

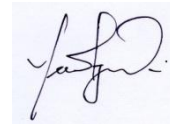
Welcome

The forth Symposium on Health Technology 2010 at the University of Waterloo is a unique experience that provides students and faculty members as well as people from industry with an opportunity to explore the rapidly changing field of health technology. Today's symposium will consist of various technical presentations and a graduate student poster session.

The six technical presentations will give experts from different fields of bioengineering a chance to speak about their experiences, research, and/or products. This year's speakers represent a carefully chosen cross-section of the broad field of bioengineering, both from research and industry. For a short biography of each presenter please see the following pages of this booklet.

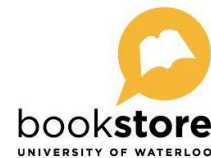
To showcase leading edge research currently being done at the university, graduate students will be presenting their research projects in an informal poster session. Attendees can broaden their knowledge of the scope of bioengineering, learn more about recent advances in specific areas, and meet face-to-face with the minds that made those advances possible.

We hope you have an enjoyable and insightful experience at this year's symposium!



John Yeow

Faculty Advisor of the club



Agenda

- 8:30-9:00 Registration, and Refreshment
9:00-9:20 Opening Remarks
Dean Adel Sedra, Dean of Engineering, University of Waterloo
- 9:20-9:30 Event Overview
Dr. John Yeow, Associate Professor, System Design Engineering, University of Waterloo
- 9:30-10:30 Keynote Talk, Brain-Machine Interfaces for Accurate Monitoring and Subsequent Treatment of Central Neural System Functions
Dr. Mohamad Sawn
- 10:30-11:15 Development of polymeric nanomaterials for cancer therapy
Dr. Frank Gu
- 11:15-12:00 Scanning probe microscopy in biomedical research
Dr. Zoya Leonenko
-
- 12:00-13:30 Lunch & Poster Viewing
-
- 13:30-14:30 Keynote Talk, Composition imaging using coherent scatter computed tomography for targeted management of kidney stone disease
Dr. Ian Cunningham
- 14:30-15:15 The never-ending quest to understand biomaterial-cell interactions
Dr. Maud Gorbet
- 15:15-15:30 Break & Refreshment
- 15:30-16:15 Blackberry Solution - The Centerpiece of mHealth Reality
Dr. Sasan Adibi
- 16:15-16:45 Poster Awards and Closing Remarks
Dr. John Yeow

Speakers

Prof. Mohamad Sawan



Polytechnique Montréal

Montreal, Canada

<http://www.polymtl.ca/recherche/rc/en/professeurs/details.php?NoProf=108>

Talk

"Brain-Machine Interfaces for Accurate Monitoring and Subsequent Treatment of Central Neural System Functions"

Mohamad Sawan was born in Lebanon, received the Ph.D. degree in 1990 in electrical engineering, from Sherbrooke University, Canada. He joined Polytechnique Montréal in 1991, where he is currently a Professor of Microelectronics and Biomedical Engineering. His scientific interests are the design and test of mixed-signal (analog, digital, RF, MEMS and optic) circuits and Microsystems: design, integration, assembly and validations. These topics are oriented toward the biomedical and telecommunications applications. Dr. Sawan is a holder of a Canada Research Chair in Smart Medical Devices. He is leading the Microsystems Strategic Alliance of Quebec (ReSMiQ) receiving membership support from 11 Universities.

He is founder / co-founder of several International conferences such as NEWCAS, BiOCAS, and ICECS, and he is Editor/ Associate Editor of several International Journals such as the IEEE Transactions on Biomedical Circuits and Systems and the Springer Mixed-signal Letters. He is the founder of the Polystim Neurotechnologies Laboratory at Polytechnique Montréal. Dr. Sawan published more than 450 papers in peer reviewed journals and conference proceedings, offered more than 90 invited talks/keynotes, and he was awarded 6 patents pertaining to the field of biomedical sensors and actuators.

Dr. Sawan received several prestigious awards; the most important of them are the Medal of Honor from the President of Lebanon, the Bombardier Award for technology transfer, the Barbara Turnbull Award for medical research in Canada, and the achievement Award from the American University of Science and Technology. Dr. Sawan is Fellow of the IEEE, Fellow of the Canadian Academy of Engineering, Fellow of the Engineering Institute of Canada, and Officer of the Quebec's National Order.

Prof. Ian Cunningham



Dr. Ian Cunningham is a professor and scientist at the Robarts Research Institute at The University of Western Ontario and physicist at London Health Sciences Centre. He directs a research team of graduate students and post-doctoral fellows that are investigating new ways of acquiring and displaying medical images using digital radiography and computed tomography for improved health care.

Robarts Research Center

London, ON, Canada

<http://www.robarts.ca/ian-cunningham>

"Composition imaging using coherent scatter computed tomography for targeted management of kidney stone disease"

Dr. Frank Gu



Dr. Frank Gu received his Ph.D. at Queen's University in Canada, where he majored in chemical engineering and was awarded with Canada Graduate Scholarship from Canadian Natural Sciences and Engineering Research Council (NSERC). In 2006, he was awarded with NSERC Postdoctoral Fellowship to join the Laboratory of Institute Professor Robert Langer lab at Massachusetts Institute of Technology (MIT). In July 2008, Frank joined the Department of Chemical Engineering at the University of Waterloo. His current research interests are in the development of biomaterials for nanomedicine and biopharmaceutics applications.

University of Waterloo

<http://nanomedicine.uwaterloo.ca/>

"Development of polymeric nanomaterials for cancer therapy"

Dr. ZOYA LEONENKO



Associate Professor
Department of Physics and
Astronomy
Department of Biology
Waterloo Institute for
Nanotechnology

<http://www.leonenkoresearch.uwaterloo.ca/>

**" Scanning probe microscopy in
biomedical research "**

Dr. Leonenko's holds a joint position of Associate Professor in the Department of Physics and Astronomy and the Department of Biology at the University of Waterloo. She is also a member of Waterloo Institute for Nanotechnology and a collaborative member of Nanosciences Center at the University of Burgundy in Dijon, France. She received her PhD in Chemical Physics, in 1996, from Russian Academy of Sciences, Novosibirsk, Russia, and did her postdoctoral training in biophysics at University of Calgary, Canada. Dr. Leonenko is leading Biophysics research group at the University of Waterloo, Canada. Her current research interests include scanning probe microscopy and biophysics of lipid membrane and lipid-protein interactions, the role of structural changes and physical properties of lipid template in controlling biological processes and diseases, application of lipid films in biomedical nanotechnology. Current projects include the study of structure and function of lung surfactant; amyloid fibril formation and toxicity in relation to Alzheimer's disease; interaction of nanoparticles with lipid and cell membrane, and development of applications of lipid films in biomedical nanotechnology. Leonenko's group uses advanced optical, fluorescence and scanning probe microscopy methods, such as atomic force microscopy (AFM), electrostatic force microscopy (EFM), magnetic force microscopy (MFM) and Kelvin probe force microscopy (FM-KPFM) and works on the development of novel methods and applications of these methods in biophysics and biomedical nanotechnology. Dr. Leonenko has more than 60 publications in leading international journals, such as Nanomedicine, Biophysical Journal, Biomedical nanotechnology, Biophysica et Biochimica Acta, Langmuir, and presented multiple invited talks in Canada and internationally. She is a member of Material Research Society, American Physical Society, American Biophysical Society, and Canadian Association of Physicists.

Dr. Maud Gorbet



University of Waterloo

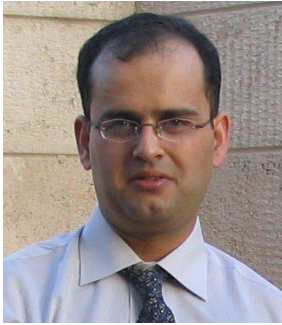
Waterloo, ON, Canada

<http://www.systems.uwaterloo.ca/people/faculty/gorbet.html>

"The never-ending quest to understand biomaterial-cell interactions"

Dr. Maud Gorbet is a faculty member within the Systems Design Engineering Department at University of Waterloo. She is also cross appointed to the School of Optometry. Her research and expertise focus on understanding interactions between biological systems and biomaterials. She is well recognized in the blood biocompatibility research area and her review on biomaterial-associated thrombosis was selected as one of the 25 most significant papers in the 25 years of publication of the journal Biomaterials. While relatively new to the field of ophthalmic materials, she has already made important contributions. Her post doctoral research on cell interactions with contact lenses was an invited presentation at the biennial meeting of the International Society for Contact Lens Research (the “think tank” of contact lens research and industry) in 2007. Her approach to biocompatibility problems and knowledge of cell-material interactions has led Dr. Gorbet to design new in vitro models or modify existing ones to better reproduce the in vivo situation and allow for a more complete assessment of the biocompatibility of materials. While working in industry, she played a significant role in characterizing the biocompatibility of a novel polymer to allow its entry into clinical trials, gaining valuable experience as project coordinator of biocompatibility studies in collaborative research projects with university and industry partners. She is also a very active member of the Community Outreach Program at University of Waterloo, through her enthusiastic involvement as local team coordinator for the First Lego League Ontario. This program encourages engineering creativity amongst local students aged 9 through 14 by giving them the opportunity to create teams that tackle an engineering problem and create a Lego robotic structure that is able to complete a set of tasks in a timely fashion.

Dr. Sasan Adibi



Sasan Adibi (BS'95, MS'99, MS'05, PhD'10) has a PhD degree in Communication and Information Systems and is currently involved in the design and implementation of the next generation wireless and mobile applications in the health-care industry. He has an extensive research background mostly in the areas of Quality of Service (QoS) and Security. He is the first author of +30 journal/conference/book chapter/white paper publications and is a co-editor of two books in the areas of 4th Generation Mobile Networks and QoS. He also has strong industry experiences, having worked in a number of high-tech companies, including: Nortel Networks and Siemens Canada. He is currently a Member of Technical Staff at Research In Motion (RIM), Canada.

Research In Motion

Waterloo, ON, Canada

Talk

**“Blackberry Solution - The
Centerpiece of mHealth Reality”**

Posters

Poster Presenter	Title
Nikhil Kumar	Thermal drying of wastewater solids
Daniel Bacinello	Laser-Triggered Drug Release From Smart Polymeric Nanospheres Containing Gold Nanorods
Mehrdad Gangeh	A Texton-Based Approach for the Classification of Lung Parenchyma in CT Images
Atif Khan	Electronic Patient Consent Management
Samaneh Shadmehr	Nanofluidics in Carbon Nanotubes
Kanwarjeet Kaur	Structure and function of immunoglobulins adsorbed onto gold nanoparticles
Mike Gallamore	Radiation Therapy Quality Assurance at Stronach Regional Cancer Centre
Shahed Shahir	Test-bed for Electromagnetic Image Tomography System
Fatima Nasser	Collection, Detection and Differentiation of Single-Walled Carbon Nanotubes using <i>T. thermophilla</i>
Herbert Tang	Effects of Fluctuations in Development and Disease
Fatemeh Dorri	Missing Value Imputation in DNA Microarrays Based on Conjugate Gradient Method
Madjid Soltani	Numerical Modeling of Drug Delivery to Solid Tumor
Negar Rasti	Developing Multi-Scales Roughness on the Surface of Metals via Nanosecond Pulsed Laser Processing for Improving Their Osseointegration Properties

Organized By

We would like to thank all the organizers for all the hard work they have put in, this symposium would not have been possible without you guys!

Dr. John Yeow
Negar Rasti
Shahed Shahir
Mihaela Vlasea
Amir Fazeli

Madjid Soltani
Parisa Sadatmousavi
Yaser Shanjani
Sarah Mayer
Jean Nassar

Special thanks to Judges,

Dr. Medly
Dr. Hamidreza Alemohammad

Dr. Kohandel
Dr. Chandrashekar

Faculty members,

Dr. Adel sedra
Chris Pringle

Dr. Sivaloganathan

and last but not least our volunteers:

Nasim Bakhshizadeh
Saman Mohammadi
Sherry Towfighian

Neda Darivandi
Fut Yang
Mehrdad Irvani

Notes
