

Leap Research Grant Award

NDSU FORWARD has named Dr. Ying Huang, Assistant Professor in the Department of Civil and Environmental Engineering, the recipient of a Leap Grant, with funding provided through ND EPSCoR. The \$30,000 seed grant will assist Dr. Huang's efforts to acquire external funding to further pursue her research in Intelligent Transportation Systems (ITS).



Leap research grants are intended to increase the retention and advancement of NDSU faculty, two core goals of FORWARD initiatives. These bridging grants are awarded to female faculty in STEM fields, and require submission of a research proposal to a funding agency within 12 months of the end of the award, as well as submission of at least one peer reviewed journal article during the award period.

Applications for the Leap research grant program were reviewed by external reviewers from other universities, which significantly influenced award selection. The number of awards was limited by the amount of funding available, resulting in difficult choices among the six applications for this round of the program.

Dr. Huang's project is entitled "Integrated Vehicle Identification System Using Low-cost Fiber Optic Infrastructure Sensor". With the United States as the world's largest market for passenger vehicles (estimated at 250.3 million registered passenger vehicles, with 10% annual growth) challenging the capability of the ground transportation network, there is a huge need for Intelligent Transportation Systems (ITS) which can evaluate roadway performance and improve the efficiency of existing systems. However, an ITS can be only as effective as the quality of the real-time traffic data that they depend on, which highly rely on the ability to accurately identify individual vehicles. In this project, the Dr. Huang is going to develop sensors for accurate vehicle identification using innovative in-pavement fiber optic sensor networks. With embedded sensors at key locations of an interested road section, it is expected to provide sufficient independent parameters for vehicle identification. This project will systematically

analyze the performance of the developed sensor and its implementation for vehicle identification through theoretic analysis and numerical simulations and provide validation of its effectiveness through laboratory and field tests.

Dr. Ying Huang received her Ph. D. degree in Missouri University of Science and Technology in 2012. In addition to her research in ITS, she also is interested in pipeline corrosion mitigation and assessment, smart structures and structural health monitoring, multi-hazard mitigation in harsh environments, and big data for transportation.