UNIVERSITY TRANSPORTATION CENTER

RESEARCH BRIEF

Combining Crowdsourcing and Machine Learning to Collect Sidewalk Accessibility Data at Scale

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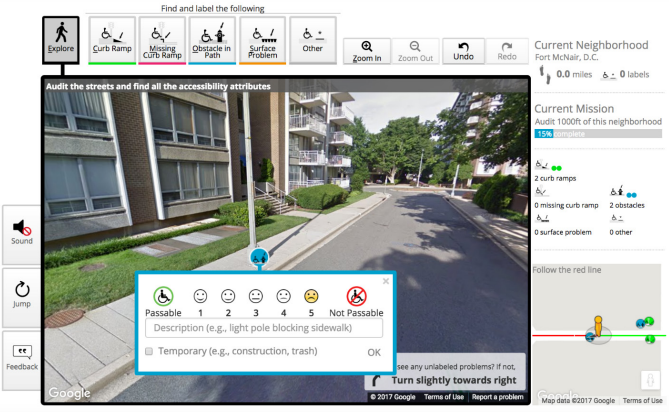
Background

Over 30 million US adults have a physical disability that impacts their ambulatory activity. Despite comprehensive civil rights legislation for Americans with disabilities, many city streets, sidewalks, and businesses in the US remain inaccessible. Traditionally, sidewalk assessment has been conducted via in-person street audits, which are labor intensive and costly, or via citizen call-in reports, which are done on a reactive basis. Recent online tools like Axsmap.com, Wheelmap.org, and AccessTogether.org aim to address some of these problems by collecting location-based accessibility information using smartphones. While these efforts are important, they focus on assessing the accessibility of a place rather than the accessible pathways to that place, and their value propositions are intrinsically tied to the amount and quality of data they collect. In contrast, we are developing new data collection approaches using a combination of remote crowdsourcing, machine learning, and online map imagery. Our overarching goal is to transform the way in which sidewalk accessibility information is collected and visualized to ultimately improve pedestrian infrastructure and how people move about a city. Our newest effort, called Project Sidewalk, enables online crowdworkers to remotely label pedestrian-related accessibility problems by virtually walking through city streets in Google Street View.



Research Project

Building on the above, we propose three threads of additional work:

- First, in the next year, we plan to deploy Project Sidewalk into three new cities, including two in the Pacific Northwest: Seattle, WA and Newberg, OR. These additional deployments will enable us to study new crowdsourcing workflows and user interfaces, new methods for inferring data quality, and to address questions about urban accessibility not previously possible.
- Second, to further scale our approach, we propose new methods to automatically identify and classify sidewalk problems using deep learning techniques, which are uniquely enabled by our large dataset.
- Finally, we propose new sidewalk accessibility models and interactive visualization tools to give stakeholders—from citizens to transit authorities—new understandings of their city's accessibility.

ABOUT THE AUTHORS

The research team consisted of Jon Freohlich of the University of Washington.

ABOUT THE FUNDERS

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EXPECTED DATE OF COMPLETION

August 2021

FOR MORE INFORMATION

http://depts.washington.edu/pactrans/research/projects/combining-crowdsourcing-and-machine-learning-to-collect-sidewalk-accessibility-data-at-scale/