

本文引用格式 / Please cite this article as:

Jiang, B. (2019). Nine Questions toward Influences of Emerging Science and Technology on Urban Environment Planning and Design. *Landscape Architecture Frontiers*, 7(2), 66-75. <https://doi.org/10.15302/J-LAF-20190206>

九问： 浅论新科技对城市环境规划与设计的影响

NINE QUESTIONS TOWARD INFLUENCES OF EMERGING SCIENCE AND TECHNOLOGY ON URBAN ENVIRONMENT PLANNING AND DESIGN

1 图像技术

当下，电子图像已经成为传播和体验设计成果的主要方式。如果说现代主义时期的精英式媒体对图像的制造和传播有着某种下意识的克制和筛选——出于专业要求，更由于技术和商业模式的限制——那么当代广泛普及的电子技术已经使人们在廉价甚至免费的图像海洋中不可自拔。不仅仅是设计师，每个人都扮演着图像生产者和消费者的角色^[1]。图像如此轻易可得，又如此令人迷惑。从某种角度讲，这一前所未有的变革代表着时代的进步，但其对于场所设计的影响则复杂且诡谲。究竟是设计观念创造了图像，还是图像创造了设计观念？^[2]这一问题在当代和未来愈发变得难以回答。

<https://doi.org/10.15302/J-LAF-20190206> 收稿时间 RECEIVED DATE / 2019-03-02 中图分类号 / TU984, TP18, C39 文献标识码 / B



姜斌*

香港大学建筑学系园境建筑学部助理教授、博士生导师，城市环境与大众健康虚拟现实实验室主任

JIANG Bin

Assistant Professor and Doctoral Supervisor in the Division of Landscape Architecture of Faculty of Architecture, Director of the Virtual Reality Lab of Urban Environments and Human Health at the University of Hong Kong

*通讯作者

地址：中国香港特别行政区香港大学香港薄扶林道纽鲁诗楼614房

邮编：999077

邮箱：jiangbin@hku.hk

摘要

科技在近十年来发展迅猛已经是不争的事实，它正在不断挑战和刷新人们对城市环境、人类生活，甚至是人性本身的固有认知。同时，它对城市环境规划与设计的冲击也不容忽视，且需要相关规划设计人员积极应对。科技并没有严格的权威定义，它是一个不断自我更新的概念。狭义而言，人类发明或发现的新材料、新技术和新数据等属于科技范畴；广义而言，其也可包括由新材料、新技术和新数据产生的新的行为、情感、观念和哲学。本文从图像技术、被图像驯服的设计、设计师的困境、虚拟现实、个人移动电子设备、大数据技术、肉身桎梏、公共空间和自然9个方面探讨了科技的发展在当代及未来可能对城市环境的规划与设计产生的积极或消极影响。鉴于这一讨论目标的宏大性，本文只是一种挂一漏万的尝试，并未为所提出的问题提供确凿的答案，而希望通过对9个重要话题的探讨，促进读者对这些问题的深入了解和独立思考。

关键词

科技；城市环境；规划设计；人类未来；反思与疑问

ABSTRACT

There is no doubt that science and technology have progressed rapidly in the past decade and it is constantly challenging and refreshing people's understanding of urban environment, human life, and even human nature itself. Meanwhile, its impact on urban environment planning and design should not be ignored and needs to be addressed promptly. The concept of science and technology is self-renewing and has no universal or authoritative definition. In a narrow sense, new science and technology may cover any new materials, technologies, and data invented or discovered by a human; in a broader sense, it might also study new behaviors, emotions, concepts, and philosophy arisen by new materials, technologies, and data. This article explores both positive and negative impacts of science and technology development on urban environment planning and design from nine aspects: image technology, image-tamed design, designers' dilemma, virtual reality, personal mobile electronic devices, big data, human physical limits, public spaces, and nature. Instead of trying to provide definite answers to these questions, this article seeks to encourage readers' to understand and think of these topics through a brief discussion.

KEY WORDS

Science and Technology; Urban Environment; Planning and Design; Mankind's Future; Reflections and Questions

整理 王颖 翻译 杨雨雯 田乐

EDITED BY WANG Ying TRANSLATED BY YANG Yuwen Tina TIAN

1. 被复制的图像与被图像化的城市空间
1. Urban space created from replicated imagery

图像技术使得对场所的高度表达和复制变得轻而易举。一方面，我们的城市变得更加单调乏味和缺乏匠心；另一方面，少数“美景”被反复用于图像制作，成为一锅十年不换的“老汤”，被大众反复欣赏和消费。于是，在绝大部分时间里，我们身处粗劣甚至恶俗的城市环境中，却在方寸屏幕前享受着令人神往的“美景”——那些由图像所传达的、二手的诗境或彼岸。更为可悲的是，设计师甚至是三手、四手图像和观念的生产者。当前大量的设计作品是从图像（来源于设计杂志、书籍和网站等）到设计的一种武断而粗糙的翻译和拼接，并常常被作者冠以“原创”的名头（图1）。当初满腔热血、欲以创造理想人居环境为己任的设计师，如今要做的是适应“规则”。当他们的身体和灵魂离开了真实的土地和丰富的生活，而囿于公式一般枯燥的小区、地铁和写字楼，这种所谓的“原创”便是他们谋生的必然甚至唯一途径。

2 被图像驯服的设计

这个时代的设计师已经变得如此“体贴”，他们在绘制草图的时候就已经开始下意识地考虑：当设计项目被制作成可在各大设计或社交网站传播的图像后，如何成功地吸引远端屏幕后的无数双眼睛^{[3]-[5]}。而在项目建成以后，设计师对图像效果的关心也远远超过对大众使用感受的关心。当前大部分设计项目（包括一些著名设计），其真实的体验效果可能已远远不及网络图像的传播效果重要。“网红”项目甚至不需要过分担心自己的品质——许多人造访的主要目的不再是追求完整和连续的场所体验，而是寻找可作为摄影对象的地点，而后在美



1 Image Technology

Nowadays, digital image has become a major medium to spread and experience design. If the elite media of the modernism era had represented some kind of subconscious reservation and screening over the production and spread of images (for professional requirements and by technical and business-mode limitations), then the widespread of digital technology today has made people lost in numerous low-cost or free images. Everyone, not only designers, is a producer and consumer of digital imagery^[1]. In a sense, the high accessibility of digital images represents the progress of this era, which, however, brings a complex and unpredictable impact on spatial design. Is it true that human's design concept creates images or do images produce human's design concept?^[2] This question is becoming much more difficult to answer in the present and future.

Image technology makes it easy for designers to represent and replicate places. On one hand, this is making urban landscapes monotonous and lack of originality. On the other hand, a small number of “beautiful scenes” or “attractive features” have been replicated over years for image production of public spaces. Therefore, for the most part, people who live in a poor-quality urban environment prefer enjoying such second-handed “beautiful scenes” in front of screens. More pathetically, designers have become producers of these third- or fourth-handed images and ideas — a large amount of “original” works today are nothing but an arbitrary mishmash of images from magazines, books, or websites (Fig. 1). Designers, who enthusiastically and faithfully believed that they are responsible for the stewardship of our urban environment with a mission of creating ideal living environments, are now confining themselves within the mire of the profession. When detached from the earth (site) and everyday life and trapped in dull communities, subways, or office buildings day after day, designers make their living by this so-called “original design” inevitably.

2 Image-Tamed Design

Today, most designers are so “considerate” that at the very beginning of a project, they subconsciously consider how to attract public attention with alluring images for a greater and faster spread on major social media and design websites^{[3]-[5]}. After the construction of a project, designers' concern for visual pleasure far exceeds that for users' experience. It seems like that the site experience of most public places (including a number of famous ones) are far less important than its popularity on social media. For those popular destinations on social media, visitors

图软件的协助下制造下一批可供炫耀和传播的图像（图2）。因此，对许多设计师而言，风靡网络世界可能比满足甲方的具体需求更为刺激、过瘾和有利可图。再者，即使是某些颇具专业性的国际设计大奖，也常常将图像作为主要的评审依据^[6]。由于时空限制，评审专家无法一一造访申报奖项的项目。由此，如何制作出好的图像其实已成为许多项目极为重要的现实诉求，因为只有那些富有“创意”、撩动人心的图像才是夺得桂冠的重要凭借。

3 设计师的困境

如今已经很难断言设计师是否依旧是时代的弄潮儿了。在以大规模政府投资和网络经济为主导的当下，设计师的角色无论就物质生活、精神体验，还是社会影响力而言都已日渐式微。虽然这种论调是残酷的，但却是不得不正视的现实。而长久依赖设计师而存在的审美及伦理追求，已经不再具有感染力。在这个纷繁的时代，追求超越时间和物质的情感体验似乎已成为“迂腐”“保守”的代名词。身处资本的洪流之中，大部分设计师已经在使用迎合投资者的词汇和概念。于是乎，在生存本能的驱使下，设计师常常把“区块链”“大数据”“人工智能”“智慧城市”等概念挂在嘴边，这是对科技与时代发展的顺应，还是一种媚俗与无奈，抑或二者皆有之？在这种情况下，设计师该如何定义和发展自己的价值取向、知识基础和工作方法？

4 虚拟现实

近年来，虚拟现实技术已被逐渐应用于各个行业，其中也包括规划和设计行业，这是一个诱人却也充满变数的发展方向。当前的虚拟现实技术可以弥补人们空间感知力和想象力的不足，实现瞬时的空间

care less about pursuing a completed and smooth experience of a place; instead, people are searching for spots which can serve as an object of photographing. Then they can create the next batch of photoshopped images to show off and to circulate them on social platforms (Fig. 2). For many designers, becoming popular on the internet may be more exciting, gratifying, and profitable than crafting a design work that well meets the needs of clients. Moreover, quite a few professional international design awards emphasize heavily on graphic expression and take digital images as a major consideration for submission review and selection^[6]. Due to physical and temporal limits, the jury cannot visit every project in person. As a result, submissions that create “interesting” and eye-catching images might have a greater possibility to impress the jury.

3 Designers' Dilemma

It is difficult to assert whether designers are still pioneers of the times or not. Today, driven by large-scale government investment and cyber-economy, the role of designers has gradually declined in terms of material life, psychological experience, and social influence — this is a cruel yet undeniable fact. The aesthetic and ethical values advocated by designers are no longer appealing. In this era, seeking emotional experience beyond time and materialism seems synonymous with stubbornness and conservativeness. In the current climate of capital, many designers are already using buzzwords and popular concepts that cater to investors. Designers are used to playing with hot concepts such as blockchain, big data, artificial intelligence, and smart city. Is this an adaptation to the age and technology development, or a manifestation of designers' obsequiousness or helplessness? Under these circumstances, how should designers define and develop their value orientation, knowledge body, and working methodology?

4 Virtual Reality

Virtual reality has been applied in various industries in recent years, including the planning and design industry. It is a promising market, but, at the same time, with uncertainty. Currently, virtual reality technology can make up for human's lack of spatial perception and imagination, and support instantaneous spatial adjustment and visual material switching. This is not a completely novel concept, and can be realized through cutting-edge technologies^[7]. The combination of virtual reality and other technologies (such as artificial intelligence) may threaten or even replace the role of traditional designers because



2. 被践踏的粉黛乱子草 (*Muhlenbergia capillaris*): 糟糕的场所并不影响个人图像的制作。
3. 简单的物质空间叠加复杂多变的虚拟表皮
4. 虚拟环境体验可用于减少患者的焦虑和疼痛。

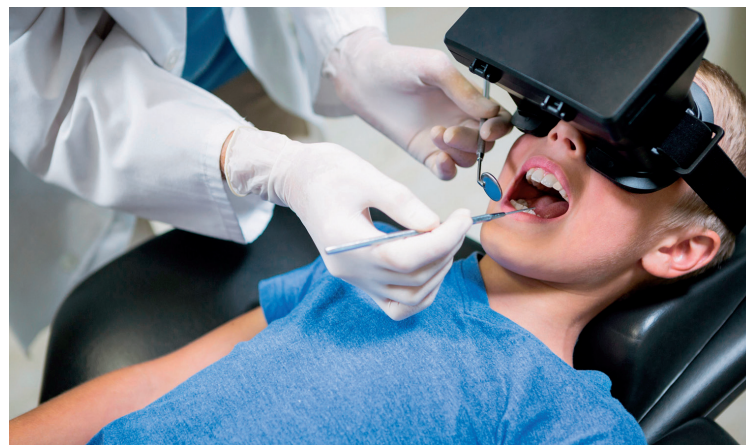
2. Hairawn muhy (*Muhlenbergia capillaris*) trampled by visitors: images are produced by individuals even in poor-quality places.
3. Diverse virtual surfaces blended with a simple physical space
4. Patients may feel relaxed and less painful when experiencing scenes created by virtual reality.

调整和视觉材料切换。这本不是一个全新的概念, 只需通过强有力的科技手段即可实现^[7]。不可否认, 虚拟现实与其他技术(如人工智能)的结合可能严重冲击甚至取代传统设计师的地位, 因为绝大多数设计师所依赖的知识、经验、天分甚至情感, 在未来的机器学习和人工智能技术面前都可能显得笨拙而无力^[8]。

此外, 虚拟现实的发展可能使我们放弃对真实场所营造的追求, 这种追求已经绵延人类历史数千年, 成为文明的重要载体和传播工具。虚拟现实的逻辑在于使用通用的视觉(或其他感官的)材料来形成城市空间的表皮(图3)。试想, 如果我们可以通过虚拟现实轻松地将一个简单的空间转化为拥有蓝天、绿茵、花朵和精美装饰的场所, 那么投资者和设计师是否还有动力去改造物理空间环境? 随着技术的发展, 虚拟现实可以根据场地空间特征和使用者活动特征即时计算和输出特定的空间表皮、光线和气味等多种物理特征, 这种百变的满足感是否会让我们觉得一成不变的传统空间设计索然乏味?

诚然, 虚拟现实的积极意义和必要性不可否认。在某些特定环境中, 虚拟现实可能是寻求人类健康生活的重要方式或重要补充^{[9][10]}。这些环境包括医院、监狱、戒毒所、制造业工厂, 以及囿于自然条件无法提供健康的精神和身体体验的恶劣环境(如南极)等。例如, 身体的苦痛使得病人常常被限制在医院甚至病房的方寸之地, 此时虚拟现实可以为患者提供超越物质场所的精神体验, 这种体验本身就是一种重要的治疗手段^{[11][12]}(图4)。

虚拟现实的另一大重要潜力在于其可在不违背伦理的情况下开展针对环境与人的实验性研究。通常, 实验性研究有两个要则: 随机分组和组间对比。例如, 将研究对象强行分配到不同的社区居住是不符合伦理的(即便是善意的); 剧烈改变环境以实现截然不同的组间对



4 © 图虫创意

the knowledge, experience, talent, and even emotional capacity of most designers may be inferior compared with products supported by machine learning and artificial intelligence^[8].

In addition, the advance of virtual reality may lead people to give up creating places in reality, ending the history of human construction which has stretched for thousands of years and served as an important embodiment and spreading tool of civilizations. Virtual reality is about employing universal visual (or other sensory) materials to form the surface of urban spaces (Fig. 3). Imagine that if we could easily transform a simple space into a site with blue sky, green spaces, flowers, and beautiful decorations using virtual reality technologies, will investors and designers still be interested in improving physical environment? With the advancement of technology, virtual reality is expected to calculate and generate a variety of features for experiencing, such as spatial surface, light, and odor, based on the spatial characteristics of the site and the patterns of human activity. Will such diverse alternations of space make traditional spatial design eclipsed?

Admittedly, virtual reality has its positive impact and necessity indeed. In some settings, virtual reality can provide an important aid for human health within the environmental setting with physical limits^{[9][10]}, including hospitals, prisons, drug rehabilitation centers, factories with poor or hazardous conditions, and harsh places (such as the Antarctic area) where it is hard to provide necessary environment for healthy mental and physical experience. For instance, virtual reality can provide patients in hospitals with a spiritual experience beyond the physical site. Such experience itself is also an important treatment^{[11][12]} (Fig. 4).

Another great potential of virtual reality is that it supports experimental research on environment and human in ethics. In general, experimental research is conducted on two



6 © 姜斌

比也是不符合伦理的。虚拟现实可以在很大程度上突破这两大限制^[13]：研究对象在实验室里被随机分配到不同的虚拟实验环境中，而不是被迫居住于某真实的场所。同时，研究者可以通过虚拟现实技术模拟同一空间尺度的不同场景（例如为同一条街道赋予不同的绿化程度），以精确评估各项关键环境要素^[14]。虽然虚拟现实技术暂时无法完全再现人们在真实场所中的全部感知，但我们无法否认其巨大潜力，未来它或许可以高度精准地模拟真实场所特征对人类的影响。但是，一旦实现了虚拟现实对真实环境高度精准的、全感官类型的模拟，人类是否会面临新的伦理问题？这是极有可能的。

5 个人移动电子设备

个人移动电子设备是最近10年中对人类生活方式颠覆性最大的科技产品之一^[15]。一方面，它使得每个人都成为了媒体发布平台。这种个人视角或尺度的信息发布致使每个人的日常体验能够轻易就被他者进行代入式体验和窥探。掌握了如此丰富的信息来源，即使不进行田野调查也可以通过网络获得大量普通人的体验数据。藉此，设计师拥有了更多机会来了解普通人的心理、行为和态度，这对于摆脱精英式的设计思维和手法大有帮助。但值得注意的是，如果过分依赖电子设备使用者所生产和传播的数据，在某种程度上，非电子设备使用者（如部分儿童、老年人、残障人士、文化水平或经济水平较低的人群等）的需求就可能被忽略^[16]。

另一方面，电子设备的广泛使用已经使得人们将大量时间与注意力集中在屏幕上。电子设备上瘾（或被称为“科技上瘾”）问题越发严峻，且产生了诸多深远影响^[17]。

其一，城市物质空间对人的影响力在削弱。在电子设备特别是智能手机普及之前，物质空间常常在很大程度上吸引着人们的注意力并影响着人们的心理状态和行为方式。例如，在城市道路和森林公园中，人们可能因为环境的影响，呈现出截然不同的精神状态和行为方式。而在普及之后，场所的差异变得越来越模糊：无论何时何地，大家都在使用手机、平板电脑或其他电子设备（图5）。对电子设备的沉

principles: random assignment and between-group design. Taking research on community settings as an example, it is unethical to force subjects to live in different design (for an experimental purpose), or to alter environmental settings drastically for a distinct between-group design. In most cases, virtual reality can serve as an alternative approach for the experimental study^[13]: participants can be randomly assigned to different virtual environments in the laboratory, and researchers can use virtual reality to simulate different environmental settings on the same spatial scale (for example, varied vegetation densities in the same street) to accurately assess key environmental elements^[14]. Although virtual reality cannot support simulations of all human perceptions in real places, it is possible that in the future virtual reality can support highly-refined simulations of real places and impact evaluations of varied site characteristics on human beings. However, will human beings confront new ethical issues when virtual reality is mature enough to accurately simulate real environments in all kinds of human senses? The answer is probably yes.

5 Personal Mobile Electronic Devices

Personal mobile electronic devices are one of the most revolutionary products that have greatly altered human lifestyles in the last decade^[15]. On one hand, it allows ordinary people to be media agents with personal-perspective and -scaled information, making it easy for invaders to pry into and experience others' everyday life. Instead of field investigation, one can access to ordinary people's experience data from enormous information sources. The availability of information facilitates designers to understand people's psychological, behavior, and attitude patterns that are very helpful for getting rid of elite design thinking and methods. However, it is worth noting that if designers only focus on the data generated by electronic-device owners, the needs of those who are less accessible to electronic devices (such as children, the elderly, the disabled, and low-education or -income groups) would be somehow ignored^[16].

On the other hand, the popularity of electronic devices have caused a sharp increase of time people spending on screens. The problem of electronic device addiction (or called "technology addiction") is becoming serious and has resulted in far-reaching effects^[17].

First of all, the impact of physical environments on human beings is weakening. Before the popularity of smartphones and other electronic devices, physical environments often

5. 个人移动电子设备沉浸可能弱化和同化物质空间对人精神状态和行为的影 响。
5. Addiction to personal mobile electronic devices may weaken and assimilate impacts from physical environments on human beings' mental states and behaviors.



溺常常让使用者所处的物理场所（无论是在餐厅、街道、公园，还是在家中的马桶上）变得无关紧要。

其二，个人电子设备并没有为人们带来行为或心理上的解放和放松，这和设备制造商反复描绘的美景完全背道而驰。在拥有电子设备之后，人们无时无刻不在接受信息的轰炸，失去了暂时离开社交和工作的借口，甚至连短暂的休息时间都被耗费在方寸的屏幕之间^[18]。我们的身体也日趋静态，因为只有静下来才能更准确地捕捉屏幕所传达的信息。这使得睡眠缺乏、注意力涣散、精神疲劳、精神压力增大、亲子疏离、肥胖等健康问题接踵而来且越发严重^{[19][20]}。

上述一系列问题带给设计师的将是前所未有的压力和动力：如果不能消灭电子设备，我们能做什么？如果传统的设计方法不能将人们的视线和身体从屏幕上（旁）移开，那么是否需要提供更具魅力的体验方式，让人们回归并体验真正的场所？抑或，我们将不可避免地输掉这场战争，大量的城市实体环境设计师将转变为虚拟环境设计师？再或者，能否将虚拟世界和物质世界的体验相结合，突破当前电子设备所信奉的视觉和听觉体验的拘束，从而开辟一种全新的、健康的人类存在和体验方式？

6 大数据技术

尽管大数据优点众多，但掌握大数据不一定等于拥有大智慧。实际上，有意图的操控更容易在大数据库中实现。数据分析师深知对数据的垄断意味着绝对的权力，而绝对的权力可以导致绝对的堕落。与小体量数据相比，对大数据的修改和过滤更轻而易举且更隐蔽：即便对数据进行大量调整，普通民众也根本无法察觉。而这些数据的输出结果又会极大影响大众的心理和行为偏好，形成无可匹敌的社会观念

captured a great deal of people's attention and influenced their mental states and behaviors. For example, in urban streets and forest parks, people may have clearly different mental states and behaviors. As a contrast, after the prevalence of electronic devices, everyone is using mobile phones, tablets, or other electronic devices whenever and wherever (Fig. 5). Addiction to electronic devices often makes characteristics of physical environment much less meaningful to visitors (whether in a restaurant, street, park, or toilet at home) because their attention is not on the physical environment anymore.

Secondly, electronic devices fail to relax people, mentally or physically, which is opposite to the visions described by electronic device manufacturers. Worse, with the constant information bombardment, people are forced to pay attention to work or social interaction even during short breaks^[18]. More and more people are used to having a sedentary lifestyle, and our bodies become more static to capture the information from electronic devices accurately. This has resulted in a series of health problems such as insufficient sleep, distraction, mental fatigue and stress, parental alienation, and obesity^{[19][20]}.

These issues are challenging designers unprecedentedly, necessitating their consideration on what they can do if electronic devices cannot be eliminated. If physical spaces designed through traditional methods are not engaging anymore, is there a need for designers to provide a more enchanting landscape experience to attract people back to the real world from virtual reality? Or, will urban designers inevitably lose this war and try to train themselves into architects of virtual environments? Or, is it possible to introduce a new and healthy way of living and experience by breaking the constraints of visual and acoustic experience and integrate virtual reality with physical environments?

6 Big Data

Despite its advantages, mastering big data is not necessarily equal to mastering the wisdom. In fact, intentional manipulation is easier to implement in large databases. Data analysts know that data monopoly means an absolute power, which may lead to an absolute corruption. Compared with small amounts of data, the modification and filtering of big data is easier and more covert — even if the data is largely edited, it is almost impossible for ordinary people to detect. However, the output of big data would greatly affect public's psychological and behavioral preferences, forming an dominating social norms or behavior tendency^[21]. The acquisition, analysis, and representation of big data require rules and strong self-discipline

或行为的洪流^[21]。因此，大数据的获取、分析和表达都需要极强的约束和自律。因此，对于任何未受监督的大数据分析和解释，我们都应该保持极高的警惕^{[22][23]}。

大数据的另一个弊端在于当大部分资料被数字化，而后通过统计分析呈现出某种结果，将使得众多个体思想、意见、价值和状态无可避免地湮没于平均化的计算之中。试想，如果我们仅仅通过“豆瓣”或“烂番茄”的打分来判断一部电影的价值，那么很多真正具有开创性的作品将会被忽视。如果《红楼梦》需通过网友的点赞数和集体意见来决定下一回合的走向，它可能最终将成为晚清的《小时代》。因此，完全依靠大数据来分析、评价和决策又可能将整个社会导向一种平庸甚至有害的“公平”，而这种“公平”可能会使得看得见真理的“少数人”被孤立和遗忘。

在具体的城市环境规划与设计，过分依赖和迷信大数据将产生何种后果？首先，城市空间将成为“大多数人”意志的体现，一些具有独特价值但“小众”的场所将会被忽视甚至破坏。其二，在大尺度的城市空间变迁过程中，群体与场所之间的关系会得到重点呈现和解读，但个人与场所之间的联系以及与之相关的个体状况和遭遇则会被忽视。其三，对城市环境的功能评判、审美评判和价值评判将会被“平均化”，一些挑战传统和主流观念的规划设计实践可能会遭遇极大的阻力，由此城市环境会逐渐平庸化。最后，通过某种大数据分析产生的“大多数人”选择的城市场环境，是否等同于大多数“国民”或“城市居民”选择的城市场环境？答案或许是否定的。

7 肉身桎梏

人类囿于肉身已逾数百万年，而摆脱肉身对自己的限制是人类的永恒追求之一。无论是汽车、火车，还是宇宙飞船的出现都是人类为此而做出的努力。因此，就人体运动的关键因素（神经指挥之下的肌肉和骨骼）而言，要实现个体层面的飞跃，就必须实现肌肉和骨骼材料与结构设计的创新。所幸的是，我们似乎看到了曙光：最新研制出的人工肌肉的强度比健康成年人的肌肉强度高数百倍，而穿戴柔性外骨骼也不再是不可实现的幻梦^[24]。可以想见，未来人们在空间中的运动

of professionals. Therefore, we should be extremely vigilant to unsupervised analysis and interpretation of big data^{[22][23]}.

Another drawback of big data is that most of data is digitized and then presented through statistical analyses. This data-treatment process will inevitably equalize various individual thoughts, opinions, and values. Imagine that if we judge a movie only by its score on Douban or Rotten Tomatoes (both are movie rating websites), many truly groundbreaking works will be underestimated. If the classical novel *Dream of the Red Chamber* had choreographed the episodes according to online audience's collective opinions, it may eventually become nothing but a mediocre work in its age. Therefore, an absolute definition by big data analysis, evaluation, and decision-making may lead to mediocre even harmful "fairness," leaving the minority who see the truth isolated and neglected.

What are the consequences of over-reliance on big data in urban environment planning and design? First of all, urban space will become places for the needs of majority, and some unique "minority" places will be ignored or even destroyed. Secondly, in the process of large-scale urban spatial transformation, the group-place relationship will be given a priority for representation and interpretation, while the relationship between individuals and places and related individual experience will be much less considered. Thirdly, the functional, aesthetic, and value evaluation of urban environment will be "averaged." Planning and design practices that challenge traditional and mainstream concepts may encounter great resistance and the construction of urban environment will be mediocre. Last, is it true that building an urban environment according to big data analyses on collective needs of the "majority" equals to building an urban environment for the "majority" of citizens or city residents? Perhaps the answer will be no.

7 Human Physical Limits

For human beings, a creature that has evolved for millions of years, jumping out of physical limits is one of their eternal goals. To realize this goal, people made cars, trains, and spacecrafts as extensions of physical human bodies. With regard to the key factors of human movement (muscles and bones controlled by nerves), in order to achieve an individual-level leap, material and structural design innovation of muscles and bones must be realized. Fortunately, the newly developed artificial muscles have been hundreds of times stronger than the muscles of healthy adults, and being equipped with flexible external bones is no longer a dream^[24]. We can foresee that in the near future, human movement will be significantly changed in speed and mode, to which urban

速率和方式都会有显著变化，城市空间必然也要做出相应的改变。现有的步行经验或许已不能作为人类活动范围的测度，即使是儿童、孕妇和老年人，在不依赖机动交通的情况下，也将获得更大的活动半径和强度，以及更久的活动时长。而这种变化也必将引起城市和社区空间规划设计的深刻变革。除了运动能力的改变，人类的感官能力是否也能够通过科技有意识地增强或抑制呢？这些改变又会对人与城市环境之间的关系产生何种影响（图6）？

8 公共空间

城市的公共空间之所以在人类历史上（至少是现代历史中）如此重要，根本原因可能在于其所蕴含的丰富的不确定性^[25]。人们知道进入公共空间可以实现某些确定的目标，但人们又深知在这个过程中蕴藏着出行前无法预见的境遇。人们可以有无数种不期而遇：或邂逅、或畅谈、或交锋、或坠入爱河。即便是确定的目的地，其内部也可能蕴藏着巨大的不确定性。人们不确定今天会尝到什么新菜，遇到什么样的艺术家，或者看到哪本新书——这正是经典的公共生活的魅力所在。

但随着科技的进步，这种魅力可能正在被逐渐瓦解——人们可以在出门前准确知晓关于公共空间的大部分信息：时间、地点、人物和事件（图7）。未来我们可以提前知道宾客的名单、样貌、嗜好和家庭背景，从而决定是否去某家餐厅或酒吧；声名显赫的大师会选择不去

space must also make adaptation. The existing walking distance may no longer serve as a valid reference / measurement of the range of human activities. Children, the pregnant, and the elderly will have a greater athletic radius and intensity, and a longer athletic lasting time without the help of automobiles. This change will lead to enormous changes in the planning and design of urban space. In addition, can technology also enhance or suppress human sensory abilities? How do these changes affect the relationship between people and urban environment (Fig. 6)?

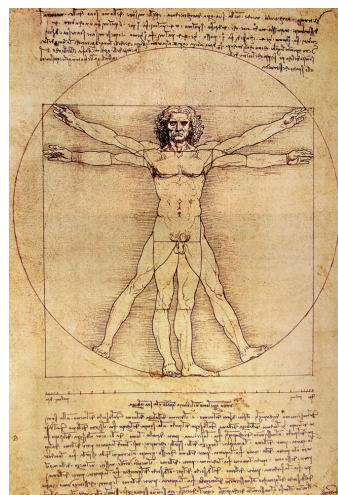
8 Public Spaces

The reason why city's public space is so important in human history (at least in the modern history) lies in its rich uncertainties^[25]. People usually enter a public space with clear intentions, but they might encounter other possibilities unexpectedly: people may meet and chat, squabble or fight, or fall in love with someone. Such uncertainties also remain significant when one visits a definite place. People always wonder what new dishes will be found in the restaurant, or which artist will show up, or what new books are recently launched. Uncertainty is one of key reasons that make urban public space full of charm.

As technology advances, such uncertainties may gradually disappear. People can know most details of public spaces, including time, location, attendees, and events, before visiting them in person (Fig. 7). In the future, we will know the appearance, hobbies, and family background of the attendees to decide whether to go to a restaurant / bar or not. Famous artists could choose to skip a coffee shop to avoid wasting time with not yet famous "Vincent van Goghs" or "J. K. Rowlings." Augmented

6. 身体是环境的根本尺度，如果突破肌肉、骨骼和感官的局限，我们可能需要完全不同的城市空间以适应这种变化。
7. 增强现实技术将显著改变我们对公共空间的认知。

6. As human body defines the scale of an environment, urban spaces have to be transformed thoroughly to adapt to changes once artificial muscles, bones, and sensory organs of human beings are realized.
7. Augmented reality technology will significantly update our recognition to public spaces.



© Academia Gallery of Venice

7 © 墨仕创意

某个咖啡厅，以避免尚未成名的“梵高”或“J·K·罗琳”，从而避免把时间浪费在“低价值”社交上；增强现实技术会告诉我们每一家店铺的最新产品及服务，以及每一家剧场的节目清单。可以预见，未来公共空间的确定性将被极大提升。人的天性是喜欢安全的环境、在可控范围内具有某些不确定性的环境，还是纯粹的冒险环境？答案尚未可知。但或许当我们极大地掌控公共空间之时，我们也已将向往的生活毁坏。

9 自然

在几百万年漫长的进化历程中，人类在城市中度过的年月只是其千分之一。自然已经深深烙印于人类的生物和文化基因之中^{[26][27]}。即使在科技如此发达的当下，我们也不难发现人类精神深处对于自然的敬畏和依赖。可以说，人类能够发展到今天，和数百万年与自然相爱相杀的漫长历程密不可分。自然让我们感受到生命的脆弱、短暂和渺小；我们又从自然中获得氧气、食物、住所和灵感。在这个过程中，我们学会了生存，也发展出了艺术、宗教和科技，这一切的努力都在不断打破和更新“生而为人”的定义。然而，科技也可能在一步步将人类的肉身和精神从自然中抽离^[18]，而自然也在人类活动的干扰下逐渐退却和萎缩。在新的科技的加持下，许多人正在变得更加自信甚至骄傲。有趣的是，随着科技的进步，科学家可以获得更为丰富和深刻的环境数据，而这些数据正在使得另外一些人变得谦逊和忧虑^[28]。

在科技不断发展的未来世代，过去人们从自然之中获取的所有物质和精神支持，未来能否从自然之外获得？在遥远的未来，也许我们不得不离开或主动放弃地球，到更广域的宇宙中寻找另一个栖身之所。在那样的环境中，是否存在更广义的“自然”？于是乎，在可预见的未来，在未离开地球之前，我们应该停止对自然的破坏和疏离，因为它是目前我们所知道的唯一的家园。自然总是在那里，它是那样的安静、沉默和被动，等着我们去践踏或爱惜。总有一天，人类会因为对它的所作所为而得到惩罚或庇佑，只是无人知晓那一刻将于何时来临（图8）。LAF

致谢

感谢香港大学建筑学系博士研究生杨雨雯参与本文的讨论和编辑。

reality technology will inform us the latest products / services of each store, or program lists of each theater. It is clear that, in the future, the certainty of public space will be greatly improved while the uncertainty will be hardly expected. Do people prefer a completely safe environment, an environment of predictable uncertainties, or places with unpredictable adventures? It is still open to debate. Perhaps as we are gaining control over public spaces, we have also destroyed the urban public life we desire.

9 Nature

Compared to the millions-of-years long evolutionary history, the time that human spend in cities is only one thousandth of that. Nature is deeply imprinted on human biological genes and cultures^{[26][27]}. It is not difficult to find that we always depend on and awe nature, even in this technology-dominated time. We have developed and co-evolved with nature for millions of years. Nature lets us understand how fragile, short, and insignificant life is, while we obtain oxygen, food, shelter, and inspiration from nature. In the evolution, humans have learned to survive, and developed art, religion, and technology. All these efforts are constantly breaking and updating the notion of “human being.” However, some new science and technology may gradually detach humans’ body and mind from nature^[18], which, in turn, is retreating and deteriorating under the interference of human activities. With the aid of new science and technology, a great amount of people are becoming more confident and even arrogant. Interestingly, meanwhile, scientists are obtaining more in-depth data of our environment which is making many other people more humble and concerned^[28].

In the future of fast science and technology advancement, is it possible for people to obtain material and spiritual support beyond nature? Perhaps in the distant future, we will have to abandon or leave our planet to find a new shelter in the vast universe. It is still unknown whether or not another “nature” exists. What we definitely know is human beings should stop destroying or alienating from nature before we decide to leave the earth since it is the only homeland for us so far. Nature always exists, in a quiet, silent, and passive way, waiting to be ruined or cherished by human beings. Eventually, we will be punished or blessed for what we have done. Although no one knows when the moment is, it will come for sure (Fig. 8). LAF

ACKNOWLEDGEMENT

Many thanks to Yang Yuwen, PhD student of the Faculty of Architecture at the University of Hong Kong, for her insightful comments and significant assistance on editing this article.

8. 科技进步使许多人变得狂妄，但如果人类在未来选择放弃自然，自然也许会同样放弃人类。

8. Arrogant they might be with advances in science and technology, human beings will be discarded by nature if they ruin nature first.



REFERENCES

- [1] Rubinstein, D., & Sluis, K. (2008). A life more photographic. *Photographies*, 1(1), 9-28.
- [2] Zhang, Y. X. (2018). Ultra-image Architecture: His House and Her House. *Time + Architecture*, (3), 65-69.
- [3] King, A. (2016, August 31). 15 of the Best Instagram Accounts for Landscape Architects. *The Dirt*. Retrieved from <https://dirt.asla.org/2016/08/22/15-of-the-best-instagram-accounts-for-landscape-architects/>
- [4] Despard, E. (2015). Photographic social media, designed landscapes and urban, place-based visibilities: In search of friction. *Journal of Aesthetics & Culture*, 7(1), 282-42. doi:10.3402/jac.v7.28242
- [5] Wainwright, O. (2018, November 23). Snapping point: How the world's leading architects fell under the Instagram spell. Retrieved from <https://www.theguardian.com/artanddesign/2018/nov/23/snapping-point-how-the-worlds-leading-architects-fell-under-the-instagram-spell>
- [6] American Society of Landscape Architecture. (n.d.). Categories and Guidelines. Retrieved from <https://www.asla.org/2018cfe/categories.html>
- [7] Song, J., & Huang, S. (2018). Virtual Reality (VR) Technology and Landscape Architecture. *MATEC Web of Conferences*, (227), 02005. doi:10.1051/mateconf/201822702005
- [8] Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? *Technological Forecasting and Social Change*, 114, 254-280. doi:10.1016/j.techfore.2016.08.019
- [9] Välimäki, M., Hätönen, H., Lahti, M., Kurki, M., Hottinen, A., Metsäranta, K., ... Adams, C. (2014). Virtual reality for treatment compliance for people with serious mental illness. *Cochrane Database of Systematic Reviews*, (10), CD009928.
- [10] Smith, M., Fleming, M., Wright, M., Jordan, N., Humm, L., Olsen, D., & Bell, M. (2015). Job Offers to Individuals with Severe Mental Illness after Participation in Virtual Reality Job Interview Training. *Psychiatric Services*, 66(11), 1173-1179.
- [11] Baños, R. M., Espinoza, M., García-Palacios, A., Cervera, J. M., Esquerdo, G., Barrajón, E., & Botella, C. (2013). A positive psychological intervention using virtual reality for patients with advanced cancer in a hospital setting: A pilot study to assess feasibility. *Supportive Care in Cancer*, 21(1), 263-270. doi:10.1007/s00520-012-1520-x
- [12] Laver, K., George, S., Thomas, S., Deutsch, J., & Crotty, M. (2012). Virtual Reality for Stroke Rehabilitation. *European Journal of Physical and Rehabilitation Medicine*, 48(3), 523-530. doi: 10.1161/STROKEAHA.111.642439
- [13] Pan, X., & Hamilton, A. (2018). Why and how to use virtual reality to study human social interaction: The challenges of exploring a new research landscape. *British Journal of Psychology*, 109(3), 395-417.
- [14] Jiang, B., Larsen, L., Deal, B., & Sullivan, W. C. (2015). A dose-response curve describing the relationship between tree cover density and landscape preference. *Landscape and Urban Planning*, 139, 16-25. doi:10.1016/j.landurbplan.2015.02.018
- [15] Gaviola, A. (2017, July 28). How our addiction to digital technology is changing the way we live. *CBC*. Retrieved from <https://www.cbc.ca/news/business/tech-trap-attention-economy-1.4225998>
- [16] Zhang, X., Pérez-Stable, E., Bourne, P., Peprah, E., Duru, O., Breen, N., ... Denny, J. (2017). Big Data Science: Opportunities and Challenges to Address Minority Health and Health Disparities in the 21st Century. *Ethnicity & Disease*, 27(2), 95-106.
- [17] Bozoglan, B. (2017). Psychological, social, and cultural aspects of Internet addiction (Advances in human and social aspects of technology). Hershey: IGI Global.
- [18] Jiang, B., Schmillen, R., & Sullivan, W. (2018). How to Waste a Break: Using Portable Electronic Devices Substantially Counteracts Attention Enhancement Effects of Green Spaces. *Environment and Behavior*, 1-28. doi:10.1177/0013916518788603
- [19] Meral, G. (2018). Is digital addiction a reason for obesity? *Annals of Medical Research*, 25(4), 472.
- [20] Johansson, A. (2018, July 25). We need to reduce our dependence on technology if we want to keep innovating. *The Next Web*. Retrieved from <https://thenextweb.com/contributors/2018/07/25/we-need-to-reduce-our-dependence-on-technology-if-we-want-to-keep-innovating/>
- [21] Gornall, J. (2017, July 21). Can the manipulation of big data change the way the world thinks? *The National*. Retrieved from <https://www.thenational.ae/opinion/can-the-manipulation-of-big-data-change-the-way-the-world-thinks-1.612012>
- [22] Anderson, J. (2017, August 30). The age of data monopolies. *Mawer*. Retrieved from <https://www.mawer.com/the-art-of-boring/blog/the-age-of-data-monopolies>
- [23] Hasselbalch, G., & Tranberg, P. (2017, May 19). Data Monopolies and Value Clashes. *DataEthics*. Retrieved from <https://dataethics.eu/data-monopolies-value-clashes/>
- [24] Haines, C. S., Lima, M. D., Li, N., Spinks, G., Foroughi, J., Madden, J., ... Baughman, R. (2014). Artificial muscles from fishing line and sewing thread. *Science*, 343(6173), 868-872.
- [25] Jacobs, J. (1961). *The death and life of great American cities*. New York: Random House.
- [26] Appleton, J. (1975). *The experience of landscape*. Hoboken: Wiley.
- [27] Bourassa, S. C. (1988). Toward a theory of landscape aesthetics. *Landscape and Urban Planning*, 15(3-4), 241-252.
- [28] National Aeronautics and Space Administration. *Global Climate Change: Vital Signs of the Planet*. Retrieved from <https://climate.nasa.gov/>