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| **Roman Genov** | | | | | | | |
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| The Edward S. Rogers Sr.  Department of Electrical and Computer Engineering  10 King's College Road  Toronto, Ontario M5S 3G4 Canada | | | | | *URL*: http://www.eecg.utoronto.ca/~roman  *Email*: roman@eecg.utoronto.ca  *Phone*: (416) 946-8666  *Fax*: (416) 971-2286 | | |
| RESEARCH INTERESTS | | | | | | | |
|  | Analog integrated circuits and systems for energy-constrained biological, medical, and consumer sensory applications, such as implantable, wearable and disposable sensory microsystems, sensory-edge machine learning accelerators and wireless sensors; applications include brain-chip interfaces, neuro-stimulators, computational image sensors, and molecular biosensors. | | | | | | |
| EDUCATION | | | | | | | |
|  | **The Johns Hopkins University**, Ph.D., Electrical and Computer Engineering,Baltimore, MD, 8/2002.  Dissertation: Massively Parallel Mixed-Signal VLSI Kernel Machines.  Advisor: Gert Cauwenberghs  **Massachusetts Institute of Technology**, Visiting Student, Cambridge, MA, 1/1999-8/1999.  Artificial Intelligence Lab / Center for Biological and Computational Leaning.  **The Johns Hopkins University**, M.S.E., Electrical and Computer Engineering, Baltimore, MD, 1998.  **Rochester Institute of Technology**, B.S., Electrical Engineering, Rochester,NY, 1996. | | | | | | |
| ACADEMIC AND INDUSTRIAL POSITIONS | | | | | | | |
|  | **University of Toronto,** Toronto, ON, 7/2014-Present.  *Professor*, Department of Electrical and Computer Engineering.  Electronics Group and Biomedical Engineering Group.  **University of Toronto,** Toronto, ON, 7/2008-6/2014.  *Associate Professor*, Department of Electrical and Computer Engineering.  Electronics Group and Biomedical Engineering Group.  **University of Toronto,** Toronto, ON, 9/2002-6/2008.  *Assistant Professor*, Department of Electrical and Computer Engineering.  Electronics Group and Biomedical Engineering Group.  **The Johns Hopkins University**, Baltimore, MD, 9/96-8/2002.  *Research Assistant*, Department of Electrical and Computer Engineering.  Adaptive Microsystems Laboratory.  **Swiss Federal Institute of Technology (EPFL)**, Lausanne, Switzerland, 6/1998-7/1998.  *Visiting Researcher*, Autonomous Systems Lab.  **Xerox Corporation**, Webster, NY,3/1996-8/1996.  *Design Engineer CO-OP*, Advanced Development Team in the Color Imaging Systems Division.  **Atmel Corporation**, Columbia, MD, 6/1995-12/1995.  *Design Engineer Intern*, Chesapeake Design Center. | | | | | | |
| AWARDS AND HONORS | | | | | | | |
|  | **International**  Best Poster Award, International Conference on Computational Photography, ICCP, (with K. Kutulakos, 95 accepted posters), 2021.  Jack Kilby Award for Outstanding Student Paper, IEEE International Solid-State Circuits Conference, ISSCC (with H. Kassiri, the highest ranked student paper), 2018.  Best Paper Award, IEEE Transactions on Biomedical Circuits and Systems, TBioCAS (with R. Shulyzki, the top paper, one paper is selected among all published papers over two years, USD $2000 prize), 2017.  Best Paper Award, IEEE International Symposium on Circuits and Systems, ISCAS (with H. Kassiri, the top paper, selected by IEEE Biomedical Circuits and Systems Technical Committee, 1687 submitted papers conference-wide), 2016.  Best Paper Award, IEEE Biomedical Circuits and Systems Conference, BioCAS (with H. Jafari, the best paper overall, 199 submitted papers), 2011.  AMD/CICC Student Award at IEEE Custom Integrated Circuits Conference, CICC (with M. Nazari, $200 prize, one of the highest ranked student papers, 305 submitted papers), 2010.  Best Student Paper Award nomination at IEEE Biomedical Circuits and Systems Conference, BioCAS (with K. Abdelhalim, top seven student papers, 126 submitted papers), 2010.  Best Student Paper Award, IEEE International Symposium on Circuits and Systems, ISCAS (with A. Nilchi, $400 prize, one of the two best student papers, 1631 submitted papers), 2009.  Best Paper Award, IEEE International Symposium on Circuits and Systems, ISCAS (with A. Nilchi, the top paper, selected by IEEE Sensory Systems Technical Committee, 1631 submitted papers conference-wide), 2009.  Best Student Paper Contest Finalist, IEEE International Symposium on Circuits and Systems (with F. Shahrokhi, top nine student papers out of 783 regular papers), ISCAS 2009.  **National**  Award for Excellence in Microsystems CAD Tools and Design Methodology, the winner of CMC TEXPO National Student Research Annual Competition in 2022 (with R. Silva, $3,000 prize).  RBC Prize for Innovation & Entrepreneurship, 1st Prize Early-Stage Competition in 2021 (with G. O’Leary, T. Valiante, $10,000 prize).  GlobalFoundries Micro-Nanosystems Design Award, the winner of CMC TEXPO National Student Research Annual Competition in 2021 (with R. Gulve, $3,000 prize).  Brian L. Barge Award for Excellence in Microsystems Integration, the winner of CMC TEXPO National Student Research Annual Competition in 2008 (with H. Jafari, $3,500 prize), in 2012 (with H. Kassiri and N. Soltani, $3,500 prize), and in 2018 (with R. Pazhouhandeh, $3,500 prize).  Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Accelerator Award (awarded to top Canadian research programs superior in originality and innovation; up to 125 awards are offered nation-wide in all NSERC disciplines, $120,000), 2017.  1st Rank in Collaborative Health Research Projects competition by Canadian Institutes of Health Research (scored first among 116 submitted proposals), 2016.  The MEMSCAP Microsystems Design Award, the winner of CMC TEXPO National Student Research Annual Competition (with A. Bagheri and S. Gabran, $3,000 prize), 2012.  DALSA Corporation Award for Excellence in Microsystems Innovation, the winner of a CMC TEXPO National Student Research Annual Competition (with A. Olyaei, $3,000 prize), 2006 and (with K. Abdelhalim, $3,000 prize) 2009.  Canadian Institutes of Health Research (CIHR) BioContact Next Generation Award (with M. Derchansky, $2,000 prize), 2005.  **Provincial / Local**  Connaught Innovation Award (for the development of promising technology) ($75,000; $50,000; $50,000, $75,000), 2016, 2019, 2021 and 2022.  Photonics Innovation Centre Award (For a Best Multidisciplinary Project in the Field of Photonics, won by PhD student R. Gulve, $10,000 prize), 2020.  Analog Devices Outstanding Student Designer Award (For Excellence in Analog, Mixed-Signal, Digital IC Design, or System-Level IC Architectures, won by PhD student M. ElAnsary, $1,500 prize), 2018.  Ontario Neurotech Entrepreneurs Award (for AI-powered software to help physicians more accurately and efficiently identify seizure-producing brain regions, with D. Groppe and T. Valiante, $50,000), 2017.  Ontario Brain Institute Entrepreneur Award (for neurotechnology with high commercialization potential, with H. Kassiri, N. Soltani, $50,000), 2015.  Heffernan/Co-Steel Innovation Commercialization Fellowship (for research with high commercialization potential, with H. Kassiri, N. Soltani, $34,000), 2015.  **Teaching**  Departmental Teaching Award, as voted by undergraduate students, Department of Electrical and Computer Engineering, University of Toronto (top four professors in the department, by popular student vote), 2015.  Undergraduate Teaching Award for teaching excellence, University of Toronto Students Union (five awards across the university), 2008-2009. | | | | | | |
| RESEARCH GRANTS AND CONTRACTS Annual Total | | | | | | | |
|  | | | | | | | |
|  | “Personalized Contingent Neurostimulation for Epilepsy by Machine Learning in Organic Brain Interfaces,” PI, Canadian Institutes of Health Research (CIHR) and Natural Sciences and Engineering Council of Canada (NSERC), Collaborative Health Research Projects, 4/2020-3/2023.  “Closed-loop Artificially Intelligent Fiber-selective Peripheral Nerve Interface for Neuroprosthetic Applications,” CARTE Seed Project Funding, 4/2020-3/2022.  “CenteR for Advancing Neurotechnological Innovation to Application (CRANIA),” co-PI, Canadian Foundation for Innovation ($6.5M), 2018-2023.  “Programmable Camera Systems for Transport-Aware Imaging,” co-PI, NSERC Research Tools and Instruments, 4/2018-3/2019.  “Heterogeneous Integration of High-Density Analog Crossbar for Advanced Data Processing,” co-PI, Natural Sciences and Engineering Council of Canada (NSERC), Strategic Projects, 10/2017-09/2020.  “Artificially Intelligent Neurostimulators for Drug-Resistant Epilepsy,” PI, Canadian Institutes of Health Research (CIHR), Project Grant, 4/2017-3/2022.  “Transport-Aware Image Sensors,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Discovery Award, 05/2017-04/2022.  “Wireless Neurophotonic Probes for the Interrogation of Neurons in Memory Circuits,” co-PI, Canadian Institutes of Health Research (CIHR) and Natural Sciences and Engineering Council of Canada (NSERC), Collaborative Health Research Projects, 4/2017-3/2020.  “A Clinical Study of Seizure-Aborting Implantable Neuro-stimulation Efficacy in Treating Drug-Resistant Epilepsy,” PI, University of Toronto EMHSeed Award, 1/2017-12/2018.  “Artificially Intelligent Neurostimulators for Drug-Resistant Epilepsy,” PI, Canadian Institutes of Health Research (CIHR), Project Grant, Bridge Funding, 9/2016-9/2017.  “Patient-Specific Adaptive Closed-Loop Neurostimulation for Optimum Treatment of Intractable Epilepsy,” PI, Canadian Institutes of Health Research (CIHR) and Natural Sciences and Engineering Council of Canada (NSERC), Collaborative Health Research Projects, 4/2016-3/2019.  “Computational and Optical Processing Architectures for Next-Generation Mobile Cameras,” co-PI, Natural Sciences and Engineering Council of Canada (NSERC), Strategic Projects, 10/2014-09/2017.  “Validation of Monitoring Changes in Brain Synchrony to Anticipate Seizures and Implement Feedback Stimulation to Stop Seizure Occurrence,” Co-I, Ontario Brain Institute, 3/2011-4/2013.  “Fully Implantable Wireless Multi-Electrode ECoG Monitoring Systems,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Collaborative Health Research Projects, 4/2012-3/2015.  “Research Instruments for Experimental Characterization of Wireless Biomedical Sensory Microsystems,” PI, NSERC Research Tools and Instruments, 4/2012-3/2013.  “Electronic Microsystems for Ubiquitous Biomedical Sensing,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Discovery Award, 05/2012-04/2017.  “A Low-cost, Compact Spectral Imaging Microsystem for Rapid, Regenerative and Highly Selective Nucleic Acid Detection,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Strategic Projects, 10/2010-09/2013.  “Micromachined Electrodes and Integrated Circuits for Implantable Cortical Brain Interfaces,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Strategic Projects, 10/2009-09/2012.  Short-term contract, PI, Industrial Partner, 2/2008-3/2008.  “Electro-Optical Microsystem for DNA Detection,” PI, Ontario Centres of Excellence, Centre for Photonics, 1/2008-9/2008.  “2-D Integrated Microsystem for Neural Recording and Stimulation in the Brain,” peer-reviewed Hybrid Integration project, PI, Canadian Microelectronics Corporation, 12/2007-9/2008.  “Integrated Neural Interfaces for Epileptic Seizure Monitoring“, Co-I, subcontract from Prof. P. Carlen, University Health Network, University of Toronto, 9/2006-8/2008.  “Hybrid Integration Technologies for Optical DNA Detection,” peer-reviewed Hybrid Integration project, PI, Canadian Microelectronics Corporation, 1/2008-12/2008.  “Smart Sensory Microsystems,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Discovery Award, 05/2007-04/2012.  NSERC Industrial Postgraduate Scholarship (recipient: M.A.Sc. student Farzaneh Shahrokhi), Medtrode Corporation, 9/2006-8/2008.  “Hybrid Integration Technologies for Brain-Chip Interfaces,” Hybrid Integration project, PI, Canadian Microelectronics Corporation, 2006.  Infrastructure Operating Fund Award, PI, Canada Foundation for Innovation (CFI), 4/2006-3/2010.  “Intelligent Sensory Integrated Systems,” PI, New Opportunities Award, Canada Foundation for Innovation (CFI), 11/2005-3/2008.  “Intelligent Sensory Integrated Systems,” PI, Ontario Research Fund, 11/2005-3/2008.  “Real-time Human Gate Recognition for Automated Surveillance,” Co-I with D. Hatzinakos, K. Plataniotis, and P. Klentrou, Communications and Information Technology Ontario (CITO), 6/2004-5/2006.  “Autonomous Integrated Vision Systems,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Discovery Award, 05/2003-04/2007.  “Mixed-Signal VLSI Circuits and Systems,” PI, Connaught Foundation, 10/2002.  “Mixed-Signal VLSI Circuits and Systems,” PI, University of Toronto, ECE Dept., 10/2002. | | | | | $250,000  $60,000  $208,000  $148,509  $127,200  $220,000  $58,000  $62,000  $30,000  $100,000  $77,400  $50,500  $20,000  $60,833  $145,545  $21,750  $75,150  $78,240  $10,000  $30,000  ­  $8,000  $13,250  $14,000  $22,500  $6,000  $5,000  $7,517  $33,408  $33,408  $17,225  $20,850  $10,000  $100,000 | $750,000  $120,000  $1,041,000  $148,509  $636,000  $1,100,000  $290,000  $186,000  $60,000  $100,000  $232,200  $151,500  $40,000  $182,500  $145,545  $108,750  $225,450  $234,720  $10,000  $30,000  ­  $8,000  $26,500  $14,000  $112,500  $12,000  $5,000  $30,068  $100,226  $100,226  $34,450  $83,400  $10,000  $100,000 |
| CURRENT GRADUATE / POST-GRADUATE RESEARCH ADVISEES | | | | | | | |
|  | **Post-Doctoral Fellows / Scientists**  None  **PhD Students**  Rahul Gulve, 9/2017-current.  Nafiseh Ghoroghchian, 9/2017-current (co-supervised with Prof. Draper, 50%).  Jose Sales Filho, 5/2018-current.  Jianxiong (Jay) Xu, 9/2018-current.  Roberto Rangel, 9/2019-current.  Mohammad Abdolrazzaghi, 9/2020-current (co-supervised with Prof. Eleftheriades, 50%).  Sudip Nag, 1/2021-current.  Mustafa Kanchwala, 9/2021-current.  Ayandev Barman, 9/2021-current.  Yu Huang, 4/2022-current.  **MASc Students**  Liam Long, 7/2018-current (co-supervised with Profs. T. Valiante and P. Yoo).  Don Nguyen, 9/2019-current.  Xiaonong (Frank) Sun, 5/2022-current.  **MEng Project Students**  Sanjana Seerala, 5/2021- current.  Sheng Zhao, 1/2022-current.  Nicholas Popowich, 1/2022-current.  Eiley Tarlton, 5/2022-current. | | | | | | |
| FORMER GRADUATE RESEARCH ADVISEES | | | | | | | |
|  | **Former Post-Doctoral Fellows**  Tariq Salam (PhD, Ecole Polytechnique, Montreal), Post-Doctoral Fellow, 03/2012-01/2015 (co-supervised with Profs. Perez Velazquez and Carlen, 50%).  Project: Seizure Anticipation and Closed-Loop Abortion in Rodent Models of Epilepsy  Upon completion: Vice-President of Technology at Avertus, Toronto  Currently: Bioelectronics R&D Engineer at GlaxoSmithKline, Stevenage, UK  Hyunjoong Lee (PhD, Seoul National University, South Korea), Post-Doctoral Fellow, 09/2014-01/2016 (co-supervised with Prof. Kutulakos, 50%).  Project: CMOS Structured-Light Computational Imagers  Upon completion: Electronics and Telecommunications Research Institute, South Korea  Enver Kilinc (PhD, EPFL, Switzerland), Post-Doctoral Fellow, 03/2015-02/2016 (co-supervised with Prof. Gulak, 50%).  Project: Implantable Transceiver and Antenna Design  Upon completion: Post-Doctoral Fellow, University of Toronto  Currently: Co-founder/CTO Co-founder, Micromensio, Toronto  Nikola Katic (PhD, EPFL, Switzerland), Post-Doctoral Fellow, 04/2016-06/2017 (co-supervised with Prof. Kutulakos, 50%).  Project: Transport-aware Image Sensors  Upon completion: Senior Analog Design Engineer at Synopsys, Toronto  Currently: Senior Analog Design Engineer, Intel, Toronto  Xuan-Thuan Nguyen (PhD, University of Electro-Communications, Japan), Post-Doctoral Fellow, 3/2018-2/2019.  Project: Digital Accelerators of Machine Learning Algorithms for Closed-loop Neurostimulation  Upon completion: Digital Designer at Tradetone Research Labs , Toronto  David Groppe (PhD, UCSD, USA) Post-Doctoral Fellow / Research Scientist, 09/2016-09/2019 (co-supervised with Prof. T. Valiante, 50%).  Project: Machine Learning Algorithms for Closed-loop Neurostimulation  Upon completion: Clinical Data Scientist at Persyst Development Corporation, Toronto  Zhengfan Xia (PhD, Tohoku University, Japan), Post-Doctoral Fellow, 10/2017-10/2019 (co-supervised with Prof. R. Kutulakos, 50%).  Project: Digital Systems for Computational Photography Cameras  Upon completion: Digital Designer at Tradetone Research Labs , Toronto  Amirali Amirsoleimani (PhD, University of Windsor, Canada), Post-Doctoral Fellow, 2/2018-06/2021.  Project: Monolithic CMOS-Memristor Integrated Systems  Upon completion: Assistant Professor at York University, Toronto  **Former PhD Students**  Karim Abdelhalim, Ph.D. Degree, 09/2007-01/2013.  Thesis: Wireless Neural Recording and Stimulation SoCs for Monitoring and Treatment of  Intractable Epilepsy  Upon graduation: IC Design Engineer at Broadcom Inc, Irvine, CA  Currently: Senior Staff Engineer at Inphi, Orange County, CA  Derek Ho, Ph.D. Degree, 09/2007-01/2013 (co-supervised with Prof. G. Gulak).  Thesis: CMOS Imager Design Optimizations for DNA Fluorescence Biosensing  Upon graduation: Associate Professor, Department of Physics, City University of Hong Kong  Hamed Jafari, Ph.D. Degree, 09/2007-05/2013.  Thesis: CMOS Universal Real-time Label-free DNA Analysis System-on-chip  Upon graduation: IC Design Engineer at Semtech/Snowbush, Toronto, Ontario  Currently: CTO and Co-Founder at EnviroSen, Toronto  Hossein Kassiri, Ph.D. Degree, 02/2011-12/2015.  Thesis: Multi-Modal Densely-Integrated Closed-Loop Neurostimulators for Monitoring and  Treatment of Neurological Disorders  Upon graduation: Assistant Professor, Department of Electrical Engineering and Computer Science, York University, Toronto  Nima Soltani, Ph.D. Degree, 09/2011-12/2015.  Thesis: Inductively-Powered Implantable Integrated Circuits for Amperometric Brain Chemistry  Upon graduation: Analog and Mixed-Signal Design Engineer at Synopsis, Toronto  Currently: Analog and Mixed-Signal Design Engineer at Intel, Toronto  Maged ElAnsary, Ph.D. Degree, 9/2015-12/2019.  Thesis: Multi-modal Fully-wireless SoCs for Interfacing with the Nervous System  Upon graduation: Analog and Mixed-Signal Design Engineer at Rambus, Toronto  Reza Pazhouhandeh, 9/2015-11/2019.  Thesis: BRAINI: Bidirectional Rail-to-Rail Artifact-Immune Neural-Interface  Upon graduation: Analog and Mixed-Signal Design Engineer at AnalogX, Toronto  Navid Sarhangnejad, 9/2014-3/2021.  Thesis: Per-Pixel Coded-Exposure CMOS Image Sensors  Upon graduation: Analog IC Design Engineer at Huawei, Toronto  Gerard O’Leary, 9/2017-2/2022.  Thesis: Closed-Loop Neuroelectronic Interfaces: In Vitro to Silicon to Clinical Translation  Upon graduation: NerveX, CEO, Toronto  **Former MASc Students**  Ashkan Olyaei, M.A.Sc. Degree, 09/2003-04/2006.  Thesis: ViPro: Focal-Plane CMOS Spatially-Oversampling Computational Image Sensor  Upon graduation: Staff Manager / Senior Staff RF-Analog Design Engineer at Marvell Semiconductor, San Jose, CA  Rafal Karakiewicz, M.A.Sc. Degree, 09/2003-08/2006.  Thesis: Mixed-Signal VLSI Adiabatic Array Computing  Upon graduation: Analog IC Design Engineer at Synopsis, Snowbush, Toronto  Currently: Analog IC Design Manager at Intel, Toronto, ON  Joseph Aziz, M.A.Sc. Degree, 09/2004-10/2006 (co-supervised with Prof. B. Bardakjian).  Thesis: Multi-Channel Signal-Processing Integrated Neural Interfaces  Upon graduation: Analog IC Design Engineer at Broadcom, Textronix, Inphi  Currently: Touch ASIC Architect at Apple, Cupertino, CA  Alireza Nilchi, M.A.Sc. Degree, 09/2005-11/2007.  Thesis: Focal-Plane CMOS Algorithmically-Multiplying Computational Image Sensor  Upon graduation: Analog IC Design Engineer at Intel, Toronto  Currently: Senior Staff Scientist at Broadcom, Irvine, CA  Meisam Nazari, M.A.Sc. Degree, 01/2006-06/2008.  Thesis: CMOS Wide-Dynamic-Range High-Throughput Potentiostat  Upon graduation: PhD student at California Institute of Technology  Currently: Postdoctoral Fellow at California Institute of Technology  Ritu Raj Singh, M.A.Sc. Degree, 09/2006-11/2008.  Thesis: Luminescence Contact Imaging Microsystems  Upon graduation: PhD student at University of Texas, Austin  Currently: Senior IC Design Engineer at InSilixa, Sunnyvale, CA  Farzaneh Shahrokhi, M.A.Sc. Degree, 09/2006-01/2009.  Thesis: Multi-Channel Fully Differential Digital Integrated Neural Recording and Stimulation Interfaces  Upon graduation: IC Design Engineer at Synaptics Inc, Santa Clara, CA  Ruslana Shulyzki, M.A.Sc. Degree, 09/2006-09/2009.  Thesis: Bidirectional Integrated Neural Interface for Adaptive Cortical Stimulation  Upon graduation: IC Design Engineer at Ignis Innovation Inc, Waterloo, Ontario  Currently: Analog IC Design Engineer at Intel, Toronto  Arezu Bagheri, M.A.Sc. Degree, 09/2010-09/2013.  Thesis: High-Integration-Density Neural Interfaces for High-Spatial-Resolution Intracranial  EEG Monitoring  Upon graduation: IC Design Engineer at Semtech/Snowbush, Toronto, Ontario  Currently: Senior Analog Mixed-Signal Design Engineer at Peregrine Semiconductor, San Diego  Arshya Feyzi, M.A.Sc. Degree, 09/2011-10/2014. (co-supervised with Prof. G. Gulak).  Thesis: A CMOS Multi-Modal Contact-Imaging Scanning Microscope  Upon graduation: IC Design Engineer at Analog Devices, Boston, MA  Wilfred Cho, M.A.Sc. Degree, 09/2015-10/2017.  Thesis: Proxy Relearning for Feature-Driven Pattern Recognition in High-Dimensional Imbalanced Time Series Data Sets  Upon graduation: Machine Learning Engineer at Evolv Technologies  Gerard O’Leary, M.A.Sc. Degree, 09/2015-01/2018.  Thesis: Intelligent Medical Devices for Brain State Classification and Responsive Neuromodulation  Upon graduation: PhD student at the University of Toronto  Gairik Dutta, M.A.Sc. Degree, 7/2016-1/2019.  Thesis: Column-Parallel 7μm-pitch 2nd-order ∆Σ ADCs for Computational Image Sensors  Upon graduation: IC Design Engineer at Rambus, Toronto  Nikita Gusev, M.A.Sc. Degree, 9/2017-9/2019.  Thesis: System-Level Design of Coded-Exposure Cameras for Computational Imaging Applications  Upon graduation: Design Engineer at Alphawave, Toronto  Camilo Tejeiro, M.A.Sc. Degree, 1/2018-4/2020.  Thesis: Low-power Edge-combining Ring-oscillator-based RF Transmitters for Flexible-electrode Neural Microimplants  Upon graduation: IC Design Engineer at Synopsys, Toronto  Saima Ali, 9/2017-9/2020 (co-supervised with Prof. M. Popovic).  Thesis: Design of a Wireless Communication System for Neural Implants  Upon graduation: PhD student, University of Toronto  Jamie Koerner, M.A.Sc. Degree, 9/2018-10/2020 (co-supervised with Prof. T. Valiante).  Thesis: Machine Learning-Driven Patient-Specific Early Seizure Detection for Neuromodulation Devices  Upon graduation: PhD student, Massachusetts Institute of Technology  Motasem Sakr, M.A.Sc. Degree, 9/2019-9/2021.  Thesis: Hardware-Efficient Accelerators for Mask Generation in Coded-Exposure Cameras  Upon graduation: IC Design Engineer at NVIDIA, Toronto  **Former MEng Students**  Yu Hu, M.Eng. Degree, 5/2014-8/2014.  Project: High-Voltage Neural Stimulator with Adaptive Loading Consideration  Atul Patridar, M.Eng. Degree, 5/2014 -8/2014.  Project: Wireless Radio Connectivity for Responsive Neuro-Stimulation Implants  Jiaming Liu, M.Eng. Degree, 5/2014-8/2014.  Project: Wirelessly Powering for Responsive Neuro-Stimulation Implants  Aditi Chemparathy, M.Eng. Degree, 10/2013-12/2014.  Project: Low-Latency Sleep Stage Classifier  Kevin Lee, M.Eng. Degree, 05/2015-09/2015.  Project: High-Speed I/O Design for Pixel Programmable CMOS Image Sensor  Hardik Patel, M.Eng. Degree, 05/2015-12/2015.  Project: Optoelectronic Testing Platform for 3D Image Sensors Characterization  Asish Abraham, M.Eng. Degree, 04/2016-05/2017.  Project: ASIC Implementation of a Low-Power Microcontroller for Implantable Biomedical System Control  Goutham Palaniappan, M.Eng. Degree, 04/2016-08/2017.  Project: Wireless Powering Systems for Neural Implants  Veronica Li, M.Eng. Degree, 12/2016-08/2017.  Project: Low-noise Microelectronic Interface for Brain-Monitoring Microelectrode Arrays  Naba Siddiqui, M.Eng. Degree, 01/2017-08/2017.  Project: 3D Graphical User Interface for Localizing Intracranial Electrode Locations  Xu (Jay) Jianxiong, Candidate for M.Eng. Degree, 4/2017-8/2018.  Project: Wireless Power Transfer to Integrated Circuits  Jaimin Joshi, Candidate for M.Eng. Degree, 4/2017-7/2018.  Project: Digital Systems for Real-Time Impedance Spectroscopy  Srinidhi Balasubrahmanya, Candidate for M.Eng. Degree, 6/2017-7/2018.  Project: High-speed Wireline Communications  William Isaac, Candidate for M.Eng. Degree, 8/2018-5/2019.  Project: Bio-electronic Systems for Neural Recording  Atul Grover, Candidate for M.Eng. Degree, 4/2019-9/2019.  Project: Implementation of Support Vector Machine on Memristive Hardware  Szu-Chieh Fang, Candidate for M.Eng. Degree, 4/2019-1/2020.  Project: Design of a Software Interface for a Memristive Machine Learning Platform  Chenxi Tang, Candidate for M.Eng. Degree, 2/2019-4/2020.  Project: Digitally Assisted Analog Front Ends  Jaina Patel, Candidate for M.Eng. Degree, 4/2019-5/2020.  Project: FPGA-based ASIC Test Framework  Kartik Sunil Sharma, Candidate for M.Eng. Degree, 6/2019-5/2020.  Project: Design and verification of on-chip Impedance Measurement Systems  Rakshith Ramesh, Candidate for M.Eng. Degree, 5/2020-8/2020.  Project: Electronic Interfacing with In-vitro Microelectrode Arrays  Yaoming Yin, Candidate for M.Eng. Degree, 1/2020-12/2020.  Project: Layout Design and Characterization of ADC Circuits for Coded-Exposure Image Sensors  Yushi Gavin Guan, Candidate for M.Eng. Degree, 5/2020-4/2021.  Project: Seizure Generation by Generative Adversarial Networks  Guanyan Han, Candidate for M.Eng. Degree, 5/2021- 8/2021.  Project: Successive Approximation ADC for an Image Sensor | | | | | | |
| UNDERGRADUATE DESIGN PROJECT AND THESIS ADVISEES | | | | | | | |
|  | 2003-2004  2004-2005  2005-2006  2006-2007  2007-2008  2008-2009  2009-2010  2011-2012  2012-2013  2013-2014  2014-2015  2015-2016  2017-2018  2018-2019  2019-2020  2021-2022 | King Sun (Francis) Tam  T.K. Chan  Po-Yu Liu  Mustafa Alam  Ahmad Attia  Ajmal Khan  Taha Sheikh  Houman Akbari  Negar Habibi  Yasaman Faghih  John Tan  Colin Li  Chuan Qin  Ruslana Gelman  Angie Mehta  Khaled Qasmieh  Khalil Oudah  Tina Tahmoures-Zadeh  Jon Perras  Natasha Baker  Brian Choi  David Wu  Kim Liu  Eric Pai  Ryan Payogo  Fady Akladios  Benny Tu  David Crockett  Vadim Smolyakov  Chi Kin Chong  Muhammad Farhandar  Robert Gunabalendra  Horia Popovici  Visnuthanan Siritharan  John Sison  Darshan Thothiraling  Wen Jie Yan  Xin Yun Zhang  Zhao Yuan Zheng  Miaad Seyed Aliroteh  Adam Shier  Nikita Tarakanov  Siddharth Kaul  Chan Hu Ngen  Junaid Ikram  Sheraz Qadeer  Richard Gao  Derek Peterson  Kyeong (Kris) Kang  Guang-Yo (Zack) Tzeng  Chang Liu  David Galus  Terrence Cole Millar  Dan Litovitz  Chi-Chun Tien  Peter Zhi Xuan Li  Nhien Tran-Nguyen  Francis Kang  Derek Lam  Yae Seoung (Yuni) Kim  Ashley Hung  Timothy Yeung  Jaden Reimer | (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project, co-supervised with Prof. B. Bardakjian)  (design project, co-supervised with Prof. B. Bardakjian)  (design project, co-supervised with Prof. B. Bardakjian)  (design project)  (design project)  (design project)  (design project)  (design project)  (undergraduate thesis)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (undergraduate thesis)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (undergraduate thesis)  (design project)  (design project)  (design project)  (design project)  (design project)  (design project)  (undergraduate thesis)  (undergraduate thesis)  (undergraduate thesis)  (undergraduate thesis)  (undergraduate thesis)  (undergraduate thesis)  (undergraduate thesis)  (design project)  (design project)  (undergraduate thesis)  (undergraduate thesis)  (undergraduate thesis)  (undergraduate thesis)  (undergraduate thesis)  (design project)  (design project)  (design project) | | | | |
| UNDERGRADUATE RESEARCH ADVISEES | | | | | | | |
|  | 2004  2005  2006  2011  2013  2014  2015  2016  2017  2018  2019  2020  2021  2022 | Alborz Jooyaie  John Tan  Hsiang-Hua (Andy) Hung  Ruslana Gelman  Jasper Chan  Gaurav Jain  Stephen Chin  Khalil Oudah  Amogh Vidwans  Kevin Gumba  Alison Ma  Renan Goulart Heinzen  Caroline Marinho Mano  Pedro Veit Michel  Willian Beneducci  Marcelo Bissi Pires  Fadime Bekmambetova  Fu-Der (Fred) Chen  Behraz Vatankhahghadim  Peter Zhi Xuan Li  Seyedeh Sana Tonekaboni  Christopher Lucasius  Sepehr Semsar  Alan Li  Gairik Dutta  Shreedutt Hegde  Jesse Barcelos  Chengzhi (Winston) Liu  Terrence Cole Millar  Mary Catherine McIntosh  Anastasia Kolesnikov  Peter Tanugraha  Ethan Wen  Dayeol Choi  Peter Zhi Xuan Li  Akshay Kamath  Sepehr Semsar  Kamyar Ghofrani  R. Andrei Romero Alvarez  Ji Tong (Michael) Yin  Terrence Cole Millar  Nikita Gusev  Winston Liu  Vincent Lo  Nafis Ahbab  Anas Ahmed  Sanjana Seerala  Ali Haydaroglu  Yin Tai Huang  Hui Feng Ke  Shichen Lu  Gilead Posluns  Shahryar Rajabzadeh  Hui Di Wang  Jinzhuo (Sarah) Tang  Ziming (Michael) Xiong  Qingchong Zeng  Ken Chen  *Led by G. O’Leary:*  Farhad Yusufali  Francis Kang  Adam Gierlach  Jamie Koerner  Sonali Dey  *Led by R. Pazhouhandeh:*  Michael Karras  Zhiwei Liu  Nhien Tran-Nguyen  Saad Jameel  *Led by M. ElAnsary*  Zihan (Simon) Zhao  Michelle Tessy  M.Mustafa Arif  *Led by R. Gulve*  Tobias Rozario  Yangfan Wang  Alexander Buck  Yuanli (Danny) Ding  Xinyi (Cindy) Hou  Qingchong Zeng  Tianyi (Ronan) Zhang  *Led by G. O’Leary:*  Nizar Islah  Aditya Saigal  Adam Gierlach  Shounak Sural  Bipasha Goyal  *Led by A. Amirsoleimani:*  Nhien Tran Nguyen  Martin Ffrench  Tony Liu  *Led by R. Gulve:*  Sharon Lin  En Xu Li  Dylan Hai-Hien Dao  Xin Chen  Yifan Cui  Rain Wu  *Led by J. Sales:*  Sidharth Thomas  *Led by A. Amirsoleimani:*  Louis Primaue  Tony Liu  Benjamin Chang  Tengyu Song  Chenqi Li  Shawn Zhang  Shakiba Tonekabonipour  Michael Xiong  Szu-Chieh Fang  Daniel Pinheiro Leal  Vince Tran  Vince Tran  *Led by G. O’Leary:*  Jake Sprenger  Ahmed Abdelmoneim  Rakshith Ramesh  Maitreyi Joshi  Nizar Islah  Yushi Gavin Guan  Zhiyu Yang  *Led by R. Gulve:*  Alex Buck  Sean Wu  Kathy Zhuang  Abdullah Mohammed  Margarita Diaz  Abhay Gopinathan  Drini Kerciku  Zongyan (Paul) Yao  Selina Wan  *Led by J. Sales:*  Samantha Unger  Karissa Chan  Colin Graham  *Led by J. Sales:*  Albert Huang  Haoxiang Yang  Arielle Zhang  Patty Liu  Guozhen Ding  *Led by G. O’Leary:*  Cameron Rodriquez  Robert Purcaru  Soliman Ali  Kevin Zhu  Fabin Flasius  Chirag Sethi  *Led by R. Rangel:*  Qianqian Zhang  Leo Hanxu  Arash Dehkordi  Iliya Shofman  Nicholas Popowich  Xiaonong Frank Sun  *Led by A. Amirsoleimani:*  Tony Fu  Jack Cai  Brian Chen  Vince Tran  Ali Alsharaawi  Rishabh Saini  Xuening Ding  Jonathan Wu  Tianyi Tim Zhang  Rico Zhu  Kevin Wang  Louis Primaue  Benjamin Cheng  Chenqi Li  *Led by N. Ghoroghchian:*  Hanna Singurdson  Lokeesan Kaneshwaran  Nick Nabavi  *Led by J. Sales:*  Shafinul Haque  Kemeng Han  Yuan (Jenny) Sui  Ourong Lin  *Led by A. Amirsoleimani:*  Xun Cai  Yan Zhu  Timothy Zhang  Arielle Zhang  Louis Primeau  Chenxin Zheng  Jonathan Woo  Xuening Dong  Ali Al-sharaawi  Brian Chen  Hao You  Muhammad Ahsan Kaleem  *Led by S. Nag:*  Mengyan Zhu  Kevin Kim  *Led by R. Rangel:*  David Shemesh  Bora Bayazit  Deeksha Tewari  Karthikeyan R  *Led by M. Abdolrazzaghi:*  Aditya Sharma  *Led by F. Torres:*  Aditya Mohan | | (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (summer student)  (MITACS summer student from India)  (NSERC USRA summer student)  (NSERC USRA summer student)  (summer student from Brazil)  (summer student from Brazil)  (summer student from Brazil)  (summer student from Brazil)  (summer student from Brazil)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (MITACS summer student from India)  (MITACS summer student from India)  (summer research student)  (summer research student)  (summer research student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (summer intern from Department of Math)  (summer intern from Department of Math)  (volunteer research student)  (MITACS summer student from India)  (summer research student)  (summer research student from U. of Waterloo)  (summer research student from Department of CS)  (summer research student, from Department of EngSci)  (summer intern)  (NSERC USRA summer student)  (research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (UTEA-NSE summer student)  (summer research student)  (summer research student)  (summer research student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (First Year Student Research Fellowship)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (summer research student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (ECE Admission Research Scholar)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (summer research student)  (summer research student)  (summer research volunteer)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (MITACS summer student from India)  (ESROP summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (summer research volunteer)  (NSERC USRA summer student)  (NSERC USRA summer student)  (NSERC USRA summer student)  (UTEA-NSE summer student)  (UTEA-NSE summer student)  (summer research student)  (MITACS summer student from India)  (NSERC USRA research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (NSERC USRA research student, Fall term)  (FYSRP summer student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (MITACS summer student from China)  (summer research student)  (ESROP summer student)  (ESROP summer student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (ESROP summer student)  (summer research student)  (NSERC USRA research student)  (NSERC USRA research student)  (summer research student)  (NSERC USRA research student)  (NSERC USRA research student)  (summer research student)  (NSERC USRA research student)  (summer research student)  (summer research student)  (summer research student)  (NSERC USRA research student)  (NSERC USRA research student)  (summer research student)  (summer research student)  (summer research student)  (NSERC USRA research student)  (summer research student)  (summer research student)  (summer research student)  (NSERC USRA research student)  (summer research student)  (ESROP research student)  (ESROP research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (NSERC USRA research student)  (summer research student)  (summer research student)  (Part-time summer research student)  (Part-time summer research student)  (Part-time summer research student)  (NSERC USRA research student)  (NSERC USRA research student)  (summer research student)  (NSERC USRA research student)  (UTEA-NSE summer student)  (summer research student)  (summer research student)  (NSERC USRA research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (summer research student)  (NSERC USRA research student)  (summer research student)  (summer research student)  (NSERC USRA research student)  (UTEA-NSE summer student)  (MITACS summer student from India)  (MITACS summer student from India)  (MITACS summer student from India) | | | |

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| TEACHING | |
|  | “Selected Topics in Circuits and Systems – VLSI Circuits and Systems for Pattern Recognition,” ECE1390, 9/2003-12/2003 (5 graduate students).  “VLSI Design Methodology,” ECE1388, 9/2004-12/2004 (26 graduate students), 9/2005-12/2005 (16 graduate students), 9/2006-12/2006 (13 graduate students), 9/2007-12/2007 (25 graduate students), 9/2008-12/2008 (13 graduate students), 9/2009-12/2009 (33 graduate students), 9/2010-12/2010 (12 students), 9/2011-12/2011 (25 students), 9/2012-12/2012 (21 students), 9/2013-12/2013 (42 students), 9/2014-12/2014 (17 students), 9/2015-12/2015 (19 students), 9/2016-12/2016 (48 students), 9/2017-12/2017 (27 students), 9/2018-12/2018 (25 students), 9/2019-12/2019 (27 students), 1/2021-4/2021 (22 students), 9/2021-12/2021 (19 students), 9/2022-12/2022 (30 students).  “Analog Electronics,” ECE530, 1/2004-4/2004 (55 students), 1/2005-4/2005 (65 students), 1/2006-4/2006 (89 students), 1/2007-4/2007 (66 students), 1/2008-4/2008 (44 students), 1/2009-4/2009 (54 students), 1/2010-4/2010 (52 students).  “Digital Electronics,” ECE334, 1/2012-4/2012 (97 students), 1/2013-4/2013 (81 students), 1/2014-4/2014 (97 students), 1/2015-4/2015 (132 students, 2 sections), 1/2016-4/2016 (103 students), 1/2017-4/2017 (122 students), 1/2018-4/2018 (59 students), 9/2019-12/2019 (70 students), 1/2021-4/2021 (78 students), 9/2021-12/2021 (81 students), 9/2022-12/2022 (67 students).  “Electronics,” ECE360 09/2011-12/2011 (73 students), 9/2012-12/2012 (78 students), 9/2013-12/2013 (64 students), 9/2015-12/2015 (49 students), 9/2016-12/2016 (45 students).  “Introductory Electronics,” ECE231, 1/2003-4/2003 (89 students), 1/2004-4/2004 (87 students), 1/2005-4/2005 (88 students), 1/2006-4/2006 (70 students), 1/2007-4/2007 (60 students), 1/2008-4/2008 (107 students), 1/2009-4/2009 (103 students; 320 students coordinated), 1/2010-4/2010 (91 students, 315 students coordinated).  “Introduction to Electrical and Computer Engineering,” ECE101, 2011-2016 (one lecture per year).  “Electrical and Computer Engineering Seminar,” ECE201, 2015 (one lecture per year). |

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| SHORT COURSES/TUTORIALS | |
|  | “Implantable Neurotechnologies: from Circuits and Signals to Systems and Applications,” half-day tutorial (with N. Thakor and M. Sawan), IEEE International Symposium on Circuits and Systems, 2016.  “Amperometric Electrochemical Sensing in CMOS: Applications, Methods and Implementations,” invited plenary tutorial (with P. Mohseni), Biomedical Circuits and Systems Conference, San Diego, Nov. 10, 2011.  “Pattern Recognition at 1GOPS/mW and Beyond: Massively Parallel Mixed-Signal VLSI Storage, Computing and Data Conversion,” half-day intensive course, Microelectronics Strategic Alliance of Quebec (ReSMiQ), Montreal, QC, March 4, 2005. |

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| INVITED PRESENTATIONS | |
|  | “Artificially-intelligent Closed-loop Neurostimulators for the Treatment of Neurological Disorders,” IEEE European Solid-State Circuits Conference (ESSCIRC’21), Educational Workshop on Emerging Solutions for Sensors and Imagers, Circuits and Systems, Grenoble, France, Sept. 20, 2021.  “Design Challenges in Closed-loop Neuromodulators: Case Study of Intractable Epilepsy,” IEEE Custom Integrated Circuits Conference (CICC’21), Forum on Human Brain-Machine Interfaces, Apr. 29, 2021.  “Coded-pixel Multi-exposure Single-shot Image Sensors,” IEEE European Solid-State Circuits Conference (ESSCIRC’20), Educational Workshop on Emerging Solutions for Imaging Devices, Circuits and Systems, Sept. 2020.  “Coded-exposure-pixel Image Sensors,” Imaging and Applied Optics Congress, Computational Optical Sensing and Imaging Meeting, June 24, 2020.  “Electronic Design Challenges in Closed-loop Neuromodulation,” CRANIA Conference, Toronto, Sept. 16, 2019.  “Demo: Dual-Tap Pipelined-Code-Memory Coded-Exposure-Pixel CMOS Image Sensor for Multi-Exposure Single-Frame Computational Imaging,” IEEE International Solid-State Circuits Conference (ISSCC’2019), Live Demonstration, San Francisco, Feb. 2019.  “Active Illumination and Imaging across 10^-3-10^-12 s Timescales for General LOS/NLOS Scene Understanding: Programmable-pixel Image Sensors”, 36-month PI Review Meeting (with S. Narasimhan, K. Kutulakos), Arlington, VA, Apr. 3, 2019.  “CMOS Image Sensors with Per-Pixel Coded Exposure,” Computational Light Transport Workshop, Banff International Research Station, Banff, AB, February 11, 2019.  “Implantable Chips for Neural Recording and Stimulation,” EAEEG 72nd Annual Meeting, Toronto, Feb. 18. 2018.  “Energy-Efficient Computational Light Transport Parsing: Computational Cameras,” 24-month PI Review Meeting (with S. Narasimhan, K. Kutulakos), Arlington, VA, Mar. 13, 2018.  “Brain Monitoring and Modulation Building next generation Responsive Brain Stimulators,” Ontario Brain Institute EpLink Workshop (with T. Valiante), Nov. 11, London, 2017.  “Energy-Efficient Computational Light Transport Parsing: Programmable-pixel Image Sensors”, 18-month PI Review Meeting (with S. Narasimhan, K. Kutulakos), Arlington, VA, Sept. 26, 2017.  “Electrochemical Monitoring of Epilepsy: the Technology,” Invited Talk, 2017 EpLink Fellows Meeting, University of Toronto, Faculty of Medicine, Apr. 7, 2017.  “Pixel-programmable Structured-Light CMOS Imagers,” Annual Meeting, Orlando, FL, Mar. 14, 2017.  “Pixel-programmable Structured-Light Imaging Device Design,” Site Visit, Pittsburgh, PA, January 30, 2017.  “Brain Synchrony-Contingent Neurostimulators for Treatment of Drug-Resistant Epilepsy,” Invited Plenary Talk, 2016 Anne & Max Tanenbaum Symposium on The Frontiers of Science “Listening and Responding to the Brain: Neuroengineering and Epilepsy,” University of Toronto, Faculty of Medicine, November 2, 2016.  “Energy-Efficient Computational Light Transport Parsing: Imaging Device Design,” Progress Meeting, Washington, DC, September 14, 2016.  “Electronic Microsystems for Intracranial Monitoring, Diagnostics and Treatment of Neurological Disorders,” Seminar, Department of Electrical and Electronic Engineering, Imperial College London, September 5, 2016.  “Integrated Circuits for Electrochemical Sensing: Microsystems and Applications,” Seminar, Department of Electrical and Electronic Engineering, Imperial College London, August 26, 2016.  “Brain Synchrony-Contingent Neurostimulators for Treatment of Drug-resistant Epilepsy,” Invited Talk on New Medical Devices and Neuromodulation, 13th EILAT Conference on New Antiepileptic Drugs and Devices, June 29, 2016.  “Trade-offs Between Wireless Communication and Computation in Closed-loop Implantable Devices,” Invited Talk on Brain Interfaces, IEEE Int. Symp. on Circuits and Systems, May 23, 2016.  “Microsystems for Intracranial Monitoring, Diagnostics and Treatment of Neurological Disorders,” Seminar, Department of Biomedical Engineering, Florida International University, April 13, 2016.  “Multi-sensor Integrated Circuits: Biomedical Microsystems and Applications,” Seminar, Departments of Electrical and Biomedical Engineering, Columbia University, December 15, 2015.  “SSC/CAS Societies Members Brain-Related Research Activities Overview,” IEEE Brain Initiative Workshop, New York, December 14, 2015.  “Multi-sensor Integrated Circuits: Microsystems and Biomedical Applications,” Seminar, Department of Electrical Engineering, Princeton University, December 11, 2015.  “Multi-sensor Integrated Circuits: Materials, Systems and Applications,” Seminar, Brockhouse Institute for Materials Research, McMaster University, November 2, 2015.  “Implantable Wireless Closed-Loop Neurostimulators for the Treatment of Intractable Epilepsy,” IEEE International Symposium on Circuits and Systems, John Choma Commemorative Session, Lisbon, Portugal, May 25, 2015.  “Wireless Microelectronic Implants for the Treatment of Intractable Epilepsy,” Ontario Brain Institute, EpLink Workshop, Toronto, ON, February 28, 2015.  “Implantable Electronic Microchips for Automated Monitoring, Diagnostics, and Treatment of Neurological Disorders,” Sunnybrook Health Sciences Centre, Brain Sciences Program and Department of Otolaryngology, Toronto, ON, January 29, 2015.  “Sensory Biomedical Electronics: Implantable, Wearable and Disposable Integrated Circuits,” Douglas Mental Health University Institute and McGill University, Montreal, QC, June 14, 2013.  “Sensory Biomedical Electronics: Implantable, Wearable and Disposable Integrated Circuits,” Department of Electrical and Computer Engineering, McGill University, June 17, 2013.  “CMOS Intelligent Sensory Microsystems for Biomedical Applications,” Georgia Institute of Technology, Atlanta, GA, June 21, 2011.  “Implantable Integrated Circuits for Monitoring, Diagnostics and Treatment of Neurological Disorders,” Research Institute for Neurosciences and Mental Health, The Hospital for Sick Children, Toronto, ON, March 16, 2011.  “Amperometric Neurochemical Microarrays: Electronic Chips that Image Neurotransmitters,” Toronto Western Hospital, Cell and Molecular Neurobiology Lab, Toronto, ON, January 19, 2011.  “Towards Wireless Brain Activity Monitoring and Modulation,” CMC Microsystems Sensor Network Workshop, Ottawa, ON, October 6, 2010.  “Amperometric Neurochemical and DNA Microarrays,” CMC Microsystems Annual Symposium, Ottawa, ON, October 5, 2010.  “Electronic Microchips for Recording and Modulating Neural Activity,” Beyond Brain Machine Interface: From Senses to Cognition Workshop, Long Beach, CA, June 20, 2010.  “Intelligent Sensory Microsystems for Biomedical Applications,” IMEC, Leuven, Belgium, May 28, 2010.  “CMOS Luminescence Contact Imaging Microsystems,” CMC CMOS Imagers Workshop, Montreal, QC, November 5, 2009.  “Intelligent Sensory Microsystems,” CMC Microsystems, Kingston, ON, October 22, 2009.  “Intelligent Sensory Microsystems for Biomedical Applications,” Department of Bioengineering, University of California, San Diego, CA, August 10, 2009.  “Intelligent Sensory Microsystems” Max Planck Institute for Metals Research, Stuttgart, Germany, May 7, 2009.  “Intelligent Sensory Microsystems: Signal Processing,” Max Planck Institute for Biological Cybernetics, Tubingen, Germany, May 5, 2009.  “Intelligent Sensory Microsystems: Information Acquisition,” Max Planck Institute for Biological Cybernetics, Tubingen, Germany, May 4, 2009.  “Hybrid Intelligent Sensory Microsystems,” CMC Hybrid Integration Workshop, Toronto, ON, January 14, 2009.  “Electro-Chemical Integrated Neural Interfaces,” National Research Council (NRC) of Canada, Neurochip Development Initiative - Strategic Meeting, Invited Talk, Ottawa, ON, November 2006.  “Electro-Chemical Integrated Neural Interfaces,” National Research Council (NRC) of Canada, Institute for Biological Sciences, Invited Seminar, Ottawa, ON, October 2006.  “Kerneltron: Massively Parallel Mixed-Signal VLSI Pattern Recognition Processor,” Centre for Vision Research, York University, Toronto, ON, March 11, 2005.  “Kerneltron: Massively Parallel Mixed-Signal VLSI Pattern Recognition Processor,” IEEE EDS/CAS Western New York Conference, Invited Plenary Talk, Rochester, NY, Nov. 3, 2004.  “A 1GMACS/mW Mixed-Signal Differential-Charge CID/DRAM Processor,” IEEE Int. Conf. on Circuits and Systems for Communications (ICCSC’04), Invited Plenary Talk, Moscow, Russia, June 30 - July 2, 2004.  “Kerneltron: Massively Parallel Mixed-Signal VLSI Pattern Recognition Processor,” Invited Seminar, Rochester Institute of Technology, Rochester, NY, Apr. 30, 2004.  “Kerneltron: Support Vector ‘Machine’ in Silicon,” VLSI Seminar Series, School of Electrical and Computer Engineering, Cornell University, Ithaca, NY, Nov.13, 2003. |
| PROFESSIONAL ACTIVITIES | |
|  | Associate Editor:  IEEE Transactions on Biomedical Circuits and Systems, 2006-present.  IEEE Transactions on Circuits and Systems-II: Express Briefs, 2010-2012.  IEEE Signal Processing Letters, 2008-2010.  Guest Associate Editor:  IEEE Journal of Solid-State Circuits, Special Issue on papers from the International Solid-State Circuits Conference (ISSCC), 2016.  IEEE Transactions on Biomedical Circuits and Systems, Special Issue/Section on papers from the International Solid-State Circuits Conference (ISSCC), 2014-2020.  International Technical Program Committee Member, IEEE Solid-State Circuits Conference (ISSCC):  Member of Imagers, MEMS, Medical, and Displays (IMMD) Subcommittee, 2013-2016.  Member of Forum Committee: “Circuit, Systems and Data Processing for Next Generation Wearable and Implantable Medical Devices,” 2015-2016.  Member of Demonstrations Subcommittee, 2013-2014.  Technical Program Committee Member, IEEE European Solid-State Circuits Conference (ESSCIRC):  Member of Sensors, Imagers and Biomedical Subcommittee, 2019.  Technical Program Committee Member:  IEEE International Symposium on Circuits and Systems (ISCAS), 2016, 2020.  IEEE Biomedical Circuits and Systems Conference (BioCAS), 2007, 2008, 2011, 2019.  IEEE Northeast Workshop on Circuits and Systems (NEWCAS), 2006, 2007, 2008, 2009, 2016.  IEEE Midwest Symposium on Circuits and Systems (MWSCAS, joint with NEWCAS), 2007.  IEEE 6th Electro/Information Technology Conference, 2006.  SPIE Bioengineered and Bioinspired Systems Conference, 2003, 2005.  ACM Great Lakes Symposium on VLSI (GLSVLSI), 2003.  Steering Committee Member:  IEEE Brain Initiative, Conferences Sub-committee, 2015-2016.  Scientific Review Panel Member:  National Institutes of Health (NIH), National Institute of Neurological Disorders and Stroke (NINDS), the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) initiative, 2014-2017.  National Sciences and Engineering Research Council of Canada (NSERC) Strategic Projects Selection Panel, 2008-2009.  CMC Microelectronics, National IC Fabrication Allocation Committee, 2009-2011.  Technical Program Co-chair:  IEEE Biomedical Circuits and Systems Conference (BioCAS), 2007.  Tutorials Committee Co-chair:  IEEE Biomedical Circuits and Systems Conference (BioCAS), 2011.  IEEE Biomedical Circuits and Systems Conference (BioCAS), 2019.  Track Chair/Co-chair:  IEEE International Conference of the Engineering in Medicine and Biology Society (EMBC), “Neural Microsystems and Instrumentation” Track Co-chair, 2006.  Special Sessions Committee Co-chair:  IEEE Northeast Workshop on Circuits and Systems (NEWCAS), 2016.  IEEE International Symposium on Circuits and Systems (ISCAS), 2020.  External Advisory Board Member:  Department of Electrical Engineering, Rochester Institute of Technology, 2004-2010.  Professional Society Member:  Institute of Electrical and Electronic Engineers (IEEE).  Circuits and Systems (CAS) Society.  Solid-State Circuits (SSC) Society.  Engineering in Medicine and Biology (EMB) Society.  Technical Committee Member:  Analog Signal Processing TC of IEEE CAS Society.  Neural Systems and Applications TC of IEEE CAS Society.  Biomedical Circuits and Systems TC of IEEE CAS Society.  Sensory Systems TC of IEEE CAS Society.  Session Organizer/Co-organizer:  “Smart Optogenetic Bio-electronic Interfaces,” Special Invited Session (BioCAS), 2015.  “Electrochemical Sensory Microsystems,” Special Invited Session (BioCAS), 2007.  “Integrated Neural Implants,” Special Invited Session (ISCAS), 2007.  “Integrated Neural Interfaces,” Special Invited Session (ISCAS), 2006.  International Liaison:  IEEE Solid-State Circuits Society, Liaison to professional societies the fields of Medicine and Biology, 2015-2019.  IEEE Biomedical Circuits and Systems Conference (BioCAS), 2016.  IEEE 4th International Symposium on Electronic Design, Test and Applications, 2008.  Conference Review Committee Member:  Review Committee, IEEE International Symposium on Circuits and Systems (ISCAS), 2003-2009.  Industry and Exhibitions Co-chair:  IEEE International Symposium on Circuits and Systems (ISCAS), 2016.  Conference Session Chair/Co-chair:  IEEE International Symposium Circuits and Systems (ISCAS): “Self-Correcting ADC,” 2002; “Neural Systems and Applications,” 2004; “Neural Computation,” “Neural Classifiers,” 2005; “Medical Interfacing System,” “Integrated Neural Interfaces” (Special Session), “Switched Capacitor Circuits,” “Analog Filtering & Signal Processing,” 2006; “Integrated Neural Implants” (Special Session), 2007; “Biomedical Circuits and Systems for Neural Recording,” 2009.  IEEE Biomedical Circuits and Systems Conference (BioCAS), “Electrochemical Sensory Microsystems,” “Bio-Signal Processing,” 2007.  SPIE International Symposium on Microtechnologies, Bioengineered and Bioinspired Systems, “Biosensors,” 2003.  Canadian Microelectronics Corporation / CMC Microsystems, Representative from the University of Toronto, 2010-current.  University/Department Committees Member:  Electronics Group, Chair, 2015-2017.  Graduate Matters Committee, 2014-2017.  Examinations Committee, Faculty of Engineering, 2018-2021.  Awards Committee, Department of Electrical and Computer Engineering, 2012-2013, 2015-2016.  OGS Panel Member, University of Toronto, 2009-2010, 2011-2012.  Graduate Coordinator, Electronics Group, Department of Electrical and Computer Engineering, 2008-2010, 2011-2014.  Awards and Scholarships Committee, Faculty of Applied Science and Engineering, 2007-2010.  Curriculum Matters Committee, Department of Electrical and Computer Engineering, 2005-2010, 2011-2013, 2019-2021.  PTR Committee, Department of Electrical and Computer Engineering, 2020-2022. |
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