



## Citizen Design Sciences: bringing citizens' dimension into urban design

Urban design is an approach that usually involves experts' wisdom and experiences to construct smart, livable and resilient urban environments. We are researching how to **engage active public participation in urban design process**. Citizen design science is a complex science that exploits crowdsourcing data from citizens to make city **more responsive while contributing evidence-based approaches to urban design**. The project intends to **develop methodologies and applications for citizen participations in urban design** that bring together efficient data mining, the state-of-art machine learning and crowdsourcing methods, sensing and measuring techniques, powerful information visualization and human computer interaction design concepts. The aim of this research project is to investigate citizen design science and to extract citizens' wisdom that could transfer to urban design and planning process. The proposed research flows include:

1. **Citizen Design Science Foundations.** Basic research would be conducted to establish guidelines and methodologies for Citizen Design Science.

2. **Citizen Design Management.** Data would be collected through workshops, creative crowdsourcing platforms, and civic activities which incorporate human perceptions and understandings of urban forms and functions. Citizen design management promotes the idea of co-designed urban environments where every participant would be given appropriate tools to transfer their wisdoms into controlled forms.

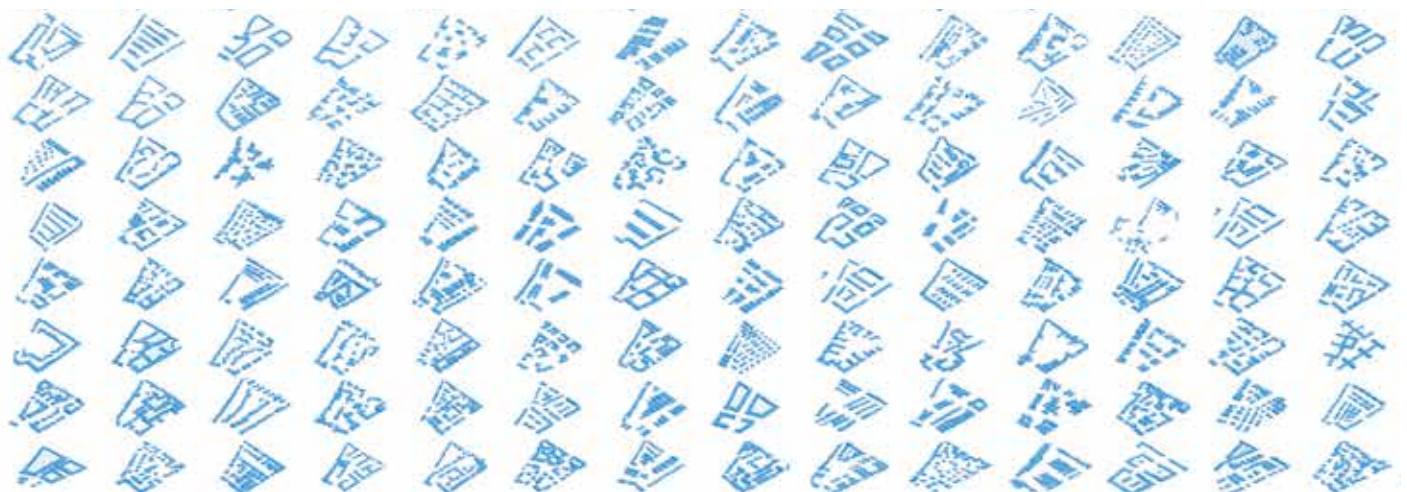
3. **Citizen Design Evaluation.** Evaluations would be conducted from two different dimensions, namely, computational and

human dimensions. Computational aspect refers to big data analysis to find out quantitative aspects of the urban forms and functions that align with citizens' preferences while human dimensions detect qualitative properties of citizens' design.

4. **Citizen Design Technology.** Possibilities to incorporate new technologies like virtual reality, argument reality and human brain interaction. By adopting new technologies, the perceptions aspects would be better analyzed and citizen experiences in designing actives could be enhanced.

Following the proposed work flows, the research would represent citizens' preferences in urban environments and raise public's awareness through participation. Qualitative and quantitative aspects of livable urban environments will be represented from citizens' dimensions, which will be transformed into urban design tools and strengthen evidence-based urban design processes. The research would pave the road to well-informed urban governance and be applied for policy- and decision-making.

The research is also part of Project Big-Data Informed Urban Design in Responsive Cities Scenario with the Future City Laboratory (FCL) in Singapore. By empowering citizens, both urban designers and governments could better construct living environments, which are more tailored to public preferences. This research runs in parallel to the MOOC (Massive Open Online Courses) Smart Cities course where thousands of students globally contribute to citizen design science through analysis and research on an array of thematics, for example the Empower Shack Project.



Design proposals from MOOC (Massive Open Online Course) Smart Cities.