



Tomorrow's technologies today: Plastic ultrasound among award-winning innovations highlighted at TEXPO 2018

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An innovative process for manufacturing ultrasound systems from plastic, quickly and at minimal cost, was among the winning technology prototypes demonstrated at CMC Microsystems' 2018 TEXPO Graduate Student Competition and Exposition. The "DIY ultrasound," developed by Carlos Gerardo, a PhD candidate in electrical and computer engineering at University of British Columbia, has applications in both medical and oil industries, and has already attracted interest from major companies.

TEXPO is a highlight of Innovation 360, Canada's largest annual gathering of micro-nano innovators from academia and industry, hosted this year by CMC Microsystems and NanoCanada. This year, 33 competitors from 15 postsecondary institutions across Canada's National Design Network presented their novel prototypes to judges from industry and academe.

"These prototypes are the foundations on which leading-edge products are built," says Gord Harling, President & CEO of CMC Microsystems. "But equally impressive are the highly skilled students who are the brains behind these technologies. These are truly exceptional individuals who represent the future of Canada's high-tech economy."

This year's award recipients are as follows:

Award for Excellence in Nanofabrication: Carlos Gerardo (University of British Columbia, supervisor Edmond Cretu), for "PolyCMUTs: Plastics Transducers for Ultrasound Imaging." Judges were impressed by his technology's industry readiness and breadth of applications, and described the work as "demonstrating unique and solid research."

Honorable mention: **Ehsan Espid** (University of British Columbia, supervisor Fariborz Taghipour), for "Design, Fabrication and Performance Evaluation of Photo-activated Micro Gas Sensors based on Semiconducting Nanostructures." His work was cited by judges for its "novel idea using UV light for increased sensitivity" and its adaptability for many different gases.

Brian L. Barge Microsystems Integration Award: M. Reza Pazhouhandeh (University of Toronto, supervisor Roman Genov), for "BRAIN: Bidirectional Rail-to-Rail Artifact-Insensitive Neural-interface." Judges praised Mr. Pazhouhandeh's technology for its "very high level of integration and innovation of multiple technologies with a clear commercialization path."

Honorable mention: **Hossam Shoman** (University of British Columbia, supervisor Lukas Chrostowski), for "High Quantum Efficiency Photo Conductive Heaters Enable Control of Large-Scale Silicon Photonic Ring Resonators Circuits." This work was noted by judges for "addressing key performance gaps on multiwavelength/channel applications."

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Industrial Collaboration Award: Zhongpan Wu and Karim Hammad (York University, supervisor Sebastian Magierowski), for “Hardware-Accelerated DNA Sequencing.” Judges praised the students’ energy- and cost-efficient hardware technology as “a fundamental step towards personalized medicine.”

Honorable mention: **Richard Cheng and Jean-Michel Gariepy** (University of Toronto, supervisor Axel Guenther), for “Microfluidic Device Enabled Handheld Bioprinter.” Their work was described by judges as “An excellent multi-tech integration toward enhancing wound healing.”

Micro-Nanosystems Design Award: Nahla Abouelkheir (University of Ottawa; supervisors Ralph Mason, Carleton University and Mustapha C.E. Yagoub, University of Ottawa), for “A 65nm Compact High-Performance Fully Synthesizable Clock Multiplier Based on an Injection Ring Oscillator.” Judges recognized her technology for its “clear advantages compared to other existing academic approaches.”

Established by CMC Microsystems in 1992, TEXPO offers graduate students across Canada’s National Design Network a unique opportunity to demonstrate their novel applications of microsystems technologies to industry representatives and academic peers. Projects are judged by academic and industry representatives, and each award offers a cash prize of up to \$3,500.

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