

Canadian smarter-car research network established at McMaster University

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Federal Industry Minister for Canada, Tony Clement (left) and Tom Maibaum, professor of computing and software, McMaster University watch a vehicle avoidance demonstration at an event to announce a new national smarter-car software research network with GM Canada, IBM Canada, Malina Software, seven Canadian universities, and Centre de Recherche Informatique de Montreal. Credit: Ron Scheffler

A \$16.6-million national research network to tackle the technological challenges related to the growing complexity of automotive software systems will be led by McMaster researchers and located at McMaster Innovation Park. Network partners include Industry Canada, General Motors of Canada, IBM Canada, Malina Software Corp of Ottawa,

Centre de Recherche Informatique de Montréal, and six other Canadian universities.

The Network on Engineering Complex [Software](#) Intensive Systems for Automotive Systems (NECSIS) was announced today by Tony Clement, Minister of Industry, and Suzanne Fortier, president, Natural Sciences and Engineering Research Council of Canada (NSERC), at an event held at McMaster Innovation Park in Hamilton.

Also participating in the announcement were Kevin Williams, president and managing director of GM Canada; Bruce Ross, president, IBM Canada; Patrick Deane, president and vice-chancellor, McMaster University; and David Wilkinson, dean, Faculty of Engineering, McMaster University.

Automotive Partnership Canada, of which NSERC is the lead agency, is providing \$10.5 million in funding to the network over five years. Industry and academic partners are contributing \$6.1 million.

"Taking a leadership role in this new software engineering network expands McMaster's contributions to yet another growing area of automotive research, adding to our expertise in hybrid powertrains, material lightweighting, and advanced manufacturing," said Patrick Deane, president and vice-chancellor, McMaster University.

NECSIS is led by principal investigator Tom Maibaum, Canada Research Chair in the Foundations of Software Engineering at McMaster University, along with co-principal investigator Joanne Atlee, associate professor at the David R. Cheriton School of Computer Science at the University of Waterloo. Other universities in the network include McGill University, Queen's University, University of British Columbia, University of Toronto, and University of Victoria, as well as Centre de Recherche Informatique de Montréal.

"As a leading supporter of collaborative research in Canada, we have helped build a strong automotive innovation network," said Kevin Williams, president and managing director of GM of Canada. "NECSIS is a key initiative as we re-think the automobile and develop innovative approaches to develop tomorrow's technologies."

The network will be based in the new McMaster Automotive Resource Centre (MARC) being developed at McMaster Innovation Park. It is the same facility that will house research initiatives related to new hybrid powertrain and lightweight materials. MARC is being developed as an innovation ecosystem, promoting daily interactions among industry, university and government on market-oriented and industry-driven research.

"In an era where billions of devices are being interconnected to enable intelligent decisions, the time is right to create and to innovate development processes using real-time navigational capabilities that will help build a smarter car," said Bruce Ross, president, IBM Canada. "Together with our partners, IBM is proud to leverage our Canadian research capabilities to invest and to collaborate in this innovation effort as we collectively advance intelligent transportation in Canada."

NECSIS will focus on the advancement of an emerging methodology called model driven engineering (MDE). MDE reduces the complexity of developing software by focusing on models and their relationships, reflected in the designs, code and documents that developers work with, enabling them to test and verify models even before the code exists.

"Computer systems in vehicles are managing more and more operations and increasing in complexity," said Maibaum. "That adds up to tens of millions of lines of software code that must work flawlessly and seamlessly together, and achieving this is becoming increasingly challenging using current approaches to software development."

Functions managed by computer systems in today's vehicles include braking, stability, safety and fuel systems; systems to reduce emissions; and systems to protect, entertain and communicate with the driver. Hybrid and all-electric vehicles involve even more complex software based systems.

"Canada has long led the world in the highly advanced field of model driven engineering," said Bran Selic, president and founder of Malina Software Corp. "With decades long expertise in this field, we are extremely pleased and proud to have the opportunity to contribute to this important initiative."

Provided by McMaster University

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