Action 11: Augment ‘Genius Loci’

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Why

‘Genius loci’ not only refers to a location’s distinctive atmosphere—the ‘spirit of the place’—but also the fundamental principle that design should always respond to the context in which it is located. While spirit and atmosphere were hard to quantify in the past, new digital tools and a proliferation of available data can now contribute to the assessment of the intangible and qualitative aspects of a site. The same is true for the sort of contextual information that can be derived automatically and systematically at much faster rates using digital and augmented tools.

What

Based on phenomenology and the analogue techniques that supported it, genius loci was, until recently, the result of subjective observation, interpretation and presentation of the qualities of site, locality and context. Due to this subjectivity, the term was marginalised within urban studies, despite the fact that contextual information informs urban analysis and design at the earliest stages. However, the principle of responding to site-specific aspects is seen as key to sensitive, adapted and sustainable urban design. Digital techniques can now be used to systematically and automatically augment analogue ways to interpret sites. This leads to what we call a ‘hybrid/hyper/cyber genius loci’.

How

In order to create this hybrid/hyper/cyber genius loci, we blend analogue and digital techniques, such as manually logging data, conducting analogue surveys and questionnaires, taking photographs and recording sounds and videos, and overlay these with crowd-sourced, remote-sensed, automatically collected and preprocessed data. In this way, capturing site data is not limited to predefined categories or rigid sample periods. Instead, the augmented hybrid/hyper/cyber genius loci concept allows us to blend data sets at any resolution and at any scale. Hybrid/hyper/cyber genius loci uses big data analytics to present the data in the form of dynamic maps, with the possibility of filtering and parsing spatial and temporal aspects. The augmented site analysis can then be recombined with reality using new technologies, such as virtual and augmented reality.

Evidence

in recreational areas, such as parks (43 per cent of travelled distance), and that a balanced distribution of residential and recreational land-use is a good predictor for the number of leisure walks and runs in an area.

At the network level, our team developed the 'Informed Design Platform' (You et al. 2019a; You et al. 2019b; Tunçer and You 2017; You and Tunçer 2016a; You and Tunçer 2016b) to support the upgrading of existing public spaces. It is a web platform that brings together and analyses big and small data about public space networks, integrating, analysing and visualising data from multiple sensor types, mobile phones, a space quality rating app, social media, and traditional surveys and workshops.

We also developed the 'Visit Potential Model' (Herthogs et al. 2018; Herthogs et al. 2019), a spatial interaction model for pedestrian networks that introduces network measures to estimate people's presence in public space, and the effect of public space qualities on this presence (see Figure 10.3); we used it to inform the design of public space networks in master-planning proposals (such as in the Waterfront Tanjong Pagar project, also in this publication).

Stakeholders

Stakeholder input has been a cornerstone of our evidence-informed approach to public space research and urban design support. We collected feedback directly (through workshops and experiments) and indirectly (through big data). For example, the 'Visit Potential Model' built on a model to predict visitor flows validated using mobile phone data (Schläpfer et al 2021). The 'Informed Design Platform' integrated both anonymised measured human data (e.g., location, direction, sound, footfall) and preference surveys (through a rating app and conventional community workshops). We derived characteristics of public spaces that encourage active leisure activities from people's running data (from *Strava* and *Endomondo*). Our work on pedestrian comfort integrated preferences surveys, Virtual Reality experiments, and pedestrian counting. Our MCDA framework for public space quality builds on collaborative expert workshops to rate and rank spatial qualities.

The strongest impact that we noticed when presenting our work is methodological. Through feedback, we have come to understand that our multimodal approach—combining 'novel' quantitative technologies (big data, AI, geospatial models), a sensitivity towards qualitative design methods, and captivating topics (public space, walkability, art)—strikes a chord with different kinds of audiences. As a result, over the last few years we have had many engaging collaborations with researchers, practitioners and policy makers, often acting as a bridging partner connecting quantitative and qualitative realms. Such engagements now drive the quality of our research findings and its dissemination.

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Augment 'Genius Loci'

Site, locality and context ground the research at Future Cities Laboratory (FCL) into the specific geographic, economic, cultural and climatic conditions of Singapore and South East Asia (Cairns and Tunas 2017; 2019). In that sense, most of FCL's research is responding to and informed by the context in which it is situated. Site-specific research also demands for appropriate and locally adapted tools. Those developed for the Global North are not necessarily adaptable without further improvement and modification for the location in the tropics.

During the first and second phases of FCL, researchers used and developed an array of analogue and digital tools that can be grouped into analytical, supporting, transforming and representational clusters, see *Indicia 02* (von Richthofen et al. 2019b; von Richthofen 2019). Interdisciplinary usage of both analogue and digital tools at FCL and the tracing of interlinkages can be analysed and interpreted using digital humanities techniques (Clavier and von Richthofen 2019; Costa and von Richthofen 2019).

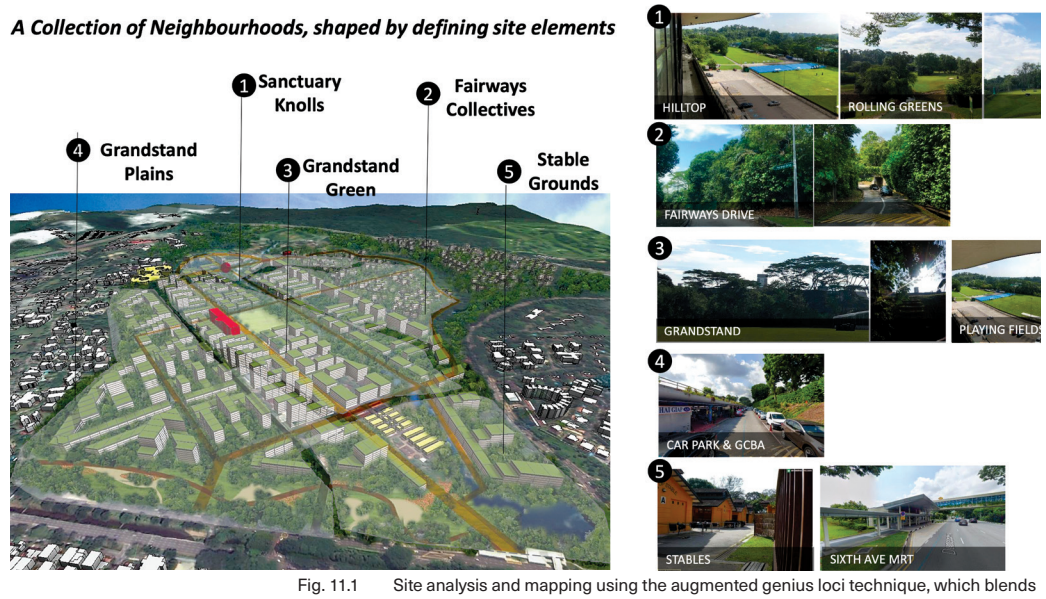

Fig. 11.1 Site analysis and mapping using the augmented genius loci technique, which blends analogue site observations with geo-referenced photos, photogrammetry, mapped satellite images, digital elevation models, procedural CityEngine models and 3D context models for the Turf Club in Singapore (Diagram by participants of the 2019 Advanced Studies in Urban Design course with URA and FCL).

Hybridisation of research methods and the repurposing of tools can be seen as a response to the necessity of site-specific tools. Contextuality and site specificity are also the underlying topics of the study of spatial use in cities by Tomarchio and Herthogs. The former analyses the use of cultural spaces in Singapore based on social media data (Tomarchio et al. 2016; von Richthofen et al. 2019a) while the latter developed a tool to assess the use of public spaces (Herthogs et al. 2018). Within their research group 'Big Data Informed Urban Design and Governance', they combined these methods to develop multicriteria decision and analysis frameworks (He et al. 2018). Contextual urban interpretation of data also leads to new forms of urban spatial representation, as shown in Figure 11.1—above and below ground—, and so-called digital twins (van Son et al. 2018; Gruen et al. 2019; Schrotter and Hürzeler 2020).

Fig. 11.2 Collection of geo-referenced photos, GPS and photogrammetry data using tablets at the Turf City site in Singapore, with participants of the 2019 AS-UD course with URA and FCL.

Fig. 11.3 Remote sensing and site data interpretation using digital geo-information tools and CityEngine in Singapore, with participants of the 2019 AS-UD course with URA and FCL.

Fig. 11.4 Experiencing the augmented hybrid/hyper/cyber genius loci with augmented reality goggles and an enriched digital urban twin model during the visit of Amt für Städtebau in Zürich, with participants of the 2019 AS-UD course with URA and FCL.

Stakeholders

The Advanced Studies in Urban Design (AS-UD) course, which was developed for the Urban Redevelopment Authority of Singapore (URA) and held for three years from 2017 to 2019, introduced various FCL research methods and findings to urban design officers (von Richthofen 2018). The way in which these materials are presented is tailored to the URA's pragmatic interest: How can this method be applied to the various urban design tasks? How can the research findings inform better urban design? Urban design projects necessarily start with an urban analysis generated by information gathered on the site, locality and context. The urban analysis critically references the canon of literature (see Further Reading). With the availability of hand-held connected devices such as tablets, smart phones and GPS recorders, participants could gather digital data while conducting the site visits, as shown in Figure 11.2. Here, conventional and digital methods started to blend into an augmented site analysis framework—the augmented hybrid/hyper/cyber genius loci, as shown in Figures 11.3 and 11.4.

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Create Variable Transport Flow

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Bundle Shared Rides

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