

Monitoring the Environment with 'Intelligent Agents'

No—these aren't government or security agents; they are networks of robotic sensor agents that—with some critical help from CMC Microsystems—could provide new capabilities for monitoring toxic sites, war zones, deep space or even under water

"The products and services provided by CMC enable our team to develop prototype solutions for signal processing and sensing. Once this activity is complete, we will look at joining forces with other colleagues who have MEMS expertise and know how to implement the concept in silicon. We anticipate many opportunities to work with CMC through many phases of this project."

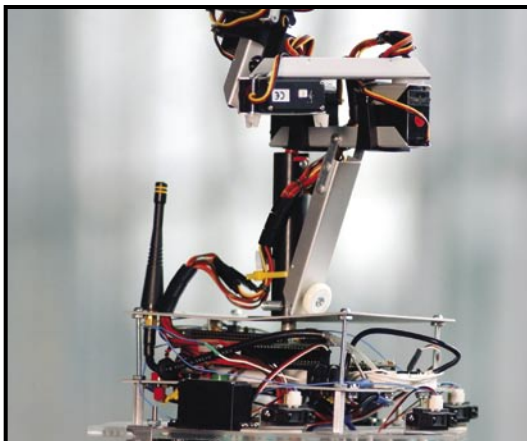
Dr. Emil Petriu
Professor

School of Information Technology and Engineering
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Dr. Emil Petriu demonstrates how the intelligent robotic sensor agent works to junior high-school students visiting the School of Information Technology and Engineering at the University of Ottawa.

Where humans dare not venture... this is exactly where Rami Abielmona hopes to send his latest creations. The doctoral student is using tools and technologies provided by CMC to develop network architecture that will enable hundreds or even thousands of intelligent robots to work together in hazardous or difficult-to-reach environments to measure temperature, smoke, radiation or the material properties of nearby objects.



An intelligent wireless robotic sensor agent with on-board robotic arm, video camera, and FPGA embedded controller. The technology was developed using tools and technologies provided by CMC Microsystems.

"We want to develop a generic solution where multiple robotic sensor agents cooperate to achieve a specific objective, such as locating a bomb, identifying hazardous material or decontaminating an area. The human operator could then view the data in a virtual reality environment and have command and control of the robotic society," explains Mr. Abielmona, who is being co-supervised by Dr. Emil Petriu and Dr. Voicu Groza, Professors at the University of Ottawa's School of Information Technology and Engineering.

The development of robotic sensor agents with these capabilities requires access to sophisticated tools provided through the System-on-Chip Research Network managed by CMC, including an FPGA (field-programmable gate array) logic chip to prototype solutions for signal processing and sensing.

The research project, initiated by Dr. Petriu in 1998, has already resulted in several published papers. An industrial partner, Larus Technologies Corp. of Ottawa, is interested in commercializing the technology. Mr. Abielmona is striving to put this technology to work with actual robots by next fall. The technology could improve ecological monitoring, remediation and interventions to help steward and sustain our natural resources, including the detection of pathogens in air and water to prevent tragedies such as E. coli outbreaks. *cmc*