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Thesis Proposal
Institute for Software Research
Computation, Organizations and Society

Utilizing the Urban Crowd to Enrich Computational Knowledge of Cities

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For decades, many successful applications have been engineered to incorporate factual knowledge about places, like the location-aware maps aboard our mobile phones that guide us to the places we need to go. However, a person's knowledge about a place is much more expressive than the view of the world often presented by today's applications. Humans develop local knowledge gradually over time through their many daily experiences with their city, its places, and its people. I call this *experiential local knowledge*. Distinct from factual local knowledge like the structure of a city's road network, which has an objective external reality, experiential local knowledge can also be perceptual and subjective, encompassing aspects of the environment that are difficult to know or understand a priori without actually experiencing them. Although this distinction is subtle, experiential local knowledge is critical to life in cities. It helps individuals make sense of the complexity of the city around them, and it facilitates coordination and natural interactions between groups of city dwellers who share common experiences.

In this dissertation proposal, I explore several important challenges and possibilities of building computing systems that utilize experiential local knowledge. Grounded in prior research in social geography, urban design, and social and cognitive psychology, I offer a definition of experiential local knowledge that captures the various complexities of how people know and interact with their environment. I then introduce several new techniques for gathering and modeling experiential local knowledge in cities through both direct observation using urban crowd-sourcing and through inference using machine learning based methods. In this way, this dissertation lays the groundwork for future applications that support more a deeper understanding of how the people experience their city.

The proposal document can be found at justincranshaw.com/thesis-proposal

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