

## CESO 2018 Conference Program

January 30-31, 2018

The Hospital For Sick Children

Peter Gilgan Centre for Research and Learning - Main Auditorium + Room 2A/2B

686 Bay St (Corner of Bay & Elm)

Updated January 16, 2018



Clinical Engineering Society  
of Ontario

Tuesday, January 30

### Presentations

Time	Session #	Topic	Detail	Speakers & Bios
8:30 - 9:00			<b>Registration and Free Breakfast</b>	
9:00-9:05	Session 0 Auditorium	<b>Welcome and Opening Remarks</b>		Bill Gentles & Mario Ramirez
9:05-10:00	Session 1 Auditorium	<b>Keynote Address</b>	The use of "big data" to predict patient outcomes. There is a new trend for using all the measured physiological parameters obtained in an ICU bed. Through use of Big Data and some predictive analytics, clinicians are able to provide an up-to-date "score" on the current status of a patient. The score is then used to determine the patient status and "predict" whether early intervention is required to avoid a possible clinical deterioration of the patient. The presentation will be based on the Way a Clinician is using Big Data at SickKids to predict patient status to improve their care while in the Pediatric ICU.	Peter Laussen is Chief of the Department of Critical Care Medicine at the Hospital for Sick Children (SickKids), Professor in Anaesthesia at the University of Toronto and holds the David and Stacey Cynamon Chair in Critical Care Medicine. He is a Senior Associate Scientist at the Research Institute and chair of the Medical Advisory Committee at SickKids. Dr. Laussen has extensive experience with clinical research and educational activities in cardiac critical care and anaesthesia. Over the past decade he has focused on systems and human engineering applied to critical care, and the use of high and low frequency physiologic signals for predictive modelling in pediatric critical care; he is the lead developer of an innovative web-based data visualization platform called T3 (Tracking Trajectory Trigger tool). Dr Laussen is a co-founder in 2006 of the international "Risky Business" risk management, safety and quality conferences (www.risky-business.com) which brings together leaders in high-risk industries to discuss ways of improving the safety and quality of health care.
10:00-10:30			<b>Break</b>	
10:30-11:30	Session 2 Auditorium	<b>Big Data</b>	The purpose of this presentation is to provide a general overview of what Clinical Engineers/Biomedical Eng. Technologists need to know when interfacing medical devices to Electronic Health Records. We will attempt to have a middleware vendor come and provide some general guidelines that Biomedical Engineering personnel needs to be aware when attempting to interface medical devices to an electronic Health Record.  Processes are supported by IT systems everywhere. Whether this is a management information system to co-ordinate appointments and billing processes, or an X-ray machine that is used to examine a patient, all of these systems record digital traces about which activities were performed when. Process mining is a new data analysis technique that takes these digital footprints and automatically turns them into visualizations of the processes that took place. With the process mining tool, you can then analyze the variations of the process, the delays, and the deviations from the expected process flow. In this presentation, you will learn what process mining is and how it works. We will discuss what kind of data is needed to apply process mining and we will show you two concrete examples from the healthcare domain.	Coming soon  Anne Rozinat has more than 15 years of experience with process mining and obtained her PhD cum laude in the process mining group of Prof. Wil van der Aalst at the Technical University in Eindhoven, the Netherlands. Currently, she is a co-founder of Fluxicon, the makers of the popular process mining software Disco ( <a href="https://fluxicon.com/disco/">https://fluxicon.com/disco/</a> ) and organizers of the annual process mining conference Process Mining Camp ( <a href="http://processminingcamp.com">http://processminingcamp.com</a> ). Anne regularly blogs about process mining at <a href="http://fluxicon.com/blog/and">http://fluxicon.com/blog/and</a> and can be reached via email ( <a href="mailto:anne@fluxicon.com">anne@fluxicon.com</a> ) and Twitter (@arozinat).
11:30-1:30			<b>Lunch and Posters by Community College Students in Biomedical Engineering Technology Programs in the Gallery</b>	
1:30-2:45	Session 3 Auditorium	<b>UofT Clinical Engineering Student Presentations</b>	"Recent developments in healthcare technology" Each presentation will last 10 minutes, followed by 5 minutes for Q&A. These will be the 6 best papers from the pre-conference presentations that took place on January 30.	
		1:15	Presentation 1	Student 1
		1:30	Presentation 2	Student 2
		1:45	Presentation 3	Student 3
		2:00	Presentation 4	Student 4
		2:15	Presentation 5	Student 5
2:45 - 3:15			<b>Break</b>	
3:15 - 3:45	Session 4 Auditorium	<b>Equipment Technology</b>	Mariner's computer assisted surgery platform allows surgeons to annotate areas of risk during laparoscopic surgery. Our LaparoGuard software reconstructs "no-fly" zones based on surgeon annotations and overlays this information onto laparoscopic video feeds – augmenting the visualization. With the company's procedural kit, trackers are attached to conventional laparoscopic tools, and their positions in real-time are tracked throughout the procedure, warning the surgical team when instruments approach designated risk zones to prevent inadvertent injury and improving surgical workflow.	Mitch Wilson serves Mariner Endosurgery as a member of the senior management team. Working closely with laparoscopic surgeons and healthcare administrators to guide product development, Mitch leads the team in providing devices aimed to improve surgeons' workflows during minimally invasive general, gynecological and urological surgery, while aiding administrators with clinical performance metrics captured from Mariner's computer-assisted surgical devices. A native of Oshawa, ON, Mitch obtained his MBA from McMaster University, and graduated from McMaster (B.Sc) and Trent (B.Ed) previously. He, his wife Tori and their children live in Hamilton, ON. Founded in 2016, Mariner Endosurgery Inc. <a href="http://marinerendosurgery.com">http://marinerendosurgery.com</a> develops and commercializes innovative computer assisted medical devices for future-facing laparoscopic surgeries. Their platform LaparoGuard is a novel soft-tissue surgical navigation platform that augments visualization during laparoscopic surgeries, enhancing the safety profile of laparoscopic surgery to assist surgeons in delivering a superior quality of care to their patients
3:45 - 4:00	Session 5 Auditorium	<b>Day 1 Closing</b>	Door prizes	Bill Gentles & Mario Ramirez

### Parallel Technical Seminars

10:30-11:00	Parallel 1 Room 2A	Cybersecurity	Current state of medical device cyber vulnerability: OS & Anti Virus update, data encryption & transmission, Access Restriction. Mitigation strategies: RFP process, knowledge update, IT department involvement, inventorize risk, security control.	Jack Lam, P.Eng., is a Medical Equipment Information Technology Specialist in the Department of Medical Engineering at UHN. He has been supporting and developing medical equipment and software for 30 years. Some of his novel work includes electronics and software development in: signal & data interfacing, medical image capturing to PACS, and remote patient monitoring. Most recently, he has focused on medical device integration with IT systems.
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Wednesday, January 31

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8:30-9:00			<b>Registration and Free Breakfast</b>	
9:00-10:00	Session 6 Auditorium	Alarm Review Process	Default Alarm Settings Matter: A Case Study. At HHS, a pilot study was conducted to determine the effectiveness of adjusting default alarm settings in selected clinical units. A CQI-based iterative sequence was used to allowed fine-tuning of the alarm settings in order to achieve the required results. The goal was to reduce the numbers of non-actionable alarms produced. The process of obtaining stakeholder perception and acquisition of alarms data are also covered.	Mike Capuano, CBET/CCE, Manager, Biomedical Technology, Hamilton Health Sciences
10:00-10:30	Session 7 Auditorium	CESO AGM	Clinical Engineering Society of Ontario - Annual General Meeting	Bill Gentles, President, CESO
10:30-11:00			<b>Break</b>	
11:00-12:00	Session 8 Auditorium	International Issues	CESO Travel grant report: Report on a mission to Uganada	Jason Hearn is a graduate of Chemical Engineering at the University of New Brunswick and a Master of Health Science in Clinical Engineering candidate at the University of Toronto. Being raised in rural New Brunswick, Jason developed a strong passion for the provision of healthcare services in remote settings. Accordingly, the goal of Jason's Master's thesis is to harness the growing prevalence of mobile phones in low-income settings to empower heart failure patients to engage in better self-care. In developing a system that improves health education and patient-clinician interaction, Jason hopes to play a role in alleviating the immense burden that heart failure currently places on both patients and clinics in resource-limited settings.
			CESO Travel Grant report: Report on an Engineering World Health project in Rwanda	Zoe is a fourth year Biomedical Engineering (Co-op) student at the University of Guelph. She is passionate about thinking outside the box in order to improve quality of life. Her work terms have included material characterization for a biomedical device, and process engineering for the pharmaceutical industry. This year, she spent her summer volunteering alongside other biomedical engineering students from around the world with Engineering World Health in Rwanda. Supported by the 2017 CESO Travel Grant, she helped troubleshoot and repair medical equipment in hospitals, and experienced first hand the challenges of clinical engineering work in a low resource setting.
12:00-2:00			<b>Lunch and Vendor Exhibits in the Gallery</b>	
2:00-3:15	Session 9 Room 2A/2B	CESO Technical Problem Solving Challenge	CESO Technical Problem Solving Challenge	Biomedical Technologists compete for prize money by describing a technical challenge they solved using specific troubleshooting skills and techniques.
3:15-4:00	Session 10 Room 2A/2B	Advanced Perioperative Lab	The Advanced Perioperative Imaging Lab (APIL) specializes in the 3D modelling and 3D printing of patient-specific organs for medical education, pre-surgical planning, and basic medical research. Some of the lab's accomplishments include the development of a full-sized patient-specific heart with similar ultrasound properties of human tissue. This heart is being used as a teaching phantom to help residents familiarize themselves with the mechanics of transesophageal echocardiography. More recent projects have revolved around the use of augmented and virtual realities to supplement and complement the lab's 3D printed organs. Additionally, the lab serves as the 3D modelling and fabrication center for all pre-surgical planning models at TGH. Within the last year, APIL has manufactured 12 models for pre-surgical planning purposes for Interventional Cardiology, Cardiac Surgery, and ENT. A hospital-wide rollout of APIL's services is expected to start early 2018. APIL is headed by Principal Investigators Dr. Massimiliano Meineri and Dr. Azad Mashari both of whom are Cardiac Anesthesiologists at TGH's Department of Anesthesia and Pain Medicine. Day-to-day activities of the lab are managed by the lab's Biomedical Industrial Designer, Joshua Qua Hiansen. APIL collaborates with The Critical Making Lab in the Faculty of Information at The University of Toronto, The Faculty of Medicine at The University of Toronto, and several other research labs including The Peters' Lab at Western University. Lastly, the lab is funded by research grants from The University of Toronto and generous private donations from from Lynn and Arnold Irwin made through The Peter Munk Cardiac Foundation.	Joshua Qua Hiansen is the Biomedical Industrial Designer for the Advanced Perioperative Imaging Lab (APIL) at Toronto General. APIL specializes in the 3D modelling and 3D printing of patient-specific organs for medical education, pre-surgical planning, and basic medical research. Josh holds both an undergraduate and Master's degree in Human Physiology from Western University. Professionally, Josh manages the day-to-day activities of APIL and is the primary designer for several research and clinical projects at APIL. He specializes in both parametric and patient-specific 3D organ modelling and fabrication. In terms of manufacturing, Josh specializes in 3D printing with both FDM and SLA technologies and has knowledge of material properties appropriate for prototyping, functional design, and tissue acoustics. With regards to software, Josh is familiar with C# for Unity development and has developed several digital and augmented reality (AR) apps for medical education. These apps include a free, online transthoracic and transesophageal ultrasound simulator, and an educational heart viewer combining 3D printing and AR. When Josh is not at APIL, he also works as Nia Technologies' Research Manager. Nia Technologies is a not-for-profit technology start-up which develops hardware and software solutions for prosthetists and orthotists in the developing world to rapidly design and 3D print prosthetics and orthotics in the developing world.
4:00-4:15	Session 11 Room 2A/2B	Day 2 Closing	Closing remarks, door prizes	Bill Gentles & Mario Ramirez