F22.012: Encouraging Internet Measurement: Understanding Incentives and Barriers to Participating in Citizen Science Efforts for Internet Measurement

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Overview
Currently, government-subsidized broadband deployment efforts rely on provider-generated coverage maps, which use radio propagation models to demonstrate where mobile broadband is available across space. Ad hoc investigations of these maps have revealed that propagation models substantially overstate the penetration of ICT infrastructure and point to a need for widespread measurements of ICT infrastructure to better assess the true extent of coverage. As ICT infrastructure becomes increasingly necessary for essential services such as education, healthcare, banking, and civic participation, accurate assessment of ICT infrastructure accessibility becomes essential. To measure ICT infrastructure at scale and in a manner that illuminates inequities, it is necessary to rely on crowdsourced measurements of ICT infrastructure. This research seeks to answer two fundamental questions that drive ICT infrastructure policymaking and deployments: (1) How do we know that ICT infrastructure deployment efforts are actually improving access to ICT infrastructure? (2) How should crowdsourcing platforms for ICT measurements be designed in order to ensure that representative data is generated by crowdsourced ICT measurement efforts?

What the student will DO and LEARN
By interning on this project, students will: LEARN how to MINE DATA from social media and websites using APIs and web scraping technique LEARN how to CODE (LABEL) data as part of a thematic analysis ASSIST with interviews of Flagstaff residents about their perceptions about Internet measurement and crowdsourcing campaigns ASSIST in developing a web-based MapBook--a novel interactive interview tool for helping people discuss infrastructure and measurement LEARN how to MEASURE network performance using off-the-shelf tools used for crowdsourcing network measurements

Additional benefits
Students will be engaged in research that seeks to broaden participation in civic science that is aimed at community advocacy. The larger project that the student is helping with seeks to design a better network measurement platform that assists communities in organizing measurement campaigns. The design frameworks that are developed as a result will be used as part of a theory of design for creating inclusive tools for using citizen science to measure infrastructure.

Additional qualifications
The ideal candidate will have Python programming experience, either through a B or higher in CS126 and CS136 OR as demonstrated through a portfolio of software that they have developed using Python (e.g., a GitHub repository). The ideal candidate will also demonstrate strong verbal communication skills, particularly written communication skills.

Time commitment
6 hrs/week for 30 weeks