

DENSO Opens R&D Lab at University of Michigan in Ann Arbor to Advance Machine Learning and Automated Drive

JAN 10 | 2017

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SOUTHFIELD, Mich. – Global auto supplier DENSO today announced the opening of the DENSO R&D Lab at the University of Michigan in Ann Arbor to accelerate development of new auto safety technologies and create new research opportunities for engineering students.

The DENSO R&D Lab gives DENSO an opportunity to more closely collaborate with the University and North American automotive manufacturers on key safety technologies like machine learning, Advanced Driver Assistance Systems (ADAS) and Automated Drive (AD). As part of the lab, 12 university students have been selected to participate in research projects, which will begin this month and run throughout 2017.

“This new lab will provide opportunities for students to conduct research to develop future Automated Drive technologies that will help save lives,” said Doug Patton, Executive Vice President and Chief Technology Officer at DENSO’s North American headquarters in Southfield, Michigan. “We are excited to open the DENSO R&D Lab at the University of Michigan, in the heart of the global transportation technology research hub for autonomous drive right here in Michigan. The lab expands DENSO’s partnership with the University of Michigan, and extends a Master Alliance Agreement (MAA) we established in 2012 to sponsor multiple R&D projects.”

The DENSO R&D Lab is located at the University of Michigan’s North Campus Research Complex (NCRC), directly in the hub of research activity for AD that includes the Mobility Transformation Center (MTC) and its affiliated Mcity test facility, the University of Michigan

Transportation Research Institute (UMTRI), and the University of Michigan College of Engineering.

“As a member of the Mobility Transformation Center’s Leadership Circle and a sponsor of multiple research projects across campus, DENSO has been one of the University’s key industrial partners,” said S. Jack Hu, vice president for research at the University of Michigan. “Their new lab on campus will allow us work even more closely to create further opportunities for innovation and education.”

DENSO’s lab is a simulation environment with high-speed computing and high-capacity data storage. Simulation is conducted on high-performance computers and mechatronic systems, including an advanced driving simulator. Hardware-in-loop and driving simulators will provide researchers with functional verification of their methods for machine learning for AD and Collaborative AD (CoAD).

Machine learning for AD

Researchers will develop machine learning techniques to support AD systems in recognizing their environment, which helps them to make intelligent and sophisticated automated driving decisions.

Collaborative Automated Drive (CoAD)

By sharing sensor information via Dedicated Short Range Communication (DSRC), researchers will study ways to enhance the capabilities of automated driving for CoAD. This technique will increase the perception range of the system – beyond the field of view and line of sight of the on-board sensors.

Researchers will also test safety control algorithms such as forward collision warning, lane-keeping assistance, traffic sign recognition, V2X connected driving and pedestrian detection, among others.

In early December, **DENSO** also announced **MDrive**, a car sharing study in which University of Michigan-Dearborn students will help shape the future of mobility. With support from Detroit-based NextEnergy, an accelerator of advanced energy and mobility technologies, DENSO launched the study to determine what technologies may be needed for a new car-sharing segment. The students will provide feedback about car sharing and offer insights on helpful or unnecessary features in current car models.

About DENSO in North America

DENSO is a leading global automotive supplier of advanced technology, systems and components in the areas of thermal, powertrain control, electronics and information and safety. With its North American headquarters located in Southfield, Michigan, DENSO employs more than 23,000 people at 30 consolidated companies and affiliates across the North American region. Of these, 28 are manufacturing facilities located in the United States, Canada and Mexico. In the United States alone, DENSO employs more than 15,000 people in Alabama, Arkansas, California, Iowa, Georgia, Kentucky, Michigan, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee and Texas. DENSO's North American consolidated sales totaled US\$9.9 billion for the fiscal year ending March 31, 2016. For more information, go to www.densocorp-na.com. Connect with DENSO on Facebook at www.facebook.com/DENSOinNorthAmerica

DENSO Worldwide

DENSO Corp., headquartered in Kariya, Aichi prefecture, Japan has more than 200 subsidiaries and affiliates in 38 countries and regions (including Japan) and employs more than 150,000 people worldwide. Consolidated global sales for the fiscal year ending March 31, 2016, totaled US\$40.2 billion. Last fiscal year, DENSO spent 8.8 percent of its global consolidated sales on research and development. DENSO common stock is traded on the Tokyo and Nagoya stock exchanges. For more information, go to www.denso.com, or visit our media website at www.denso.com/global/en/news/media-center/

About DENSO's North American Aftermarket Group

DENSO's North American aftermarket group supplies parts for original equipment service dealers, independent aftermarket service centers and retailers. In addition, the company distributes heavy-duty diesel and electrical components, portable commercial air-conditioning units and industrial robots. The company employs approximately 500 people in Long Beach and Murrieta, California. The company's product line includes heavy-duty and automotive alternators, starters, oil, cabin and air filters, spark plugs, AC compressors, oxygen sensors, ignition wires, fuel pumps, fuel injectors and wiper blades. For more information, go to www.densoautoparts.com. Connect with DENSO Auto Parts on Facebook at <https://www.facebook.com/densoautoparts/>.

About the University of Michigan

Founded in 1817, the University of Michigan (U-M) is widely recognized as one of the world's leading research universities. The hallmark of the University is the breadth of excellence across its 19 schools and colleges and the exceptional degree of interdisciplinary cooperation among them. With \$1.4 billion dollars in research expenditures annually, and more than 100 top-ranked graduate and professional programs, the University of Michigan is a global leader in a wide range of disciplines spanning science and technology, health and medicine, law, public policy, and the arts and humanities.

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