Collecting mobile LIDAR (light detection and ranging) data is becoming more common among state and county departments of transportation. It presents a means for collecting a great deal of high-accuracy information about the geometry of a road and its surrounding area at a lower cost than traditional surveying techniques. These methods yield a point cloud, or 3-D geometric representation, of the scanned area. Depending on the accuracy of the sensors used, the point cloud can be as accurate as 1 cm. Such systems enable a number of applications including surveying, construction, driver-assist systems, facilities inspection, inventory detection, asset management, and more.

Researchers in the Intelligent Vehicles Laboratory (IV Lab) at the University of Minnesota are currently working with a Velodyne HDL-64E LIDAR sensor that is capable of scanning 64 beams at once covering 360 degrees around the sensor to create a 3-D geometric representation of the area. This technology is most frequently associated with navigation and obstacle detection for autonomous vehicles. The work being done by the IV Lab focuses on the use of the sensor in stationary applications for collecting data at intersections. The goal of this effort is to investigate how well suited this system is for automatically collecting trajectory data for vehicles, bicycles, and pedestrians moving through intersections. This involves developing the...
algorithms and software to analyze the raw 3-D point cloud data that the sensor provides.

The expertise gained doing this work, along with previous LIDAR projects, will be collected and shared in workshops that will be developed for city and county traffic engineers who are interested in learning more about the tecUology and its traffic applications. This will include a classroom component discussing the state of the art in mobile LIDAR scanning as well as a lab component to show active LIDAR hardware collecting data. The goal of the workshops is to not only provide information about the current state of LIDAR but also to learn about the data needs of transportation officials in order to better identify new, useful applications of the tecUology.

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About the Intelligent Vehicles Laboratory
The Intelligent Vehicles Laboratory is located within the Department of Mechanical Engineering at the University of Minnesota. It is affiliated with the Roadway Safety Institute and the University of Minnesota’s Center for Transportation Studies. The lab focuses on developing and testing innovative, human-centered tecUologies that improve the operational safety, mobility, and productivity of vehicles. These tecUologies integrate sensors, embedded computing, machine learning and computer vision algorithms, and human–machine interfaces to create solutions that contribute to a safer and more effective transportation network.

www.ivlab.umn.edu

About the Roadway Safety Institute
The Roadway Safety Institute is the Region 5 University Transportation Center, led by the University of Minnesota. Other members are the University of Akron, the University of Illinois at Urbana-Champaign, Southern Illinois University Edwardsville, and Western Michigan University. Driven by the goal of preventing crashes to reduce fatalities and life-changing injuries, the Institute's activities focus on human-centered solutions to advance roadway safety.

www.roadwaysafety.umn.edu

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