

Statement of Objectives

Deploying Integrative Intelligent Systems towards Entrepreneurial Community Design

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The late two years witnessed the transformation of community innovation. Design practices have produced new prototypes of the entrepreneurial communities in Shanghai, Boston, and other high-performance cities. Diverse start-ups, labs, services, and entrepreneurs bring techniques, knowledge, and creativity into these communities to create synergetic connections and innovative interventions. However, as for community stakeholders, how to design equitable interventions requires scientific and efficient methods.

My research at City Science Lab @ Shanghai, a cooperation with MIT Media Lab, strives to develop an intelligent integrative system for evidence-based community design. The bottom-up system respectively: 1) leverages urban data analysis to understand conditions, 2) shapes tangible simulation interfaces to design sensible interventions, 3) establishes intelligent touchpoints to energize human interactions in the community.

The bottom module of the system is a network for data acquisition and analysis. Cloud-based hardware architecture aggregates multi-modal data captured from embedded sensors like Wi-Fi probes, HD cameras, and mobile apps. Cloud servers handle the data storage and cleaning to ensure that researchers can develop the computational analysis in a collaborative workflow. Algorithms quantify heterogeneous datasets and analyze characteristic patterns regarding places, pedestrians, and business. The analytics provide corroborative evidence for visualizing and simulating complex conditions in the target district before and after interventions. I have co-directed to establish such network at LivingLine Shanghai, a residential lane anchored with entrepreneurial labs and enterprises, for aggregating multi-modal datasets of entrepreneurs and residents and analyzing their urban interaction patterns via Deep Neural Network.

Next, I attempt to utilize CityScope, a tangible visualization and simulation tool, as the interface to engage community stakeholders in intervention design. City Science researchers from MIT Media Lab and global collaborators including City Science Lab @ Shanghai have been developing and deploying extensive CityScopes to simulate the impact of interventions in planned communities and expedite collaborative consensus among stakeholders. I work as a full-time researcher and liaison at City Science Lab @ Shanghai and have initiated CityScopes in collaboration with CityScopers from City Science Network for different scales of entrepreneurial communities such as Shenzhen Bay, Shanghai Siping community, LivingLine street, and Aalto campus. These CityScopes visualize business conditions of enterprises and behavioral patterns of entrepreneurs to help stakeholders recognize the issues and lacking resources in the district. With tangible interfaces, different stakeholders can proactively and intuitively sketch the design practices by manipulating Lego bricks for rapid scenario prototyping and testing. Real-time simulations can present multi-objective validations on the consequent performances of the community considering, for instance, the diversity, proximity, and sharability. People with

distinctive needs and goals can communicate and design suitable interventions to fix the insufficiency. It is, therefore, feasible to foresee how interventions can improve the situations and optimize the design before deploying entrepreneurial interventions.

Notwithstanding advisable planning, community building requires vibrant human interactions to energize the connections between spaces, people, and interventions. One of my research topics has explored the utilization of digital touchpoints to improve the human interactions in campus traffic service system. Digital touchpoints empowered by intelligent systems can serve such purpose by providing services to individuals in the community. I propose to research a slew of intelligent systems viable as touchpoints to meet the needs of service receptors and further galvanize them into co-creating values. Touchpoints surviving in the community can range from intelligent robots that act as efficient assistants for services like delivering, way-showing, and recording as well as social partners for relaxing, improvising, and exercising, to shared-use autonomous bikes for commuting from the workplace to social amenities. High-tech characters are expected to facilitate intimate communications among young entrepreneurs. The community curator can install intelligent systems in proper locations and scenarios to promote the vibrant entrepreneurial lifestyle.

The system utilizes various technologies to connect data, facts, humans, and design to create innovations for the community. This method is what I have experienced and distilled from my research and collaboration with researchers from Tongji University and MIT Media Lab. I cultivated a solid EE and HCI education background which empowers me to develop embedded and interactive systems. I took three years since graduation, setting up as a researcher and lecturer at the College of Design and Innovation, Tongji University, to look into new paradigms of how to use my interdisciplinary expertise and insights to create innovative values to both research fields and enterprises.

Communities are the emerging places with entrepreneurial transactions and diverse human interactions in smart cities. Though I found first chances to investigate explicit objectives, I am seeking exposure to novel technologies and brilliant collaborators to make it a complete deployment. MIT Media Lab is the inspiration for me to learn, invent and share, and an example of community that my work hopefully can help to bring about in new places.

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