third, the future of Space Syntax's development in China needs to be explored. The optimization of current planning techniques and approaches in China requires the technical support of Space Syntax. For example, presently the arrangement of service facilities for urban neighborhoods is still based on population, and spatial locations are still based on their geometrical or geographical centers, or on design professionals' experience. Space Syntax treats the city as a complex, undividable and comprehensive self-organization; and by computing on the relationship between its internal spatial network and human behaviors, it forms subdivisions that are no longer based on superficial perceptions but on actual behaviors of users. Space Syntax reveals the logic relationship between the internal structure of urban material spaces and social functions, and therefore generates many fields of application that explore the relationship between spatial network configuration and urban activities.

The new urbanization and urban transformation in China offers a more expansive prospect for the application of Space Syntax, especially when confronted with the growing number of issues on the planning and design of existing land in old cities. Applying Space Syntax to the analysis of the old cities' spatial network and view corridors can contribute significantly to the initial research on mending transportation networks, determining the nature and intensity of land use, organizing public spatial systems and elevating spatial dynamism in these regions. It can also pre-evaluate the outcome of urban planning and design efforts. This could change the conventional planning and construction approaches that rely on intuition, and offer technical support that help avoiding destructive constructions that do not respect the existing built environment.

Space Syntax is essential for the Chinese socio-cultural researches and domestic spatial studies to venture into new realms. After analyzing the statistical data on the application of Space Syntax in China, we believe that Space Syntax offers a rational mode of thinking and an effective method of spatial analysis, and this mode and method itself is indifferent to the heterogeneity of culture and form. Judged from the results of its application, it is compatible to the analysis and research of the living environment in China. However, the uniqueness of Chinese urban and architectural configurations and Chinese socioeconomic culture brings new challenges to the theory and methodology of Space Syntax. To answer these challenges, Space Syntax has to further advance its theories and develop its techniques. For instance, in the spatial analysis of the Chinese gardens, because of the compositional complexity of their visibility, accessibility, meandering paths and virtual targets, as well as the particularity of their spatial components such as hills, rocks, water and scenery, there have always been technical and theoretical confusions in Space Syntax's analysis. Presently, researchers are attempting to explore the solutions to this problem by improving the components and methodology of Space Syntax. The spatial configuration and evolutionary rules of the archetypes and features of the Chinese living spaces needs to be studied and explored. They are essential components of the global urban and architectural culture, and the researches on them will undoubtedly enrich the archetypal development of the theo-

retical researches on urban spaces worldwide.

Meanwhile, with regard to the theoretical intensification and technical development of Space Syntax, China will also contribute considerably in the future. With the advancement of spatial analysis technologies such as computer technologies, simulation models and GIS technologies, the combination of Space Syntax and these technologies can establish more sophisticated, accessible and accurate models that depict and analyze urban and architectural spaces. Through the integration of technology and accumulation of basic data and information, we can conduct multi-scale, multi-field and multi-level analysis on cities, and architectural-level, urban-level or even regional-level data analysis. We can also carry out detailed visibility analysis by zooming in between buildings or between buildings and streets, and therefore analyze the relationship between spatial configurations and human behaviors, and explore the techniques in combination with practical application in China.

In summary, the vision of this book focuses on the latest development, its potential problems and future development of Space Syntax in China.

In July 2012, doctorate student HanLu and I started the preparation work on this book. During this period, we contacted Prof. Hillier for this matter. Expressing his intent to participate, Prof. Hillier actively supported the development of Space Syntax in China and the publication work, as he has always done. Then we were honored to recruit many Chinese experts and scholars, who have endeavored to further the research of Space Syntax and achieved great outcome, to work on this book. They represent the typical research methodology and technological altitude of the current stage. After many rounds of communication and discussion, we finally decided on the outline and practical cases of the book in November 2012. During the whole process from the preliminary draft, the second draft to the final draft, we had gone back and forth with the authors for many times on the emphasis, key issues, technical approaches and layout of the articles, and eventually achieved the integrity of the book. Dr. Xiaoling Dai from Zhejiang University of Technology has made tremendous contributions to the initial outline and final completion of the book. She received her Master's degree from University College London, and since her graduation, she has been striving to promote the advancement of Space Syntax in China. She has served as a link between the Chinese researchers on Space Syntax and UCL, especially on the ways of their communication and collaboration.

The book consists of three parts. Part 1: "Theory & Method Exploration", include Chapter 1 to 3. Chapter 1 "The application and development of Space Syntax in China" is written by me, which summarizes the beginning and development of Space Syntax researches in mainland China and its application in many fields. Chapter 2 "Spatial Sustainability: The Triple Function of Street Networks in Cities" is written by Prof. Hillier from University College London (translated by Tao Yang) which introduces the latest theoretical trend and the development of application software of Space Syntax. Chapter 3 "A New Modeling Method of Axial Map Drawing by Introducing the Rule of Spatial Competition" is written by Dr. Runqing Shao from Southeast University, which addresses technical diffi-

culties in analyzing modern grid-type urban space by syntactic model and proposed modification methods.

Part 2: “Application in Researches and Practices”, includes Chapter 4 to 12. With empirical evidences from domestic scholars’ typical researches, this book sorts out basic research methods in China in relation to the application of Space Syntax in three different directions: Urban and rural planning, Architecture and Landscape Architecture, and presents research findings of different directions. Chapter 4 “Analysis of Historical Evolution of Urban Space: A Case Study of Lijiang” is written by Dr. Haofeng Wang and Prof. Xiaojun Rao from Shenzhen University; Chapter 5 “Analysis of Urban Spatial Structure from Perspective of Configuration: Taking three Settlements in the Jiangnan Region as Examples” is co-authored by Dr. Xiaoling Dai, Prof. Li Li and Prof. Yong Chen from Tongji University; Chapter 6 “Morphology and vitality of Neighborhood Road Network as Exemplified by Beijing and Tianjin” is written by Dr. Qiang Sheng from Beijing Jiaotong University; Chapter 7 “Street Network Density and Land Development Intensity: A Case Study of Shenzhen Special Economic Zone” is co-authored by Haofeng Wang and Su Shi from Shenzhen University; Chapter 8 “Multi-scale Spatial Research of Neighborhoods as Exemplified by Sanfang-Qixiang of Fuzhou City” is co-authored by Prof. Jiangang Xu from Nanjing University, Zhongguang Chen from Fujian Provincial Department of Housing and Urban-Rural Development and Peizhen Wang also from Nanjing University; Chapter 9 “Spatial Structure of Classical Chinese Gardens and Recreation Behavior: A Case of Yiyuan (The Garden of Pleasance) in Suzhou” is written by Dr. Zhiming Li from Nanjing Forestry University. Chapter 10 “Street Network and Center System of Comprehensive Urban Planning as exemplified by Fuyang” is written by me and Han Lu; Chapter 11 “Space Shaping of Dynamic Neighborhoods Based on Logicality of Urban Space as Exemplified by Redevelopment of the Nanjing Honghua Airport Area” is co-authored by Runqing Shao, me and Yiren Yang from Southeast University; Chapter 12 “Landscape Design for Urban Waterfronts as Exemplified by Xinglin Bay in Xiamen” is co-authored by Prof. Xiangrong Wang, Huaen Qiu and Dr. Jingwen Wang from Beijing Forestry University. These nine cases elaborate from the diverse scales of towns, streets and landscaping and can demonstrate objectively domestic scholars’ understandings of Space Syntax and its applications at present.

Part 3: “Development and Challenges in the Future” includes Chapter 13 to 15. Among these, both Chapter 13 and Chapter 15 are written by me. Chapter 14 is written by Tim Stonor (translated by Tao Yang), both the managing director of Space Syntax Limited and Visiting professor of University College London. I have often encountered various misapplications and misinterpretations of Space Syntax theory and method over the years in the process of project review, thesis oral defense and reading of periodical thesis. Taking this situation into account, Chapter 13 reflects and discusses difficulties and misunderstandings of Space Syntax in its development in China from the aspects of support platform, theoretical technology and method recognition in order to correct present wrong understandings from some researchers and users. In Chapter 14, Stonor’s writings help readers to gain

more in-depth knowledge about the Space Syntax consulting company, which involves mainly the background and organization of the company as well as its future development plan in China. Finally in Chapter 15, on the basis of present situation of international development and application, I express my own opinions about more effective application and development of Space Syntax in China in the hope that more valuable opinions can be drawn.

Hereby I shall express great gratitude to Professor Hillier for his support and help given in publishing this book and its precedent; also thanks shall be extended to my every colleague who spares all efforts from his or her busy work to assist in everything of publishing; I shall thank Xiaoling Dai and Tao Yang from Ministry of Housing and Urban-Rural Development of PRC for their timely coordination and communication with our British colleagues. Tao Yang also helps in translating articles from English to Chinese. Besides, I would like to thank Jia Hua, who is a registered architect in the United States, for translating the preface of this book into English. Furthermore, my sincere thanks shall also be extended to Mr. Buzheng Xu and Editor Huiyu Sun from Southeast University Press for their valuable suggestions; I shall also appreciate Han Lu for her help on collecting information in the preliminary stage and correspond with every co-author for exchange ideas during the editing phase of the book.

Lastly, sincere thanks shall be extended to our general readers for your care and support on the two books: *Space Syntax and Urban Planning* and *Space Syntax in China*.

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