



Small Tech Helps Drivers Navigate Big Cities

An electrical engineer at the Royal Military College is working with CMC Microsystems to address the ‘urban canyon effect’—when tall buildings or hills interfere with the Global Positioning System (GPS)

“CMC provides the workstation and the software for analyzing MEMS sensors, and brokers access to world-class manufacturing facilities. CMC also has expertise in MEMS and system-on-chip implementation—this knowledge is critical when trying to integrate different technologies.”

Dr. Aboelmagd Noureldin
Assistant Professor
Electrical and Computer Engineering
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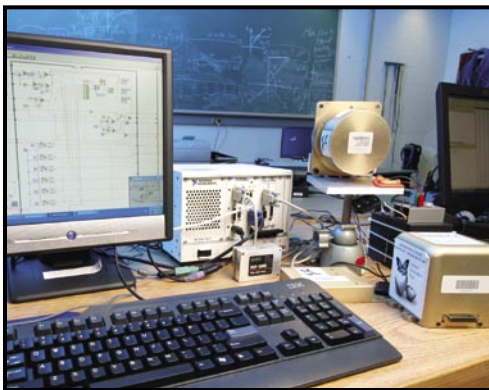


Dr. Aboelmagd Noureldin is bringing together MEMS and GPS technology to provide drivers with robust and reliable navigational information.

MEMS (microelectromechanical systems) technology promises to help drivers where the Global Positioning System (GPS) cannot: in large cities. Dr. Aboelmagd Noureldin is working with CMC Microsystems to develop a small, low-cost navigation system that combines MEMS sensors and a GPS receiver chip onto a single board to provide drivers with continuous navigational information.

“You can’t rely on GPS all the time, especially in downtown cores. Our solution augments GPS with MEMS-based sensors and fuses both with artificial intelligence techniques,” explains Dr. Noureldin, Assistant Professor at the Royal Military College in Kingston, Ontario.

This new vehicular navigation and guidance system—the first of its kind to be developed in Canada—combines measurements from MEMS-based inertial sensors and GPS in real-time to provide robust and reliable navigational information. A CMC-provided workstation with all the peripherals is essential to the project. The researcher will rely on access to the System-on-Chip Research Network managed by CMC to move the technology closer to commercial viability.



Dr. Noureldin relies on tools and technologies provided through the System-on-Chip Research Network managed by CMC to advance his research and move his navigation technology closer to commercialization.

In March 2005, researchers at RMC successfully tested the ability of their software to integrate the functionality inside land vehicles. The results have already been published in several scientific papers. It was also the thesis topic of one of Dr. Noureldin’s graduate students.

Dr. Noureldin is now focusing on the hardware. He plans to work with CMC to manufacture the MEMS sensors, which include accelerometers and gyroscopes. He hopes to complete a hardware prototype within the next two years.

Potential users of this technology include organizations in fleet management, emergency assistance, asset tracking, personnel location, environmental monitoring, defence and security.

Working together with CMC and private sector partners across Canada and the U.S., Dr. Noureldin’s research is boosting Canada’s global competitiveness in the markets for navigational products. *cmc*