

Project Information Form

Project Title:	Developing an Interactive Machine-Learning-based Approach for Sidewalk Digitalization
University:	University of California, Riverside
Principal Investigator:	Ji Luo Co-PI(s): Guoyuan Wu
PI Contact Information:	Email: jluo006@ucr.edu
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Total Project Cost:	\$25,000.00
Agency ID or Contract Number:	UCR-CT-TO-032.2 Caltrans 65A0527 Task Order 032.2
Start and End Dates:	November 21, 2016 – November 15, 2017
Brief Description of Research Project:	<p>In urban areas, many socio-economic concerns have been raised regarding fatal collisions, traffic congestion, and deteriorated air quality due to increased travel and logistic demands as well as the existing on-road transportation systems. As one of the promising remedies, active transportation has been advocated, which may not only mitigate congestion on local streets, but also promote physical fitness, foster community livability, and boost local economy. To promote the active transportation mode, extensive work has focused on planning and developing a number of pedestrian and bicyclist related programs which require the infrastructure, e.g., sidewalks, as a premise. A significant amount of these efforts go towards the setup, maintenance and evaluation of the sidewalk inventory on a relatively large geographic scale (e.g., citywide, statewide), which lays a solid foundation for a variety of active-mobility-focused applications and related research.</p> <p>Conventionally, transportation engineers and researchers have to rely on laborious field measurements to conduct sidewalk survey and assessment, which is rather resource consuming (in both time and cost). Recently, a few studies attempted to digitize sidewalks as a part of geographic information system (GIS), created the sidewalk inventory under restricted conditions, and assessed the quality of sidewalk. However, most of the existing methods for sidewalk system digitization are neither comprehensive nor cost-effective.</p> <p>This report proposes a machine-learning-based sidewalk digitization method which should be much more reliable and cost-effective than</p>



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	<p>other methods. The basic idea is to take full advantage of roadway networks to reconstruct an initialized (connected) sidewalk network. Then, an image sweeping script is developed to extract a large number of sidewalk images along the initialized sidewalk network. Third, a machine learning technique is applied to the aerial images of focused areas (i.e., surrounding zones along the initial sidewalk network) to identify whether a sidewalk is present or not.</p>
<p>Describe Implementation of Research Outcomes (or why not implemented):</p> <p>Place any photos here</p>	
<p>Impacts/Benefits of Implementation (actual, not anticipated):</p>	
<p>Web Links</p> <ul style="list-style-type: none">• Reports• Project website	<p>https://ncst.ucdavis.edu/project/developing-an-interactive-machine-learning-based-approach-for-sidewalk-digitalization/</p>