

## 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**

Best Paper Award, IEEE International Symposium on Circuits and Systems, ISCAS (with H. Kassiri, the top Biomedical Circuits and Systems Technical Committee paper, 1687 submitted papers), 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, one of the highest ranked student papers, \$200 prize), 2010.

Best Student Paper Award nomination at IEEE Biomedical Circuits and Systems Conference, BioCAS (with K. Abdelhalim, top seven student 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 Circuits and Systems Society Sensory Systems Technical Committee (with A. Nilchi, the top paper), 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**

1<sup>st</sup> Rank in Collaborative Health Research Projects competition by Canadian Institutes of Health Research (out of 116 submitted proposals), 2016.

The MEMSCAP Microsystems Design Award (with A. Bagheri and S. Gabran, prize \$3,000), 2012.

Brian L. Barge Award for Excellence in Microsystems Integration (with H. Kassiri and N. Soltani, \$3,500 prize), 2012.

DALSA Corporation Award for Excellence in Microsystems Innovation (with A. Olyaei, \$3,000 prize), 2006 and (with K. Abdelhalim, \$3,000 prize) 2009.

Brian L. Barge Award for Excellence in Microsystems Integration (with H. Jafari, \$3,500 prize), 2008.

Canadian Institutes of Health Research (CIHR)/BioContact Next Generation Award (with M. Derchansky, \$2,000 prize), 2005.

**Provincial / Local**

Connaught Innovation Award (\$75,000), 2016.

Ontario Brain Institute Entrepreneur Award (with H. Kassiri, N. Soltani, \$50,000), 2015.

Heffernan/Co-Steel Innovation Commercialization Fellowship (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 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
“Patient-Specific Adaptive Closed-Loop Neurostimulation for Optimum Treatment of Intractable Epilepsy,” PI, Canadian Institutes of Health Research (CIHR), Collaborative Health Research Projects, 4/2016-3/2019.	\$77,400	\$232,200
“Computational and Optical Processing Architectures for Next-Generation	\$50,500	\$151,500

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.	\$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), Strategic Projects, 10/2010-09/2013.	\$75,150	\$225,450
“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-	\$20,850	\$83,400

04/2007.

“Mixed-Signal VLSI Circuits and Systems,” PI, Connaught Foundation, \$10,000 \$10,000  
10/2002.

“Mixed-Signal VLSI Circuits and Systems,” PI, University of Toronto, \$100,000 \$100,000  
ECE Dept., 10/2002.

**ADVISEES SUPERVISION SUMMARY**

(Data as of August 31, 2015)	No. of Advisees Completed		No. of Advisees in Progress		Sub-total
	Supervised	Co-supervised	Supervised	Co-supervised	
Undergraduate summer students	29	0	0	0	26
B.A.Sc. theses / projects	48	3	0	0	51
M.Eng. students	5	0	1	0	6
M.A.Sc. students	9	1	0	0	10
Ph.D. students	4	1	3	0	8
Post-doctoral fellows	0	1	0	2	3
Sub-total	95	6	8	2	

**FORMER GRADUATE RESEARCH ADVISEES****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: Computational 3-D Camera Design

**MASc Students**

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

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

Currently at: Senior IC 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

Currently at: IC design engineer at Intel/Vsemi, 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

Currently at: IC design engineer at Broadcom Corporation, Irvine, CA

Alireza Nilchi, M.A.Sc. Degree, 09/2005-11/2007.

Thesis: Focal-Plane CMOS Algorithmically-Multiplying Computational Image Sensor

Currently: PhD student at University of Toronto, Electronics Group

Meisam Nazari, M.A.Sc. Degree, 01/2006-06/2008.

Thesis: CMOS Wide-Dynamic-Range High-Throughput Potentiostat

Currently: PhD student at California Institute of Technology

Ritu Raj Singh, M.A.Sc. Degree, 09/2006-11/2008.

Thesis: Luminescence Contact Imaging Microsystems

Currently: PhD student at University of Texas, Austin

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

Currently: IC design engineer at Ignis Innovation Inc, Waterloo, Ontario

Arezu Bagheri, M.A.Sc. Degree, 09/2010-09/2013.

Thesis: High-Integration-Density Neural Interfaces for High-Spatial-Resolution Intracranial EEG Monitoring

Currently: IC design engineer at Semtech/Snowbush, Toronto, Ontario

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

### 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

Currently: IC design engineer at Broadcom Inc, Irvine, 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

Currently: IC design engineer at Semtech/Snowbush, Toronto, Ontario

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: OBI Fellow

Nima Soltani, Ph.D. Degree, 09/2011-12/2015.

Thesis: Inductively-Powered Implantable Integrated Circuits for Amperometric Brain Chemistry

Currently: OBI Fellow

### Post-Doctoral Fellows

Tariq Salam, 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

Hyunjoong Lee, Post-Doctoral Fellow, 09/2014-01/2016 (co-supervised with Prof. Kutulakos, 50%).

Project: CMOS Structured-Light Computational Imagers

Enver Kilinc, Post-Doctoral Fellow, 03/2015-02/2016 (co-supervised with Prof. Gulak, 50%).

Project: Implantable Transceiver and Antenna Design

### **CURRENT GRADUATE RESEARCH ADVISEES**

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

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

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

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

Wilfred Cho, Candidate for M.A.Sc. Degree, 09/2015-current.

Nikola Katic, Post-Doctoral Fellow, 04/2016-current.

Asish Abraham, Candidate for M.Eng. Degree, 04/2016-current.

Goutham Palaniappan, Candidate for M.Eng. Degree, 04/2016-current.

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

### **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 Seyedaliroteh	(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)
	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)

#### 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 student)
	Chengzhi (Winston) Liu	(summer student)
	T. Cole Millar	(summer 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	(volunteer research student)
	Kamyar Ghofrani	(volunteer research student from U. of Waterloo)
	R. Andrei Romero Alvarez	(volunteer research student from Department of CS)
	Ji Tong (Michael) Yin	(volunteer research student, from Department of EngSci)
	Terrence Cole Millar	(summer intern)
	Nikita Gusev	(NSERC USRA summer student)
	Winston Liu	(volunteer research student)
	Vincent Lo	(volunteer research student)
	Nafis Ahbab	(volunteer research student)
	Anas Ahmed	(volunteer research student)
	Sanjana Seerala	(volunteer research student)

## 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).
- “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).
- “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).
- “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, 2012, 2013, 2014, 2015, 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

- “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 Section on papers from the International Solid-State Circuits Conference (ISSCC), 2014-2016.

### 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, Publications and Conferences Committees, 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, 2014-2016.

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, Media Liaison, 2015-2016.

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, 2015-2016.

Graduate Matters Committee, 2014-2016.

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

[J37] R. Machado, N. Soltani, S. Dufour, M. T. Salam, P. Carlen, R. Genov, M. Thompson, "Antifouling Impedimetric Sensor for the Spatial Measurement of Potassium During Epileptic Seizures," subm., *Biosensors and Bioelectronics*, 2016.

[J36] N. Soltani, R. Genov, "Low-Absorption Inductive Powering Links," under major rev. *IEEE Transactions on Biomedical Circuits and Systems*, 2016.

[J35] H. Kassiri, F. D. Chen, M. T. Salam, M. Chang, B. Vatankhah, P. L. Carlen, T. A. Valiante, R. Genov, "Arbitrary-Waveform Electro-Optical Intracranial Neurostimulator with Load-Adaptive High-Voltage Compliance," under major rev. *IEEE Transactions on Biomedical Circuits and Systems*, 2016.

[J34] 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*, 2016.

[J33] 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*, 2016.

[J32] 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*, 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*, 2016.

[J30] H. Kassiri, A. Bagheri, N. Soltani, K. Abdelhalim, H. Jafari, M. T. Salam, J. L. P. 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, 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*, 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.
- [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)**
- [J3] R. Genov, S. Chakrabartty, G. Cauwenberghs, "Silicon Support Vector Machine with On-Line Learning," *International Journal of Pattern Recognition and Artificial Intelligence*, Vol. 17, No. 3, pp. 385-404, 2003. **(Invited, special issue on best papers of SVM'02)**
- [J2] R. Genov, G. Cauwenberghs, "Kerneltron: Support Vector 'Machine' in Silicon," *IEEE Transactions on Neural Networks*, Vol. 14, No. 5, pp. 1426-1434, Sept. 2003. **(Special issue on neural networks hardware implementations)**
- [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)**

**REFEREED CONFERENCE PUBLICATIONS**

- [C66] M. R. Pazhouhandeh, O. Shoaie, R. Genov, "Two-electrode Impedance-sensing Cardiac Rhythm Monitor for Charge-Aware Shock Delivery in Cardiac Arrest," *subm. IEEE Biomedical Circuits and Systems Conference (BioCAS'2016)*, 2016.
- [C65] H. Kassiri, N. Soltani, M. T. Salam, J. L. P. Velazquez, R. Genov, "Battery-Less Modular Responsive Neurostimulator for Prediction and Abortion of Epileptic Seizures," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2016)*, Montreal, May 2016.
- [C64] P. Z. X. Li, H. Kassiri, R. Genov, "A Compact Low-Power VLSI Architecture for Real-Time Sleep Stage Classification," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2016)*, Montreal, May 2016.
- [C63] M. T. Salam, H. Kassiri, N. Soltani, H. He, J. L. P. Velazquez, R. Genov, "Tradeoffs Between Wireless Communication and Computation in Closed-Loop Implantable Devices," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2016)*, Montreal, May 2016.
- [C62] H. Kassiri, M. T. Salam, F. D. Chen, B. Vatankhah, N. Soltani, M. Chang, P. Carlen, T. A. Valiante, R. Genov, "Inductively Powered Arbitrary-waveform Adaptive-supply Electro-optical Neurostimulator," *IEEE Biomedical Circuits and Systems Conference (BioCAS'2015)*, Atlanta, Oct. 2015.
- [C61] M. T. Salam, J. L. Perez Velazquez, R. Genov, "Comparative Analysis of Seizure Control Efficacy of 5Hz and 20Hz Responsive Deep Brain Stimulation in Rodent Models of Epilepsy," *IEEE Biomedical Circuits and Systems Conference (BioCAS'2015)*, Atlanta, Oct. 2015.
- [C60] N. Soltani, H. Kassiri, H. Jafari, K. Abdelhalim, R. Genov, "130nm CMOS 230Mbps 21pJ/b UWB-IR Transmitter with 21.3% Efficiency," *IEEE European Solid-State Circuits Conference (ESSCIRC'2015)*, Sept. 2015.
- [C59] A. Bagheri, M. T. Salam, J. L. P. Velazquez, R. Genov, "56-Channel Direct-Coupled Chopper-Stabilized EEG Monitoring ASIC with Digitally-Assisted Offset Correction at the Folding Nodes," *IEEE Biomedical Circuits and Systems Conference (BioCAS'2014)*, Lausanne, Oct. 2014.
- [C58] A. Chemparathy, H. Kassiri, M. T. Salam, R. Boyce, F. Bekmambetova, A. Adamantidis, R. Genov, "Wearable Low-Latency Sleep Stage Classifier," *IEEE Biomedical Circuits and Systems Conference (BioCAS'2014)*, Lausanne, Oct. 2014.
- [C57] H. Kassiri, A. Bagheri, N. Soltani, K. Abdelhalim, H. Jafari, M. T. Salam, J. L. P. Velazquez and R. Genov, "Inductively-Powered Direct-Coupled 64-Channel Chopper-Stabilized Epilepsy-Responsive Neurostimulator with Digital Offset Cancellation and Tri-Band Radio," *IEEE European Solid-State Circuits Conference (ESSCIRC'2014)*, Venice, Sept. 2014.
- [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 Resistors for CMOS Neural Amplifiers," *IEEE Biomedical Circuits and Systems Conference (BioCAS'2013)*, Rotterdam, Oct. 2013.
- [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.
- [C46] D. Ho, G. Gulak, R. Genov, "CMOS 3-T Digital Pixel Sensor with In-Pixel Shared Comparator," *IEEE Int. Symp. on Circuits and Systems (ISCAS'2012)*, Seoul, 2012.
- [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.
- [C37] M. Nazari, H. Jafari, L. Leng, A. Guenther, R. Genov, "192-Channel CMOS Neurochemical Microarray," *IEEE Custom Integrated Circuits Conference (CICC'2010)*, Sept. 2010. (**AMD/CICC Student Scholarship Award, one of the highest ranked student papers**)
- [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.
- [C28] J. Aziz, R. Karakiewicz, R. Genov, A. W. L. Chiu, B. L. Bardakjian, M. Derchansky, P. L. Carlen, “In Vitro Epileptic Seizure Prediction Microsystem,” *IEEE Int. Symp. on Circuits and Systems (ISCAS'2007)*, May 2007.
- [C27] J. Aziz, R. Genov, M. Derchansky, B. Bardakjian, P. Carlen, “256-Channel Neural Recording Microsystem with On-Chip 3D Electrodes,” *IEEE International Solid-State Circuits Conference (ISSCC'2007)*, Feb. 2007.
- [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.
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