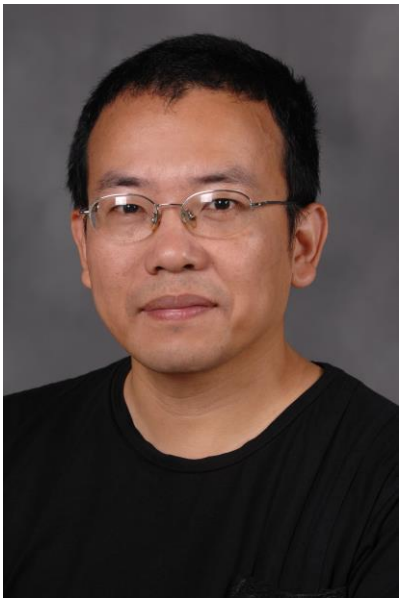
TEXAS A&M Institute of Data Science

Texas A&M Institute of Data Science Seminar Series

Sidewalk Extraction Using Aerial and Street View Images



A reliable, punctual, and spatially accurate dataset of sidewalks is vital for identifying where improvements can be made upon urban environment to enhance multi-modal accessibility, social cohesion, and residents' physical activity. During the COVID-19, delivery robots have been deployed in some communities to distribute food and medical supplies, in order to minimize the physical contact. However, such spatial planning and design need to be supported by the inventories of the existing sidewalk system, in order to facilitate the analytics of the use, connectivity, condition, adjacency, and accessibility of sidewalks. Yet, these inventories are not widely available in many cities. Our research develops a new spatial synthetically procedure to extract the sidewalk by integrating the detected results from aerial and street view imagery. We first train neural networks to extract sidewalks from aerial images, then use pre-trained models to restore occluded and missing sidewalks from street view images. Combining the results from both data sources, a complete network of sidewalks can be produced. Our case study includes four counties in the U.S., and both precision and recall reach about 0.9. The street view imagery helps restore the occluded sidewalks and largely enhances the sidewalk network's connectivity by linking 20% of dangles.

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Date: Friday, February 5, 2021
Time: 1:00 – 2:00 p.m. US Central Time
Zoom Meeting ID: 998 4499 3279
Passcode: 724615
Faculty host: Yu Ding, TAMIDS

Biography

Dr. Xinyue Ye is Associate Professor of Stellar Faculty Provost Investment Hire at Department of Landscape Architecture and Urban Planning in College of Architecture at TAMU, where he directs the Urban Data Science Lab. He also holds a courtesy appointment of Associate Professor of Geography in College of Geosciences. He served as a Visiting Professor at the Center for Geographical Analysis of Harvard University. With a career background in urban planning, geography, and computational science, his research focuses on geospatial artificial intelligence and urban informatics. He models the space-time perspective of socioeconomic inequality and human dynamics for applications in various domains, such as disaster response, economic development, public health, and transportation. He was the recipient of annual research awards from both computing (New Jersey Institute of Technology) and geography (Kent State University). His work has been funded by the National Science Foundation, National Institute of Justice, Department of Commerce, and Department of Energy. His recent two books on “Cities as Social and Spatial Networks” and “Spatial Synthesis: Computational Social Science and Humanities” prompt the human-centered research agenda of integrating urban science and computational science. His google scholar h-index ranks him #24 among the urban planning faculty in North America.

You can also click this link to join the seminar https://tamu.zoom.us/j/99844993279?pwd=TkJodWFVRURyMmkwakI4SWZGeVJTQT09

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