

| UTC Project Information | |
|---|--|
| Project Title | Combining Crowdsourcing and Machine Learning to Collect Sidewalk Accessibility Data at Scale |
| University | University of Washington |
| Principal Investigator | Jon Froehlich |
| PI Contact Information | jonf@cs.washington.edu |
| Funding Source(s) and Amounts Provided (by each agency or organization) | University of Washington PacTrans \$50,000 University of Washington Computer Science & Engineering \$50,000 |
| Total Project Cost | \$ 100,000 |
| Agency ID or Contract Number | 69A3551747110 |
| Start and End Dates | September 16, 2019-September 15, 2021 |
| Brief Description of Research Project | <p>Sidewalks significantly impact the mobility and quality of life of millions of Americans. In the proposal, we described new, scalable methods for collecting data on sidewalk accessibility using machine learning, crowdsourcing, and online map imagery as well as new interactive visualizations aimed at providing novel insights into urban accessibility.</p> <p>As with our prior research, we will work closely with key stakeholders, including local governments and transit departments, mobility-impaired individuals and caretakers, and walkability advocates to help shape and evaluate the design of our tools.</p> <p>While our proposed techniques and tools should work anywhere with <i>OpenStreetMaps</i> and available streetscape imagery (e.g., <i>Google Street View</i>, <i>Mapillary</i>), two of our three immediate deployment targets are cities in the PacTrans region: Newberg, OR and Seattle, WA.</p> |

| | |
|---|---|
| <p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p> | <p>Building on our successful DC pilot and working with local and international partners, we have now deployed Project Sidewalk in seven additional cities, including large urban centers such as Seattle, WA and Pittsburgh, PA as well as more rural areas like Newberg, OR. The full list of active cities: Seattle, WA, Newberg, OR, Columbus, OH, Pittsburgh, PA, Mexico City, MX, and San Pedro Garza García, MX. In total, 6,600 users have labeled nearly 540,000 sidewalk accessibility problems across 10,000 km of city streets and provided over 171,000 label validations. To our knowledge, this is the largest open sidewalk accessibility dataset ever collected.</p> <p>Perhaps most excitedly, because Project Sidewalk provides a low-cost sidewalk auditing approach, we have been contacted by cities that otherwise lack resources to perform their own assessments. For our Mexican-based deployments, we have been working with Liga Peatonal—a Mexico-based NGO dedicated to safe and accessible pedestrian infrastructure. Working with LP and local Mexican governments, we have developed and released a Spanish version of Project Sidewalk in two pilot cities: Azcapotzalco in Mexico City and San Pedro Garza García. Thus far, over 1,400 users have mapped 1400 km of sidewalks and provided 106,000+ accessibility labels.</p> <p>Project Sidewalk’s labeling ontology is derived from accessible sidewalk standards like those from the US Access Board and includes five primary label types and 35 tags. The label types are <i>curb ramps</i>, <i>missing curb ramps</i>, <i>sidewalk obstacles</i>, <i>surface problems</i>, and <i>missing sidewalks</i>. Each label can contain a severity assessment (1-5 scale where 5 is an impassable barrier for a wheelchair user), an optional open-text description, and one or more label-specific tags. For example, <i>surface problems</i> can be tagged with eight additional descriptors, including <i>bumpy</i>, <i>cracks</i>, and <i>narrow</i>. All labels include additional metadata such as the image date, the labeling timestamp, validation information, and geo-location (lat/long).</p> |
|---|---|

| | |
|--|--|
| <p>Impacts/Benefits of Implementation (actual, or anticipated)</p> | <p>Our techniques and the collected data are making real-world impact. For example, our recently completed deployment in Newberg, OR resulted in 17,386 sidewalk accessibility labels from over 300 users (link), which was used to successfully advocate for and establish two new sidewalk repair programs by the Newberg City Council and the immediate authorization of \$50k for repairs on city property.</p> <p>The San Pedro government is using our data to understand inaccessible infrastructure, to examine correlates with pedestrian injuries and fatalities (in Mexico, over 44% of traffic-related deaths involve pedestrians), and to develop the municipality's new urban master plan with a focus on improved accessibility.</p> <p>As all Project Sidewalk data is open, others have created their own interactive sidewalk tools such as this one for DC by Barbera Moreno (https://bit.ly/SidewalksDC).</p> |
| <p>Web Links</p> <ul style="list-style-type: none">• Reports• Project Website | <p>The Project Sidewalk website is here: http://projectsidewalk.org/</p> |