Digitally Reflecting Our Space: Crowdsourcing Space Usage Rules

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Introduction

Space usage rules (SURs) – e.g. "no smoking", "no dogs" – play an important role in enforcing laws, protecting the environment, and maintaining public order. Prior work shows that while traditional paper maps often display space usage rules for the depicted area, this is not true in any popular online or mobile map [6]. This is partially because no large database of SURs currently exists [5]. Here we discuss ongoing work to generate such a database through large-scale crowdsourcing technology for mapping space usage rules.

Rules for Using Human Space

In our initial work, we are focusing on one complex and important space usage rule that has been the subject of heated discussion for over a decade: Minnesota's conceal-carry law, which allows anyone with a carry-permit to conceal their weapon. The "Minnesota Citizens Personal Protection Act" became law in 2003. After a legal battle, it was re-enacted in 2005, and remains in effect. While guns may be legally carried most places, the law specifies that private business owners may ban guns by posting signs at all building entrances that read "[OWNER OF BUSINESS] BANS GUNS IN THESE PREMISES" [7]. These signs are *in-situ* indicators of SURs.

Gathering Usage Rules

We are approaching the creation of a shared, digital understanding of SURs from the perspective of Priedhorsky et al. [4]: a crowdsourcing approach is effective when members of a community have information not known by, or shared with, the general public. We operationalize this concept through our mobile crowdsourcing platform *FolkSource*. FolkSource consists of an *overview and management* web application and a mobile app for *in-situ data submission*. In-situ members of a crowd understand rules for how they may use the space they occupy and have visual access to signs specifying space usage rules. With FolkSource, we are exploring how a mobile crowd can encode SURs into a digital, shared resource.

Ensuring Accurate Representation

Because SURs are often legally defined, incorrect crowdsourced data may lead to legal penalties, thus, the *cost of being incorrect* [2] is quite high. This raises critical system requirements related to mapping and communicating SURs in applications. Successfully communicating SURs poses technical challenges: **a)** How can a crowd define and confidently represent SURs? **b)** How do we distinguish "no submissions were made here" from "no businesses disallow guns here"? SUR-based applications also require that the dataset is correct. Thus, our research questions include: **1)** Can we motivate a mobile crowd to participate effectively? **2)** Does geographic bias [1,3] affect gathering ground truth? **3)** Are there enough "local power-users" to ensure good geographic coverage?

Conclusion

In this short submission, we have described ongoing research into the role of an *in-situ* crowd to encode and increase accessibility of usage rules in our shared spaces. We have discussed some challenges in pursuing this direction, and articulated our research agenda in this space.

References

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