

Big data

UOIT-led Artemis Project wins Ingenious Award



TORONTO – University of Ontario Institute of Technology (UOIT)-led research aimed at reducing mortality rates in premature babies has been named a 2013 Ingenious Award winner by the Information Technology Association of Canada (ITAC). The award was presented to the Artemis Project (Using Big Data for Advanced Clinical Decision Support) research team headed by Dr. Carolyn McGregor (pictured), UOIT’s Canada Research Chair in Health Informatics, during a ceremony at the Allstream Centre at Exhibition Place in Toronto.

Artemis is a first-of-its-kind neonatal health informatics research project involving UOIT in Oshawa, Ontario; The Hospital for Sick Children (SickKids) in Toronto; IBM; and other research partners around the globe. Artemis applies a ‘big data’ approach to collecting, distributing and processing real-time physiological data at high speed and combines that with other clinical information to provide important clinical context.

Dr. McGregor’s diverse research team of neonatologists, emergency physicians, nursing staff, computer scientists and engineers has created a cloud-based platform capable of processing more than 1,200 physiological readings a second, per patient, across multiple patients in multiple locations. Artemis was one of 64 nominees chosen by ITAC nationwide across five categories. It won the Ingenious Award in the Not-for-Profit Sector.

“Artemis research is helping make sense of the constant stream of data collected from critically ill premature babies so doctors in the future will be able to better recognize subtle changes in a patient’s condition,” said Dr. McGregor. “The national recognition offered through the Ingenious Award is a testament of the hard work and dedication of our entire research team as we work to create innovative solutions for healthcare.”

“The 64 entries the Ingenious judges reviewed included some exceptional examples of how excellence and innovation in ICT can make significant changes in the way people work, access services, and communicate,” said ITAC President and CEO Karna Gupta. “The winners of the Ingenious Awards represent the best of what our sector is doing to improve business and life in Canada, and help build a leading digital economy.”

Premature birth is the leading cause of newborn death. Of the 15 million premature babies born around the world every year, almost 1.1 million will die (*) from relatively common

(*) this corresponds to 73 deaths per 1,000 born alive, the very bottom of the Infant Mortality chart when compared to those of indigenous peoples in the Amazon and of African people

ailments such as infection. Many of the infants who survive will end up permanently disabled. Although neonatal intensive care units have state-of-the-art equipment to monitor a baby's vital signs, the interpretation of all the data in a timely and meaningful fashion remains an ongoing challenge.

“As Artemis moves towards the clinical phase, Dr. McGregor's research will have far-reaching implications for neonatal intensive care units around the world,” said Dr. Michael Owen, UOIT Vice-President, Research, Innovation and International. “Her innovative research is exploring vital new ground in health care by combining big data with information and communications technology. We are very proud of her ongoing success with Artemis and her compelling work, which is drawing substantial international attention.”

Dr. McGregor believes Artemis holds the potential to be “the most positively disruptive influence on healthcare” since genome research was initiated a quarter century ago. “The standard procedure today for monitoring premature babies is for a nurse to go around every hour, record a baby's temperature and heartbeat, chart the data and then analyze it for any changes,” said Dr. McGregor. “With the development of Artemis, neonatal intensive care staff will have a new-found ability to remotely monitor complex physiological signals in real-time and to respond earlier to more subtle changes in a baby's vital signs.”

To date, Artemis has been used as part of new clinical research involving more than 1,000 premature patients at two North American hospitals and another in China. With its ongoing monitoring and measuring of multiple physiological streams, the system has demonstrated new earlier onset detection approaches to the common and highly dangerous infection known as Late Onset Neonatal Sepsis (LONS).

It has also demonstrated the ability to detect and eliminate false positives in the onset of LONS typically caused by narcotics or surgery. Two Artemis neonatologists have also presented new work on the analysis of the impact of blood transfusions in premature infants, based on the analysis of physiological data at the American Medical Informatics Association conference. Further details are to be published in a medical journal article in the coming months.

ITAC's Ingenious Awards program celebrates enterprises that demonstrate measurable evidence of productivity improvement, efficiency gains, revenue growth, overall business transformation or other organizational outcomes through the use of technology. Nominations come from across Canada and represent a broad cross-section of organizations in the private, public and not-for-profit sectors.

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