

## Roman Genov

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### RESEARCH INTERESTS

Analog integrated circuits and systems for energy-constrained biological, medical, and consumer sensory applications, such as implantable, wearable or disposable sensory microsystems, energy-efficient sensory signal processors and wireless sensors, including brain-chip interfaces, neuro-stimulators, image sensors, optical and electro-chemical DNA microarrays, and other 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 Learning.

**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**

- 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 (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**

- 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.
- 1<sup>st</sup> 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 Competition (with A. Bagheri and S. Gabran, prize \$3,000), 2012.
- Brian L. Barge Award for Excellence in Microsystems Integration, the winner of CMC TEXPO National Student Research Competition (with H. Jafari, \$3,500 prize), 2008 and (with H. Kassiri and N. Soltani, \$3,500 prize), 2012.
- DALSA Corporation Award for Excellence in Microsystems Innovation, the winner of a CMC TEXPO National Student Research 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), 2016.
- 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
“Programmable Camera Systems for Transport-Aware Imaging,” co-PI, NSERC Research Tools and Instruments, 4/2018-3/2019.	\$148,509	\$148,509
“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.	\$127,200	\$636,000
“Artificially Intelligent Neurostimulators for Drug-Resistant Epilepsy,” PI, Canadian Institutes of Health Research (CIHR), Project Grant, 4/2017-3/2022.	\$600,000	\$1,100,000
“Transport-Aware Image Sensors,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Discovery Award, 05/2017-04/2022.	\$58,000	\$290,000
“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.	\$62,000	\$186,000
“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.	\$30,000	\$60,000
“Artificially Intelligent Neurostimulators for Drug-Resistant Epilepsy,” PI, Canadian Institutes of Health Research (CIHR), Project Grant, Bridge Funding, 9/2016-9/2017.	\$100,000	\$100,000
“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.	\$77,400	\$232,200
“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.	\$50,500	\$151,500
“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.	\$20,000	\$40,000
“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.	\$60,833	\$182,500
“Research Instruments for Experimental Characterization of Wireless Biomedical Sensory Microsystems,” PI, NSERC Research Tools and Instruments, 4/2012-3/2013.	\$145,545	\$145,545
“Electronic Microsystems for Ubiquitous Biomedical Sensing,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Discovery Award, 05/2012-04/2017.	\$21,750	\$108,750
“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),	\$75,150	\$225,450

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.	\$78,240	\$234,720
Short-term contract, PI, Industrial Partner, 2/2008-3/2008.	\$10,000	\$10,000
“Electro-Optical Microsystem for DNA Detection,” PI, Ontario Centres of Excellence, Centre for Photonics, 1/2008-9/2008.	\$30,000	\$30,000
“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.	\$8,000	\$8,000
“Integrated Neural Interfaces for Epileptic Seizure Monitoring“, Co-I, subcontract from Prof. P. Carlen, University Health Network, University of Toronto, 9/2006-8/2008.	\$13,250	\$26,500
“Hybrid Integration Technologies for Optical DNA Detection,” peer-reviewed Hybrid Integration project, PI, Canadian Microelectronics Corporation, 1/2008-12/2008.	\$14,000	\$14,000
“Smart Sensory Microsystems,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Discovery Award, 05/2007-04/2012.	\$22,500	\$112,500
NSERC Industrial Postgraduate Scholarship (recipient: M.A.Sc. student Farzaneh Shahrokhi), Medtrode Corporation, 9/2006-8/2008.	\$6,000	\$12,000
“Hybrid Integration Technologies for Brain-Chip Interfaces,” Hybrid Integration project, PI, Canadian Microelectronics Corporation, 2006.	\$5,000	\$5,000
Infrastructure Operating Fund Award, PI, Canada Foundation for Innovation (CFI), 4/2006-3/2010.	\$7,517	\$30,068
“Intelligent Sensory Integrated Systems,” PI, New Opportunities Award, Canada Foundation for Innovation (CFI), 11/2005-3/2008.	\$33,408	\$100,226
“Intelligent Sensory Integrated Systems,” PI, Ontario Research Fund, 11/2005-3/2008.	\$33,408	\$100,226
“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.	\$17,225	\$34,450
“Autonomous Integrated Vision Systems,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Discovery Award, 05/2003-04/2007.	\$20,850	\$83,400
“Mixed-Signal VLSI Circuits and Systems,” PI, Connaught Foundation, 10/2002.	\$10,000	\$10,000
“Mixed-Signal VLSI Circuits and Systems,” PI, University of Toronto, ECE Dept., 10/2002.	\$100,000	\$100,000

## **CURRENT GRADUATE / POST-GRADUATE RESEARCH ADVISEES**

### **Post-Doctoral Fellows / Scientists**

David Groppe (PhD, UCSD USA) Post-Doctoral Fellow / Research Scientist, 09/2016-current (co-supervised with Prof. Valiante, 50%).

Zhengfan Xia (PhD, Tohoku University Japan), Post-Doctoral Fellow, 10/2017-current (co-supervised with Prof. Kutulakos, 50%).

Amirali Amirsoleimani (PhD, University of Windsor Canada), Post-Doctoral Fellow, 2/2018-current.

Xuan-Thuan Nguyen (PhD, University of Electro-Communications Japan), Post-Doctoral Fellow, 3/2018-current.

**PhD Students**

Navid Sarhangnejad, Candidate for Ph.D. Degree, 09/2014-current.

Maged ElAnsary, Candidate for Ph.D. Degree, 09/2015-current.

Reza Pazhouhandeh, Candidate for Ph.D. Degree, 09/2015-current.

Gerard O'Leary, Candidate for Ph.D. Degree, 09/2017-current.

Rahul Gulve, Candidate for Ph.D. Degree, 09/2017-current.

Nafiseh Ghoroghchian, Candidate for Ph.D. Degree, 09/2017-current (co-supervised with Prof. Draper, 50%).

Jose Sales Filho, Candidate for Ph.D. Degree, 05/2018-current.

John Straguzzi, Candidate for Ph.D. Degree, 09/2018-current current (co-supervised with Prof. Poon, 50%).

**MASc Students**

Gairik Dutta, Candidate for M.A.Sc. Degree, 07/2016-current.

Nikita Gusev, Candidate for M.A.Sc. Degree, 09/2017-current.

Saima Ali, Candidate for M.A.Sc. Degree, 09/2017-current (co-supervised with Prof. Popovic).

Liam Long, Candidate for M.A.Sc. Degree, 07/2018-current (co-supervised with Profs. Valiante and Yoo).

Jamie Koerner, Candidate for M.A.Sc Degree, 09/2018-current (co-supervised with Prof. Valiante, 50%).

Amirhesam Abedsoltan, Candidate for M.A.Sc. Degree, 09/2018-current.

**MEng Students**

Xu (Val) Jianxiong, Candidate for M.Eng. Degree, 4/2017-current.

Jaimin Joshi, Candidate for M.Eng. Degree, 4/2017-current.

Srinidhi Balasubrahmanya, Candidate for M.Eng. Degree, 6/2017-current.

**FORMER GRADUATE RESEARCH ADVISEES****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

Previously: 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

Currently: 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

Nikola Katic (PhD EPFL, Switzerland), Post-Doctoral Fellow, 04/2016-06/2017 (co-supervised with Prof. Kutulakos, 50%).

Project: Transport-aware Image Sensors

Currently: Synopsys Canada

**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**

Previously: 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

Currently: Assistant 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

Previously: 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

Currently: 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

Currently: Analog and Mixed-Signal Design Engineer at Synopsis, Toronto

**MASc Students**

Ashkan Olyaei, M.A.Sc. Degree, 09/2003-04/2006.

Thesis: ViPro: Focal-Plane CMOS Spatially-Oversampling Computational Image Sensor

Currently: 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

Previously: 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

Previously: 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

Previously: 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

Previously: 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

Previously: 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

Currently: 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

Previously: 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

Previously: 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

Currently: 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

Currently: Start-up in stealth mode

Gerard O'Leary, Candidate for M.A.Sc. Degree, 09/2015-01/2018.

Thesis: Intelligent Medical Devices for Brain State Classification and Responsive Neuromodulation

Currently: PhD student at the University of Toronto

### **MEng Students**

Yu Hu, M.Eng. Degree, 5/2014-8/2014.

Project: High-Voltage Neural Stimulator with Adaptive Loading Consideration

Atul Patidar, 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: Computational 3-D Camera Design

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

### **UNDERGRADUATE DESIGN PROJECT AND THESIS ADVISEES**

2003-2004 King Sun (Francis) Tam (design project)

T.K. Chan (design project)

Po-Yu Liu (design project)

2004-2005 Mustafa Alam (design project)

Ahmad Attia (design project)

Ajmal Khan (design project)

	Taha Sheikh	(design project)
	Houman Akbari	(design project)
	Negar Habibi	(design project)
	Yasaman Faghih	(design project)
2005-2006	John Tan	(design project, co-supervised with Prof. B. Bardakjian)
	Colin Li	(design project, co-supervised with Prof. B. Bardakjian)
	Chuan Qin	(design project, co-supervised with Prof. B. Bardakjian)
	Ruslana Gelman	(design project)
	Angie Mehta	(design project)
2006-2007	Khaled Qasmieh	(design project)
	Khalil Oudah	(design project)
	Tina Tahmoures-Zadeh	(design project)
	Jon Perras	(undergraduate thesis)
2007-2008	Natasha Baker	(design project)
	Brian Choi	(design project)
2008-2009	David Wu	(design project)
	Kim Liu	(design project)
	Eric Pai	(design project)
	Ryan Payogo	(design project)
	Fady Akladios	(design project)
	Benny Tu	(design project)
	David Crockett	(design project)
	Vadim Smolyakov	(undergraduate thesis)
2009-2010	Chi Kin Chong	(design project)
	Muhammad Farhandar	(design project)
	Robert Gunabalendra	(design project)
	Horia Popovici	(design project)
	Visnuthanan Siritharan	(design project)
	John Sison	(design project)
	Darshan Thothiraling	(design project)
	Wen Jie Yan	(design project)
	Xin Yun Zhang	(design project)
	Zhao Yuan Zheng	(design project)
	Miaad Seyed Aliroteh	(undergraduate thesis)
2011-2012	Adam Shier	(design project)
	Nikita Tarakanov	(design project)
2012-2013	Siddharth Kaul	(design project)
	Chan Hu Ngen	(design project)
	Junaid Ikram	(design project)
	Sheraz Qadeer	(design project)
2013-2014	Richard Gao	(undergraduate thesis)
2014-2015	Derek Peterson	(undergraduate thesis)
	Kyeong (Kris) Kang	(undergraduate thesis)
	Guang-Yo (Zack) Tzeng	(undergraduate thesis)
	Chang Liu	(undergraduate thesis)
2015-2016	David Galus	(undergraduate thesis)
	Terrence Cole Millar	(undergraduate thesis)
	Dan Litovitz	(design project)
	Chi-Chun Tien	(design project)
2016-2017	Peter Zhi Xuan Li	(undergraduate thesis)



**UNDERGRADUATE RESEARCH ADVISEES**

2004	Alborz Jooyaie	(NSERC USRA summer student)
2005	John Tan	(NSERC USRA summer student)
	Hsiang-Hua (Andy) Hung	(NSERC USRA summer student)
	Ruslana Gelman	(NSERC USRA summer student)
	Jasper Chan	(NSERC USRA summer student)
2006	Gaurav Jain	(NSERC USRA summer student)
	Stephen Chin	(NSERC USRA summer student)
	Khalil Oudah	(summer student)
2011	Amogh Vidwans	(MITACS summer student from India)
2013	Kevin Gumba	(NSERC USRA summer student)
	Alison Ma	(NSERC USRA summer student)
	Renan Goulart Heinzen	(summer student from Brazil)
	Caroline Marinho Mano	(summer student from Brazil)
	Pedro Veit Michel	(summer student from Brazil)
	Willian Beneducci	(summer student from Brazil)
2014	Marcelo Bissi Pires	(summer student from Brazil)
	Fadime Bekmambetova	(NSERC USRA summer student)
	Fu-Der (Fred) Chen	(NSERC USRA summer student)
	Behraz Vatankhahghadim	(NSERC USRA summer student)
2015	Peter Zhi Xuan Li	(NSERC USRA summer student)
	Seyedeh Sana Tonekaboni	(NSERC USRA summer student)
	Christopher Lucasius	(NSERC USRA summer student)
	Sepehr Semsar	(NSERC USRA summer student)
	Alan Li	(NSERC USRA summer student)
	Gairik Dutta	(MITACS summer student from India)
	Shreedutt Hegde	(MITACS summer student from India)
	Jesse Barcelos	(summer research student)
	Chengzhi (Winston) Liu	(summer research student)
	Terrence Cole Millar	(summer research student)
2016	Mary Catherine McIntosh	(NSERC USRA summer student)
	Anastasia Kolesnikov	(NSERC USRA summer student)
	Peter Tanugraha	(NSERC USRA summer student)
	Ethan Wen	(summer intern from Department of Math)
	Dayeol Choi	(summer intern from Department of Math)
	Peter Zhi Xuan Li	(volunteer research student)
	Akshay Kamath	(MITACS summer student from India)
	Sepehr Semsar	(summer research student)
	Kamyar Ghofrani	(summer research student from U. of Waterloo)
	R. Andrei Romero Alvarez	(summer research student from Department of CS)
	Ji Tong (Michael) Yin	(summer research student, from Department of EngSci)
	Terrence Cole Millar	(summer intern)
	Nikita Gusev	(NSERC USRA summer student)
	Winston Liu	(research student)
	Vincent Lo	(summer research student)
	Nafis Ahbab	(summer research student)
	Anas Ahmed	(summer research student)
	Sanjana Seerala	(summer research student)

2017	Ali Haydaroglu	(NSERC USRA summer student)
	Yin Tai Huang	(NSERC USRA summer student)
	Hui Feng Ke	(NSERC USRA summer student)
	Shichen Lu	(NSERC USRA summer student)
	Gilead Posluns	(NSERC USRA summer student)
	Shahryar Rajabzadeh	(NSERC USRA summer student)
	Hui Di Wang	(NSERC USRA summer student)
	Jinzhao (Sarah) Tang	(UTEA-NSE summer student)
	Ziming (Michael) Xiong	(summer research student)
	Qingchong Zeng	(summer research student)
	Ken Chen	(summer research student)
2018	Led by G. O’Leary:	
	Farhad Yusufali	(NSERC USRA summer student)
	Francis Kang	(NSERC USRA summer student)
	Adam Gierlach	(NSERC USRA summer student)
	Jamie Koerner	(NSERC USRA summer student)
	Sonali Dey	(First Year Student Research Fellowship)
	Led by R. Pazhouhandeh:	
	Michael Karras	(NSERC USRA summer student)
	Zhiwei Liu	(NSERC USRA summer student)
	Nhien Tran-Nguyen	(NSERC USRA summer student)
	Saad Jameel	(summer research student)
	Led by M. ElAnsary	
	Zihan (Simon) Zhao	(NSERC USRA summer student)
	Michelle Tessy	(NSERC USRA summer student)
	M.Mustafa Arif	(NSERC USRA summer student)
	Led by R. Gulve	
	Tobias Rozario	(ECE Admission Research Scholar)
	Yangfan Wang	(NSERC USRA summer student)
	Alexander Buck	(NSERC USRA summer student)
	Yuanli (Danny) Ding	(NSERC USRA summer student)
	Xinyi (Cindy) Hou	(summer research student)
	Qingchong Zeng	(summer research student)
	Tianyi (Ronan) Zhang	(summer research volunteer)

## 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), 09/2016-12/2016 (48 students), 09/2017-12/2017 (27 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).

“Electronics,” ECE360 09/2011-12/2011 (73 students), 09/2012-12/2012 (78 students), 09/2013-12/2013 (64 students), 09/2015-12/2015 (49 students), 09/2016-12/2016 (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).

## 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.

## INVITED PRESENTATIONS

“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, March 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, April 7, 2017.

“Pixel-programmable Structured-Light CMOS Imagers,” Annual Meeting, Orlando, FL, March 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, Tübingen, Germany, May 5, 2009.
- “Intelligent Sensory Microsystems: Information Acquisition,” Max Planck Institute for Biological

Cybernetics, Tübingen, 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), 2014-2017.

International Technical Program Committee Member, 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.

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 Co-chair:

IEEE Biomedical Circuits and Systems Conference (BioCAS), 2011.

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 Co-chair:

IEEE Northeast Workshop on Circuits and Systems (NEWCAS), 2016.

External Advisory Board Member:

Department of Electrical Engineering, Rochester Institute of Technology, 2004-2010.

Technical Program Committee Member:

IEEE International Symposium on Circuits and Systems (ISCAS), 2016.

IEEE Biomedical Circuits and Systems Conference (BioCAS), 2007, 2008, 2011.

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 6<sup>th</sup> Electro/Information Technology Conference, 2006.

SPIE Bioengineered and Bioinspired Systems Conference, 2003, 2005.

ACM Great Lakes Symposium on VLSI (GLSVLSI), 2003.

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, 2015-2017.

IEEE Biomedical Circuits and Systems Conference (BioCAS), 2016.

IEEE 4<sup>th</sup> 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.

University/Department Committees Member:

Electronics Group, Chair, 2015-2017.

Graduate Matters Committee, 2014-2017.

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.

## BOOK CHAPTERS

- [BC3] D. Ho, O. Noor, U. Krull, G. Gulak, R. Genov, "CMOS Spectrally-Multiplexed FRET Contact Imaging Microsystem for DNA Analysis," in "Handbook of Bioelectronics: Directly Interfacing Electronics and Biological Systems," edited by S. Carrara and K. Iniewski, Cambridge University Press, 2015.
- [BC2] H. Bidhendi, H. Jafari, R. Genov, "Ultra-Wideband Imaging Systems for Breast Cancer Detection," in "Ultra-Wideband and 60 GHz Communications for Biomedical Applications," edited by M. R. Yuce, Springer, pp. 83-103, 2014.
- [BC1] A. Olyaei, R. Genov, "CMOS Focal-Plane Spatially-Oversampling Computational Image Sensor," in "Circuits at the Nanoscale: Communications, Imaging, and Sensing," edited by K. Iniewski, CRC Press, pp. 521-538, 2008.

## REFEREED JOURNAL PUBLICATIONS

- [J44] G. O'Leary, D. Groppe, T. Valiante, N. Verma, R. Genov, "NURIP: Neural Interface Processor for Brain State Classification and Programmable-Waveform Neurostimulation," *subm. IEEE Journal of Solid-State Circuits*, 2018. **(Invited, special issue on best papers of IEEE ISSCC'18 Conference)**
- [J43] H. Kassiri, F. D. Chen, M. T. Salam, M. Chang, B. Vatankhahghadim, P. Carlen, T. A. Valiante, R. Genov, "Arbitrary-Waveform Electro-Optical Intracranial Neurostimulator with Load-Adaptive High-Voltage Compliance," major rev., *IEEE Transactions on Neural Systems & Rehabilitation Engineering*, 2018.
- [J42] W. Liu, A. Feyzi, N. Sarhangnejad, G. Gulak, R. Genov, "Super-resolution Line Scan Image Sensor for Multimodal Microscopy," *IEEE Transactions on Biomedical Circuits and Systems*, 2018.
- [J41] H. Kassiri, M. T. Salam, M. R. Pazhouhandeh, N. Soltani, J. L. Perez Velazquez, P. L. Carlen, R. Genov, "Rail-to-Rail-Input Dual-Radio 64-channel Closed-Loop Neurostimulator," *IEEE Journal of Solid-State Circuits*, Vol. 52, No. 11, pp. 2793 - 2810, Oct. 2017. **(Invited, special issue on best papers of IEEE ISSCC'17 Conference)**
- [J40] H. Kassiri, S. Tonekaboni, M. T. Salam, N. Soltani, K. Abdelhalim, J. L. Perez Velazquez, R. Genov, "Closed-Loop Neurostimulators: A Survey and a Seizure-Predicting Design Example for Intractable Epilepsy Treatment," *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 11, No. 5, pp. 1026-1040, Oct. 2017. **(Invited, special issue on best papers of IEEE ISCAS'16 Conference)**
- [J39] M. T. Salam, G. Montandon, R. Genov, J. L. Perez Velazquez, O. Dedvinsky, M. Del Campo, P. L. Carlen, "Mortality With Brainstem Seizures From Focal 4-AP Induced Recurrent Hippocampal Seizures," *Epilepsia*, Vol. 58, No. 9, pp. 1637-1644, Sep. 2017.
- [J38] T. C. Millar, N. Sarhangnejad, N. Katic, K. N. Kutulakos, R. Genov, "The Effect of Pinned-Photodiode Shape on Time-of-Flight Demodulation Contrast," *IEEE Transactions on Electron Devices*, Vol. 64, No. 5, pp. 2244-2250, Mar. 2017.
- [J37] H. Kassiri, M. T. Salam, J. L. Perez Velazquez, R. Genov, "Brain Synchrony-Contingent Neurostimulator for Treatment of Drug-Resistant Epilepsy," in "Seizure detection and neuromodulation: A summary of data presented at the XIII conference on new antiepileptic drug and

- devices (EILAT XIII),” edited by M. Bialer, et. al., *Epilepsy Research*, Vol. 130, pp. 34-36, Feb. 2017. **(Invited)**
- [J36] H. Kassiri, A. Chemparathy, M. T. Salam, R. Boyce, A. Adamantidis, R. Genov, “Electronic Sleep Stage Classifiers: A Survey and VLSI Design Methodology,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 11, No. 1, pp. 177-188, Feb. 2017.
- [J35] A. Bagheri, M. T. Salam, J. L. Perez Velazquez, R. Genov, “Low-frequency Noise and Offset Rejection in DC-Coupled Neural Amplifiers: A Review and Digitally-Assisted Design Tutorial,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 11, No. 1, pp. 161-176, Feb. 2017.
- [J34] H. Li, X. Liu, L. Li, X. Mu, R. Genov, A. J. Mason, “CMOS Electrochemical Instrumentation for Biosensor Microsystems: A Review,” *Sensors*, MDPI, Vol. 17, No. 1, Jan. 2017.
- [J33] R. Machadoa, N. Soltani, S. Dufour, M. T. Salam, P. Carlen, R. Genov, M. Thompson, “Biofouling-Resistant Impedimetric Sensor for Array High-Resolution Extracellular Potassium Monitoring in the Brain,” *Biosensors*, MDPI, Vol. 6, No. 4, Oct. 2016.
- [J32] N. Soltani, M. S. Aliroteh, M. T. Salam, J. L. Perez Velazquez, R. Genov, “Low-Radiation Cellular Inductive Powering of Rodent Wireless Brain Interfaces: Methodology and Design Guide,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 10, No. 4, pp. 920-932, Aug. 2016.
- [J31] M. T. Salam, J. L. Perez Velazquez, R. Genov, “Seizure Suppression Efficacy of Closed-loop Versus Open-loop Deep Brain Stimulation in a Rodent Model of Epilepsy,” *IEEE Transactions on Neural Systems & Rehabilitation Engineering*, Vol. 24, No. 6, pp. 710-719, June 2016.
- [J30] H. Kassiri, A. Bagheri, N. Soltani, K. Abdelhalim, H. Jafari, M. T. Salam, J. L. Perez Velazquez and R. Genov, “Battery-Less Tri-Band-Radio Neuro-Monitor and Responsive Neuro-Stimulator for Diagnostics and Treatment of Neurological Disorders,” *IEEE Journal of Solid-State Circuits*, Vol. 51, No. 5, pp. 1274-1289, May 2016.
- [J29] M. T. Salam, H. Kassiri, R. Genov, J. L. Perez Velazquez, “Rapid Brief Feedback Intracerebral Stimulation Based on Real-time Desynchronization Detection Preceding Seizures Stops the Generation of Convulsive Paroxysms,” Vol. 56, No. 8, pp. 1227-1238, *Epilepsia*, Aug. 2015.
- [J28] R. Shulyzki, K. Abdelhalim, A. Bagheri, M. T. Salam, C. M. Florez, J. L. Perez Velazquez, P. L. Carlen, R. Genov, “320-Channel Active Probe for High-Resolution Neuromonitoring and Responsive Neurostimulation,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 9, No. 1, pp. 34-49, Feb. 2015. **(IEEE Transactions on Biomedical Circuits and Systems Best Paper Award)**.
- [J27] S. R. I. Gabran, M. T. Salam, J. Dian, Y. El-Hayek, J. L. Perez Velazquez, P. L. Carlen, R. Genov, M. M. A. Salama, R. R. Mansour, “3-D Flexible Nano-Textured High-Density Microelectrode Arrays for High-Performance Neuro-Monitoring and Neuro-Stimulation,” *IEEE Transactions on Neural Systems & Rehabilitation Engineering*, Vol. 22, No. 5, pp. 1072-1082, Sept. 2014.
- [J26] H. Jafari, L. Soleymani, K. Abdelhalim, E. H. Sargent, S. O. Kelley, R. Genov, “Nanostructured CMOS Wireless Ultra-Wideband Label-Free PCR-Free DNA Analysis SoC,” *IEEE Journal of Solid-State Circuits*, Vol. 49, No. 5, pp. 1223-1241, May 2014.
- [J25] S. R. I. Gabran, M. T. Salam, J. Dian, Y. El-Hayek, J. L. Perez Velazquez, R. Genov, P. L. Carlen, M. M. A. Salama, R. R. Mansour, “High-Density Intracortical Microelectrode Arrays With Multiple Metallization Layers for Fine-Resolution Neuromonitoring and Neurostimulation,” *IEEE Transactions on Neural Systems & Rehabilitation Engineering*, Vol. 21, No. 6, pp. 869-879, Nov. 2013.
- [J24] D. Ho, G. Gulak, R. Genov, “CMOS Tunable-Wavelength Multi-Color Photogate Sensor,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 7, No. 6, pp. 805-819, Dec. 2013.
- [J23] D. Ho, O. Noor, U. Krull, G. Gulak, R. Genov, “CMOS Spectrally-multiplexed FRET-on-a-chip for DNA Analysis,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 7, No. 5, pp. 643-654, Oct. 2013.
- [J22] A. Bagheri, S. R. I. Gabran, M. T. Salam, J. L. Perez Velazquez, R. R. Mansour, M. M. A. Salama, R. Genov, “Massively-Parallel Neuromonitoring and Neurostimulation Rodent Headset with



- Nanotextured Flexible Microelectrodes,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 7, No. 5, pp. 601-609, Oct. 2013. **(Invited, special issue on best papers of IEEE BioCAS’12 Conference)**
- [J21] K. Abdelhalim, H. Jafari, L. Kokarovtseva, J. L. Perez Velazquez, R. Genov, “64-channel UWB Wireless Neural Vector Analyzer SOC with a Closed-Loop Phase Synchrony-Triggered Neurostimulator,” *IEEE Journal of Solid-State Circuits*, Vol. 48, No. 10, pp. 2494-2510, Oct. 2013.
- [J20] K. Abdelhalim, L. Kokarovtseva, J. L. Perez Velazquez, R. Genov, “915-MHz FSK/OOK Wireless Neural Recording SoC with 64 Mixed-Signal FIR Filters,” *IEEE Journal of Solid-State Circuits*, Vol. 48, No. 10, 2478-2493, Oct. 2013.
- [J19] H. Jafari, R. Genov, “Chopper-Stabilized Bidirectional Current Acquisition Circuits for Electrochemical Amperometric Biosensors,” *IEEE Transactions on Circuits and Systems – I*, Vol. 60, No. 5, pp. 1149-1157, May 2013. **(Invited, special issue of IEEE TCAS-I on best papers of IEEE ISCAS’12)**
- [J18] D. Ho, O. Noor, U. Krull, G. Gulak, R. Genov, “CMOS Tunable-Color Image Sensor with Dual-ADC Shot-Noise-Aware Dynamic Range Extension,” *IEEE Transactions on Circuits and Systems – I*, Vol. 60, No. 8, pp. 2116-2129, Aug. 2013.
- [J17] M. Nazari, H. Jafari, L. Leng, A. Guenther, R. Genov, “CMOS Neurotransmitter Microarray: 96-Channel Integrated Potentiostat with On-die Microsensors,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 7, No. 3, pp. 338-348, June 2013. **(Also invited to special section of IEEE TCAS-I on best papers of IEEE CICC’10)**
- [J16] H. Jafari, L. Soleymani, R. Genov, “16-Channel CMOS Impedance Spectroscopy DNA Analyzer with Dual-Slope Multiplying ADCs,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 6, No. 5, pp. 468-478, 2012. **(Invited, special issue on best papers of IEEE BioCAS’11 Conference)**
- [J15] R. Singh, L. Leng, A. Guenther, R. Genov, “A CMOS-Microfluidic Chemiluminescence Contact Imaging Microsystem,” *IEEE Journal of Solid-State Circuits*, Vol. 47, No. 11, pp. 2822-2833, 2012.
- [J14] R. Karakiewicz, R. Genov, G. Cauwenberghs, “1.1 TMACS/mW Fine-Grained Stochastic Resonant Charge-Recycling Array Processor,” *IEEE Sensors Journal*, Vol. 12, No. 4, pp. 785-792, 2012. **(Special issue on design methods for low power arrays)**
- [J13] K. Abdelhalim, V. Smolyakov, R. Genov, “A Phase-Synchronization Epileptic Seizure Detector VLSI Architecture,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 5, No. 5, pp. 430-438, 2011. **(Invited, special issue on best papers of IEEE BioCAS’10 Conference)**
- [J12] F. Shahrokhi, K. Abdelhalim, D. Serletis, P. Carlen, R. Genov, “128-Channel Fully Differential Digital Integrated Neural Recording and Stimulation Interface,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 4, No. 3, pp. 149-161, 2010. **(Invited, special issue on best papers of IEEE ISCAS’09)**
- [J11] R. Singh, D. Ho, A. Nilchi, G. Gulak, P. Yau, R. Genov, “A CMOS/Thin-Film Fluorescence Contact Imaging Microsystem for DNA Analysis,” *IEEE Transactions on Circuits and Systems I: Regular Papers*, Vol. 57, No. 5, pp. 1029-1038, May 2010. **(Invited, special issue on best papers of IEEE ISCAS’09)**
- [J10] A. Nilchi, J. Aziz, R. Genov, “Focal-Plane Algorithmically-Multiplying CMOS Computational Image Sensor,” *IEEE Journal of Solid-State Circuits*, Vol. 44, No. 6, pp. 1829-1839, June 2009. **(Also invited to IEEE TCAS-I special issue on best papers of IEEE ISCAS’09)**
- [J9] J. Aziz, K. Abdelhalim, R. Shulyzki, R. Genov, B. Bardakjian, M. Derchansky, D. Serletis, P. Carlen, “256-Channel Neural Recording and Delta Compression Microsystem with 3D Electrodes,” *IEEE Journal of Solid-State Circuits*, Vol. 44, No. 3, pp. 995-1005, March 2009.
- [J8] R. Karakiewicz, R. Genov, G. Cauwenberghs, “480-GMACS/mW Resonant Adiabatic Mixed-Signal Processor Array for Charge-Based Pattern Recognition,” *IEEE Journal of Solid-State Circuits*, Vol. 42, No. 11, pp. 2573-2584, Nov. 2007.
- [J7] J. Aziz, R. Genov, B. Bardakjian, M. Derchansky, P. Carlen, “Brain-Silicon Interface for High-

- Resolution In Vitro Neural Recording,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 1, No. 1, pp. 56-62, March 2007.
- [J6] A. Olyaei, R. Genov, “Focal-Plane Spatially-Oversampling CMOS Image Compression Sensor,” *IEEE Transactions on Circuits and Systems I: Regular Papers*, Vol. 54, No. 1, pp. 26-34, Jan. 2007.
- [J5] R. Genov, M. Stanacevic, M. Naware, G. Cauwenberghs, N. Thakor, “16-Channel Integrated Potentiostat for Distributed Neurochemical Sensing,” *IEEE Transactions on Circuits and Systems I: Regular Papers*, Vol. 53, No. 11, pp. 2371-2376, Nov. 2006. **(Special issue on advances in life science systems and applications)**
- [J4] R. Genov, G. Cauwenberghs, “Dynamic MOS Sigmoid Array Folding Analog-to-Digital Conversion,” *IEEE Transactions on Circuits and Systems I: Regular Papers*, Vol. 51, No. 1, pp. 182-186, Jan. 2004. **(Special issue on advances on analog-to-digital and digital-to-analog converters)**
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- [J1] R. Genov, G. Cauwenberghs, “Charge-Mode Parallel Architecture for Matrix-Vector Multiplication,” *IEEE Transactions on Circuits and Systems II: Analog and Digital Signal Processing*, Vol. 48, No. 10, pp. 930-936, Oct. 2001. **(Invited, special section on best student paper awards of IEEE MWSCAS’00)**

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- [C76] M. R. Pazhouhandeh, H. Kassiri, A. Shoukry, I. Weisspapir, P. Carlen, R. Genov, “Artifact-Tolerant Opamp-less Delta-Modulated Bidirectional Neuro-Interface,” *Symposium on VLSI Circuits*, Honolulu, June 2018.
- [C75] N. Ghoroghchian, S. C. Draper and R. Genov, “A Hierarchical Graph Signal Processing Approach to Inference from Spatiotemporal Signals,” *Biennial Symposium on Communications*, Toronto, June 2018.
- [C74] G. O’Leary, M. R. Pazhouhandeh, D. Groppe, T. Valiante, N. Verma, R. Genov, “A Recursive-memory Brain State Classifier with 32-Channel Track-and-Zoom  $\Delta\Sigma$  ADC and Charge-balanced Programmable-waveform Neurostimulators,” *IEEE International Solid-State Circuits Conference (ISSCC’2018)*, San Francisco, Feb. 2018.
- [C73] M. ElAnsary, N. Soltani, H. Kassiri, R. Machadoa, S. Dufour, P. Carlen, M. Thompson, R. Genov, “50nW 5kHz-BW Opamp-less  $\Delta\Sigma$  Impedance Analyzer for Brain Neurochemistry Monitoring,” *IEEE International Solid-State Circuits Conference (ISSCC’2018)*, San Francisco, Feb. 2018.
- [C72] G. O’Leary, A. Abraham, A. Kamath, D. Groppe, T. Valiante, R. Genov, “Machine Learning Microserver for Neuromodulation Device Training,” *IEEE Biomedical Circuits and Systems Conference (BioCAS’2017)*, Turin, Oct. 2017.
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- [C70] G. O’Leary, T. Valiante, R. Genov, “Low-latency VLSI Architecture for Neural Cross-frequency Coupling Analysis,” *IEEE Engineering in Medicine and Biology Conference (EMBC’2017)*, Jeju

Island, July 2017.

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- [C67] H. Kassiri, M. R. Pazhouhandeh, M. T. Salam, J. L. P. Velazquez, R. Genov, "All-Wireless 64-channel 0.013mm<sup>2</sup>/ch Closed-Loop Neurostimulator with Rail-to-Rail DC Offset Removal," *IEEE International Solid-State Circuits Conference (ISSCC'2017)*, San Francisco, Feb. 2017.
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- [C56] K. Abdelhalim, H. M. Jafari, L. Kokarovtseva, J. L. Perez Velazquez, R. Genov, "Neural Synchrony-Monitoring Wireless Brain Implant for Intractable Epilepsy Neuromodulation," *Neural Engineering Conference*, San Diego, Nov. 2013.
- [C55] N. Soltani, M. S. Aliroteh, R. Genov, "Cellular Inductive Powering System for Weakly-Linked Resonant Rodent Implants," *IEEE Biomedical Circuits and Systems Conference (BioCAS'2013)*, Rotterdam, Oct. 2013.
- [C54] H. Kassiri, K. Abdelhalim, R. Genov, "Low-Distortion Super-GOhm Subthreshold-MOS

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- [C53] A. Vidwans, K. Abdelhalim, R. Genov, “Similarity-Index Early Seizure Detector VLSI Architecture,” *IEEE Int. Symp. on Circuits and Systems (ISCAS'2013)*, Beijing, China, May 2013.
- [C52] A. Bagheri, S. R. I. Gabran, M. T. Salam, J. L. Perez Velazquez, R. R. Mansour, M. M. A. Salama, R. Genov, “1024-Channel-Scalable Wireless Neuromonitoring and Neurostimulation Rodent Headset with Nanotextured Flexible Microelectrodes,” *IEEE Biomedical Circuits and Systems Conference (BioCAS'2012)*, Hsinchu, Taiwan, Nov. 2012.
- [C51] K. Abdelhalim, H. Jafari, L. Kokarovtseva, J. L. Perez Velazquez, R. Genov, “64-Channel UWB Wireless Neural Vector Analyzer and Phase Synchrony-Triggered Stimulator SoC,” *IEEE European Solid-State Circuits Conference (ESSCIRC'2012)*, Bordeaux, Sept. 2012.
- [C50] H. Jafari, L. Soleymani, K. Abdelhalim, E. Sargent, S. Kelley and R. Genov, “Nanostructured CMOS Wireless Ultra-Wideband Label-free DNA Analysis SoC,” *IEEE Symposium on VLSI Circuits, Honolulu, June 2012*.
- [C49] K. Abdelhalim, R. Genov, “Compact Chopper-Stabilized Neural Amplifier with Low-Distortion High-Pass Filter in 0.13 $\mu$ m CMOS,” *IEEE Int. Symp. on Circuits and Systems (ISCAS'2012)*, Seoul, 2012.
- [C48] H. Jafari, R. Genov, “Bidirectional Current Conveyer with Chopper Stabilization and Dynamic Element Matching,” *IEEE Int. Symp. on Circuits and Systems (ISCAS'2012)*, Seoul, 2012.
- [C47] D. Ho, M. O. Noor, U. J. Krull, G. Gulak, R. Genov, “Single-Filter Multi-Color CMOS Fluorescent Contact Sensing Microsystem,” *IEEE Int. Symp. on Circuits and Systems (ISCAS'2012)*, Seoul, 2012.
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- [C45] H. Jafari, R. Genov, “CMOS Impedance Spectrum Analyzer with Dual-Slope Multiplying ADC,” *IEEE Biomedical Circuits and Systems Conference (BioCAS'2011)*, San Diego, Nov. 2011 (**Best Paper Award, one conference-wide award**).
- [C44] K. Abdelhalim, R. Genov, “915-MHz Wireless 64-Channel Neural Recording SoC with Programmable Mixed-Signal FIR Filters,” *IEEE European Solid-State Circuits Conference (ESSCIRC'2011)*, Sept. 2011.
- [C43] D. Ho, G. Gulak, R. Genov, “CMOS Electric Field-Modulated Color Sensor,” *IEEE Custom Integrated Circuits Conference (CICC'2011)*, Sept. 2011.
- [C42] R. Shulyzki, K. Abdelhalim, A. Bagheri, C.M. Florez, P.L. Carlen, R. Genov, “256-site Active Neural Probe and 64-channel Responsive Cortical Stimulator,” *IEEE Custom Integrated Circuits Conference (CICC'2011)*, Sept. 2011.
- [C41] K. Abdelhalim, R. Genov, “An Area and Power-Efficient Stimulator for Integrated Neural Recording and Stimulation Arrays,” *IEEE Int. Symp. on Circuits and Systems (ISCAS'2011)*, May 2011.
- [C40] K. Abdelhalim, V. Smolyakov, R. Shulyzki, J. Aziz, D. Serletis, P. Carlen, R. Genov, “VLSI Multivariate Phase Synchronization Epileptic Seizure Detector,” *IEEE Conf. on Neural Engineering*, Apr. 2011.
- [C39] K. Abdelhalim, V. Smolyakov, R. Genov, “A Phase Synchronization and Magnitude Processor VLSI Architecture for Adaptive Neural Stimulation,” *IEEE Biomedical Circuits and Systems Conference (BioCAS'2010)*, Paphos, Cyprus, Nov. 2010 (**Best Student Paper Award finalist**).
- [C38] R. Singh, K. Abdelhalim, R. Genov, “A Compact Parasitic-Insensitive Dual-Frequency Delta-Sigma Modulated CMOS Capacitive Sensor,” *IEEE Biomedical Circuits and Systems Conference (BioCAS'2010)*, Paphos, Cyprus, Nov. 2010.
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- [C36] R. Shulyzki, K. Abdelhalim, R. Genov, "CMOS Current-Copying Neural Stimulator with OTA Sharing," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2010)*, May 2010.
- [C35] R. Singh, L. Leng, A. Guenther, R. Genov, "A Hybrid CMOS-Microfluidic Contact Imaging Microsystem," *SPIE Optics and Photonics* Aug. 1-6, 2009. **(Invited)**
- [C34] A. Nilchi, J. Aziz, R. Genov, "CMOS Image Compression Sensor with Algorithmically-Multiplying ADCs," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2009)*, pp. 1497-1500, May 2009. **(Best Paper on Sensory Systems, and Best Student Paper Awards)**
- [C33] F. Shahrokhi, K. Abdelhalim, R. Genov, "128-Channel Fully Differential Digital Neural Recording and Stimulation Interface," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2009)*, pp. 1249-1252, May 2009. **(Best Student Paper Contest finalist)**
- [C32] R. Singh, D. Ho, A. Nilchi, R. Genov, G. Gulak, "A Hybrid Thin-Film/CMOS Fluorescence Contact Imager," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2009)*, pp. 2437-2440, May 2009.
- [C31] M. Nazari, R. Genov, "A Fully Differential CMOS Potentiostat," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2009)*, pp. 2177-2180, May 2009.
- [C30] R. Singh, R. Genov, R. Kotamraju, B. Mazhari, "Multi-Step Binary-Weighted Capacitive Digital-to-Analog Converter Architecture," *IEEE Midwest Symposium on Circuits and Systems (MWSCAS'08)*, Knoxville, Tennessee, Aug. 10-13, 2008.
- [C29] R. Karakiewicz, R. Genov, G. Cauwenberghs, "1.1 TMACS/mW Load-Balanced Resonant Charge-Recycling Array Processor," *IEEE Custom Integrated Circuits Conference (CICC'2007)*, Sept. 2007.
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- [C26] A. Olyaei, R. Genov, "ViPro: Focal-Plane Spatially-Oversampling CMOS Image Compression Sensor," *IEEE Custom Integrated Circuits Conference (CICC'2006)*, Sept. 2006.
- [C25] J. N. Y. Aziz, R. Karakiewicz, R. Genov, B. L. Bardakjian, M. Derchansky, P. L. Carlen, "Towards Real-Time In-Implant Epileptic Seizure Prediction," *IEEE Engineering in Medicine and Biology Conference (EMBC'2006)*, Sept. 2006.
- [C24] R. Karakiewicz, R. Genov, G. Cauwenberghs, "175 GMACS/mW Charge-Mode Adiabatic Mixed-Signal Array Processor," *IEEE Symposium on VLSI Circuits*, June 2006.
- [C23] J. N. Y. Aziz, R. Karakiewicz, R. Genov, B. L. Bardakjian, M. Derchansky, P. L. Carlen, "Real-Time Seizure Monitoring and Spectral Analysis Microsystem," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2006)*, May 2006.
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- [C21] J. N. Y. Aziz, R. Genov, "Electro-Chemical Multi-Channel Integrated Neural Interface Technologies," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2006)*, May 2006.
- [C20] A. Olyaei, R. Genov, "Algorithmic Delta-Sigma Modulated FIR Filter," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2006)*, May 2006.
- [C19] J. Aziz, R. Genov, "Multi-Channel Integrated Neural Interfaces for Distributed Electro-Chemical Sensing," *IEEE Midwest Symposium on Circuits and Systems (MWSCAS'05)*, Cincinnati, Ohio, Aug. 7-10, 2005.
- [C18] A. Olyaei, R. Genov, "Focal-Plane CMOS Wavelet Feature Extraction for Real-Time Pattern Recognition," *SPIE Photonics North*, Toronto, Canada, Sept. 12-14, 2005.
- [C17] A. Olyaei, R. Genov, "Mixed-Signal CMOS Haar Wavelet Compression Imager Architecture," *IEEE Midwest Symposium on Circuits and Systems (MWSCAS'05)*, Cincinnati, Ohio, Aug. 7-10,

2005.

- [C16] R. Karakiewicz, R. Genov, "Minimal Activity Mixed-Signal VLSI Architecture for Real-Time Linear Transforms in Video," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2005)*, Kobe, Japan, May 23-26, 2005.
- [C15] M. Naware, A. Rege, R. Genov, M. Stanacevic, G. Cauwenberghs, N. Thakor, "Integrated Multi-Electrode Fluidic Nitric-Oxide Sensor and VLSI Potentiostat Array," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2004)*, Vancouver, Canada, May 26-29, 2004.
- [C14] R. Genov, M. Stanacevic, M. Naware, G. Cauwenberghs, N. Thakor, "VLSI Multi-Channel Track-and-Hold Potentiostat," *Microtechnologies for the New Millennium, Bioengineered and Bioinspired Systems*, Proc. SPIE vol. 5119, May 2003.
- [C13] R. Genov, G. Cauwenberghs, "Algorithmic Partial Analog-to-Digital Conversion in Mixed-Signal Array Processors," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2003)*, Bangkok, Thailand, May 25-28, 2003.
- [C12] R. Genov, G. Cauwenberghs, G. Mulliken, F. Adil, "A 5.9mW 6.5GMACS CID/DRAM Array Processor," *IEEE European Solid-State Circuits Conference (ESSCIRC'2002)*, Florence, Italy, Sept. 24-26, 2002.
- [C11] R. Genov, G. Cauwenberghs, "Kerneltron: Support Vector 'Machine' in Silicon," *SVM'2002*, Lecture Notes in Computer Science, Niagara Falls, ON, Aug. 10, 2002.
- [C10] G. Mulliken, F. Adil, G. Cauwenberghs, R. Genov, "Delta-Sigma Algorithmic Analog-to-Digital Conversion," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2002)*, Phoenix, AZ, May 26-29, 2002.
- [C9] R. Genov, G. Cauwenberghs, "Charge-Based MOS Correlated Double Sampling Comparator and Folding Circuit," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2002)*, Phoenix, AZ, May 26-29, 2002.
- [C8] G. Cauwenberghs, R. T. Edwards, Y. Deng, R. Genov, D. Lemonds, "Neuromorphic Processor for Real-Time Biosonar Object Detection," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'2002)*, Orlando, FL, May 13-17, 2002.
- [C7] R. Genov, G. Cauwenberghs, "Stochastic Mixed-Signal VLSI Architecture for High-Dimensional Kernel Machines," *Advances in Neural Information Processing Systems (NIPS'2001)*, Cambridge, MA: MIT Press, vol. 14, 2002.
- [C6] R. Genov, G. Cauwenberghs, "CID/DRAM Mixed-Signal Parallel Distributed Array Processor," *IEEE 14th International ASIC/SOC Conference (ASIC/SOC'2001)*, Washington, DC, Sept. 12-15, 2001.
- [C5] R. Genov, G. Cauwenberghs, "Massively Parallel Inner-Product Array Processor," *IEEE Int. Joint Conference on Neural Networks (IJCNN'2001)*, Washington, DC, July 15-19, 2001.
- [C4] R. Genov, G. Cauwenberghs, "Analog Array Processor with Digital Resolution Enhancement and Offset Compensation," *Conference on Information Sciences and Systems (CISS'2001)*, Baltimore, MD, March 21-23, 2001.
- [C3] R. Genov, G. Cauwenberghs, "Charge-Mode Parallel Architecture for Matrix-Vector Multiplication," *43rd IEEE Midwest Symposium on Circuits and Systems (MWSCAS'2000)*, Lansing, MI, Aug. 8-11, 2000. (**Best Student Paper Award, 3<sup>rd</sup> place**)
- [C2] R. Genov, S. Madhavapeddi, G. Cauwenberghs, "Learning to Navigate from Limited Sensory Input: Experiments with the Khepera Microrobot," *IEEE International Joint Conference on Neural Networks (IJCNN'99)*, Washington, DC, vol. 3, pp. 2061-2064, 1999. (**Best Presentation Award**)
- [C1] R. Genov, G. Cauwenberghs, "16-Channel Single-Chip Current-Mode Track-and-Hold Acquisition System with 100 dB Dynamic Range," *IEEE International Symposium on Circuits and Systems (ISCAS'99)*, Orlando, FL, vol. 6, pp. 350-353, 1999. (**Best Student Paper Contest finalist**)

#### NON-REFEREED CONFERENCE AND WORKSHOP PUBLICATIONS

- [NC3] A. Olyaei, R. Genov, "CMOS Wavelet Compression Imager Architecture," *IEEE CAS*

*Emerging Technologies Workshop*, St. Petersburg, Russia, June 23-24, 2005.

- [NC2] R. Genov, "A 1GMACS/mW Mixed-Signal Differential-Charge CID/DRAM Processor," *IEEE Int. Conf. on Circuits and Systems for Communications (ICCSC'2004)*, Moscow, Russia, June 30 - July 2, 2004 (invited).
- [NC1] R. Genov, G. Cauwenberghs, "Embedded Dynamic Memory and Charge-Mode Logic for Parallel Array Processing," *5th World Multi-Conference on Systemics, Cybernetics and Informatics (SCI'2001)*, Orlando, FL, July 22-25, 2001.

## ABSTRACTS / POSTERS

- [A13] G. O'Leary, D. M. Groppe, T. A. Valiante, R. Genov, "Machine Learning-Based Responsive Brain Stimulation", subm. Society for Neuroscience, Nov. 2018.
- [A12] G. O'Leary, D. M. Groppe, T. A. Valiante, R. Genov, "Machine Learning-Based Responsive Brain Stimulation: An Epilepsy Clinical Trial", 12th Annual Canadian Neuroscience Meeting, May 2018.
- [A11] G. O'Leary, D. M. Groppe, T. A. Valiante, R. Genov, "Machine Learning Based Responsive Brain Stimulation: An Epilepsy Clinical Trial", Gallie Day, University of Toronto, May 2018.
- [A10] G. O'Leary, D. M. Groppe, T. A. Valiante, R. Genov, "Machine Learning Based Responsive Brain Stimulation: An Epilepsy Clinical Trial", Krembil Research Day, May 2018.
- [A9] G O'Leary, D. Groppe, T. A. Valiante, and Roman Genov, "Machine Learning Based Responsive Brain Stimulation: An Epilepsy Clinical Trial," 12<sup>th</sup> Canadian Association for Neuroscience Annual Meeting, May 2018.
- [A8] M. T. Salam, J. L. P. Velazquez, R. Genov, "Antiepileptic Effect using Brief Low- and High-frequency Closed-Loop Stimulation in Hippocampus for the Suppression of Acute and Chronic Seizures in Rodent Models of Epilepsy," International Conference on System Level Approaches to Neural Engineering, Barcelona, Sept. 2015.
- [A7] J. L. P. Velazquez, M. T. Salam, T. A. Valiante, R. Genov, "Control of pathological behaviours using feedback intracerebral stimulation: using the brain's own dynamics to control its activity," International Conference on System Level Approaches to Neural Engineering, Barcelona, Sept. 2015.
- [A6] M. T. Salam, W. Beneducci, R. Genov, T. A. Valiante, J. L. P. Velazquez, L. Zhang, "Desynchronization prior to seizures is a common feature of electrographic signals in acute and chronic seizure models in rodent and human temporal lobe epilepsy," Society for Neuroscience, Annual Meeting, Oct. 2015.
- [A5] M. T. Salam, G. Montandon, R. Genov, J. L. Perez Velazquez, P. Carlen, "Cardiorespiratory dysfunction due to the electrographic discharges propagation into brainstem," Society for Neuroscience, Annual Meeting, Oct. 2015.
- [A4] M. T. Salam, J. L. Perez Velazquez, R. Genov, "Effect of closed-loop and open-loop deep brain stimulation on chronic seizures control," World Congress on Medical Physics and Biomedical Engineering, Toronto, June 2015.
- [A3] J. L. Pérez Velázquez, R. F. Galán, V. Nenadovic, M. T. Salam, R. Genov, "Fluctuations in brain signals in health and pathology, International Workshop on Neurodynamics," July 14-17, Spain, 2014.
- [A2] M. T. Salam, G. Montandon, R. Genov, J. L. Perez Velazquez, P. Carlen, "New animal model of SUDEP: Brainstem ictal EEG is associated with respiratory arrest," Annual meeting of the American Epilepsy Society (AES), Dec. 2014.
- [A1] M. T. Salam, G. Montandon, R. Genov, J. L. Perez Velazquez, P. Carlen, "Brainstem electrographic discharges associated with respiratory arrest," Annual meeting of Canadian League Against Epilepsy, Oct. 2014.

**OTHER PUBLICATIONS**

- [O2] R. Genov, A Burdett, P Mercier, "Guest Editorial - Selected Papers from the 2014 IEEE International Solid-State Circuits Conference," *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 8, No. 6, pp. 753-754, Dec. 2014.
- [O1] R. Genov, "Massively Parallel Mixed-Signal VLSI Kernel Machines," Ph.D. Dissertation, Department of Electrical and Computer Engineering, The Johns Hopkins University, May 2003.

**MEDIA**

- [M8] "The 'Holy Grail' of epilepsy research: Neurosurgeon Dr. Taufik Valiante thinks an implanted electronic device could sense and stop seizures," by S. White, *The Krembil Research Institute Magazine* featured in *The Globe and Mail*. Based on an interview with Dr. Taufik Valiante and Prof. Roman Genov, Apr. 26, 2017.
- [M7] "Purple Day and the Future of Epilepsy Care," *University of Toronto Faculty of Medicine News*, Mar. 23, 2017.
- [M6] "Grads to Watch: Meet 16 Global Engineering Leaders," *University of Toronto Engineering News*, June 8, 2016. One of Genov's PhD students H. Kassiri was a participant in a research project: "Preventing seizures before they start." He was featured as one of the graduating Electrical Engineering leaders to watch.
- [M5] "Novel Devices, Technologies Provide Insights into Seizure Control, Surgical Targets," *American Epilepsy Society's 69th Annual Meeting News Release*, Dec. 5, 2015. Interview with Genov's postdoctoral fellow Dr. Tariqus Salam, reprinted by *Science Daily*, *Science Newsline*, *eScience News*, *AAAS EurikAlert*, and others.
- [M4] "Three Commercialization Fellowships Bring New U of T Engineering Research To Market," *University of Toronto Engineering News*, May 27, 2015. Two of Genov's PhD students, H. Kassiri and N. Soltani, were featured as winners of Heffernan Commercialization Fellowships for implantable chip that can anticipate and stop epileptic seizures.
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