|  |
| --- |
|  |
| **Roman Genov** |
|  |
| The Edward S. Rogers Sr.Department of Electrical and Computer Engineering10 King's College RoadToronto, Ontario M5S 3G4 Canada | *URL*: http://www.eecg.utoronto.ca/~roman*Email*: roman@eecg.utoronto.ca*Phone*: (416) 946-8666*Fax*: (416) 971-2286 |
| RESEARCH INTERESTS  |
|  | Analog integrated circuits and systems for energy-constrained biological, medical, and consumer sensory applications, such as implantable, wearable and disposable sensory microsystems, sensory-edge machine learning accelerators and wireless sensors; applications include brain-chip interfaces, neuro-stimulators, computational image sensors, and molecular biosensors.  |
| EDUCATION  |
|  | **The Johns Hopkins University**, Ph.D., Electrical and Computer Engineering,Baltimore, MD, 8/2002.Dissertation: Massively Parallel Mixed-Signal VLSI Kernel Machines.Advisor: Gert Cauwenberghs**Massachusetts Institute of Technology**, Visiting Student, Cambridge, MA, 1/1999-8/1999.Artificial Intelligence Lab / Center for Biological and Computational Leaning. **The Johns Hopkins University**, M.S.E., Electrical and Computer Engineering, Baltimore, MD, 1998.**Rochester Institute of Technology**, B.S., Electrical Engineering, Rochester,NY, 1996. |
| ACADEMIC AND INDUSTRIAL POSITIONS  |
|  | **University of Toronto,** Toronto, ON, 7/2014-Present.*Professor*, Department of Electrical and Computer Engineering. Electronics Group and Biomedical Engineering Group.**University of Toronto,** Toronto, ON, 7/2008-6/2014.*Associate Professor*, Department of Electrical and Computer Engineering. Electronics Group and Biomedical Engineering Group.**University of Toronto,** Toronto, ON, 9/2002-6/2008.*Assistant Professor*, Department of Electrical and Computer Engineering. Electronics Group and Biomedical Engineering Group.**The Johns Hopkins University**, Baltimore, MD, 9/96-8/2002.*Research Assistant*, Department of Electrical and Computer Engineering.Adaptive Microsystems Laboratory. **Swiss Federal Institute of Technology (EPFL)**, Lausanne, Switzerland, 6/1998-7/1998.*Visiting Researcher*, Autonomous Systems Lab. **Xerox Corporation**, Webster, NY,3/1996-8/1996. *Design Engineer CO-OP*, Advanced Development Team in the Color Imaging Systems Division. **Atmel Corporation**, Columbia, MD, 6/1995-12/1995. *Design Engineer Intern*, Chesapeake Design Center. |
| AWARDS AND HONORS  |
|  | **International** Best Poster Award, International Conference on Computational Photography, ICCP, (with K. Kutulakos, 95 accepted posters), 2021.Jack Kilby Award for Outstanding Student Paper, IEEE International Solid-State Circuits Conference, ISSCC (with H. Kassiri, the highest ranked student paper), 2018.Best Paper Award, IEEE Transactions on Biomedical Circuits and Systems, TBioCAS (with R. Shulyzki, the top paper, one paper is selected among all published papers over two years, USD $2000 prize), 2017.Best Paper Award, IEEE International Symposium on Circuits and Systems, ISCAS (with H. Kassiri, the top paper, selected by IEEE Biomedical Circuits and Systems Technical Committee, 1687 submitted papers conference-wide), 2016.Best Paper Award, IEEE Biomedical Circuits and Systems Conference, BioCAS (with H. Jafari, the best paper overall, 199 submitted papers), 2011.AMD/CICC Student Award at IEEE Custom Integrated Circuits Conference, CICC (with M. Nazari, $200 prize, one of the highest ranked student papers, 305 submitted papers), 2010.Best Student Paper Award nomination at IEEE Biomedical Circuits and Systems Conference, BioCAS (with K. Abdelhalim, top seven student papers, 126 submitted papers), 2010.Best Student Paper Award, IEEE International Symposium on Circuits and Systems, ISCAS (with A. Nilchi, $400 prize, one of the two best student papers, 1631 submitted papers), 2009.Best Paper Award, IEEE International Symposium on Circuits and Systems, ISCAS (with A. Nilchi, the top paper, selected by IEEE Sensory Systems Technical Committee, 1631 submitted papers conference-wide), 2009.Best Student Paper Contest Finalist, IEEE International Symposium on Circuits and Systems (with F. Shahrokhi, top nine student papers out of 783 regular papers), ISCAS 2009.**National**Award for Excellence in Microsystems CAD Tools and Design Methodology, the winner of CMC TEXPO National Student Research Annual Competition in 2022 (with R. Silva, $3,000 prize).RBC Prize for Innovation & Entrepreneurship, 1st Prize Early-Stage Competition in 2021 (with G. O’Leary, T. Valiante, $10,000 prize).GlobalFoundries Micro-Nanosystems Design Award, the winner of CMC TEXPO National Student Research Annual Competition in 2021 (with R. Gulve, $3,000 prize).Brian L. Barge Award for Excellence in Microsystems Integration, the winner of CMC TEXPO National Student Research Annual Competition in 2008 (with H. Jafari, $3,500 prize), in 2012 (with H. Kassiri and N. Soltani, $3,500 prize), and in 2018 (with R. Pazhouhandeh, $3,500 prize).Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Accelerator Award (awarded to top Canadian research programs superior in originality and innovation; up to 125 awards are offered nation-wide in all NSERC disciplines, $120,000), 2017.1st Rank in Collaborative Health Research Projects competition by Canadian Institutes of Health Research (scored first among 116 submitted proposals), 2016.The MEMSCAP Microsystems Design Award, the winner of CMC TEXPO National Student Research Annual Competition (with A. Bagheri and S. Gabran, $3,000 prize), 2012.DALSA Corporation Award for Excellence in Microsystems Innovation, the winner of a CMC TEXPO National Student Research Annual Competition (with A. Olyaei, $3,000 prize), 2006 and (with K. Abdelhalim, $3,000 prize) 2009.Canadian Institutes of Health Research (CIHR) BioContact Next Generation Award (with M. Derchansky, $2,000 prize), 2005.**Provincial / Local**Connaught Innovation Award (for the development of promising technology) ($75,000; $50,000; $50,000, $75,000), 2016, 2019, 2021 and 2022.Photonics Innovation Centre Award (For a Best Multidisciplinary Project in the Field of Photonics, won by PhD student R. Gulve, $10,000 prize), 2020. Analog Devices Outstanding Student Designer Award (For Excellence in Analog, Mixed-Signal, Digital IC Design, or System-Level IC Architectures, won by PhD student M. ElAnsary, $1,500 prize), 2018.Ontario Neurotech Entrepreneurs Award (for AI-powered software to help physicians more accurately and efficiently identify seizure-producing brain regions, with D. Groppe and T. Valiante, $50,000), 2017.Ontario Brain Institute Entrepreneur Award (for neurotechnology with high commercialization potential, with H. Kassiri, N. Soltani, $50,000), 2015. Heffernan/Co-Steel Innovation Commercialization Fellowship (for research with high commercialization potential, with H. Kassiri, N. Soltani, $34,000), 2015.**Teaching**Departmental Teaching Award, as voted by undergraduate students, Department of Electrical and Computer Engineering, University of Toronto (top four professors in the department, by popular student vote), 2015.Undergraduate Teaching Award for teaching excellence, University of Toronto Students Union (five awards across the university), 2008-2009. |
| RESEARCH GRANTS AND CONTRACTS Annual Total |
|  |
|  | “Personalized Contingent Neurostimulation for Epilepsy by Machine Learning in Organic Brain Interfaces,” PI, Canadian Institutes of Health Research (CIHR) and Natural Sciences and Engineering Council of Canada (NSERC), Collaborative Health Research Projects, 4/2020-3/2023. “Closed-loop Artificially Intelligent Fiber-selective Peripheral Nerve Interface for Neuroprosthetic Applications,” CARTE Seed Project Funding, 4/2020-3/2022.“CenteR for Advancing Neurotechnological Innovation to Application (CRANIA),” co-PI, Canadian Foundation for Innovation ($6.5M), 2018-2023.“Programmable Camera Systems for Transport-Aware Imaging,” co-PI, NSERC Research Tools and Instruments, 4/2018-3/2019.“Heterogeneous Integration of High-Density Analog Crossbar for Advanced Data Processing,” co-PI, Natural Sciences and Engineering Council of Canada (NSERC), Strategic Projects, 10/2017-09/2020. “Artificially Intelligent Neurostimulators for Drug-Resistant Epilepsy,” PI, Canadian Institutes of Health Research (CIHR), Project Grant, 4/2017-3/2022.“Transport-Aware Image Sensors,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Discovery Award, 05/2017-04/2022.“Wireless Neurophotonic Probes for the Interrogation of Neurons in Memory Circuits,” co-PI, Canadian Institutes of Health Research (CIHR) and Natural Sciences and Engineering Council of Canada (NSERC), Collaborative Health Research Projects, 4/2017-3/2020.“A Clinical Study of Seizure-Aborting Implantable Neuro-stimulation Efficacy in Treating Drug-Resistant Epilepsy,” PI, University of Toronto EMHSeed Award, 1/2017-12/2018.“Artificially Intelligent Neurostimulators for Drug-Resistant Epilepsy,” PI, Canadian Institutes of Health Research (CIHR), Project Grant, Bridge Funding, 9/2016-9/2017.“Patient-Specific Adaptive Closed-Loop Neurostimulation for Optimum Treatment of Intractable Epilepsy,” PI, Canadian Institutes of Health Research (CIHR) and Natural Sciences and Engineering Council of Canada (NSERC), Collaborative Health Research Projects, 4/2016-3/2019.“Computational and Optical Processing Architectures for Next-Generation Mobile Cameras,” co-PI, Natural Sciences and Engineering Council of Canada (NSERC), Strategic Projects, 10/2014-09/2017.“Validation of Monitoring Changes in Brain Synchrony to Anticipate Seizures and Implement Feedback Stimulation to Stop Seizure Occurrence,” Co-I, Ontario Brain Institute, 3/2011-4/2013.“Fully Implantable Wireless Multi-Electrode ECoG Monitoring Systems,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Collaborative Health Research Projects, 4/2012-3/2015.“Research Instruments for Experimental Characterization of Wireless Biomedical Sensory Microsystems,” PI, NSERC Research Tools and Instruments, 4/2012-3/2013.“Electronic Microsystems for Ubiquitous Biomedical Sensing,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Discovery Award, 05/2012-04/2017.“A Low-cost, Compact Spectral Imaging Microsystem for Rapid, Regenerative and Highly Selective Nucleic Acid Detection,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Strategic Projects, 10/2010-09/2013.“Micromachined Electrodes and Integrated Circuits for Implantable Cortical Brain Interfaces,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Strategic Projects, 10/2009-09/2012.Short-term contract, PI, Industrial Partner, 2/2008-3/2008.“Electro-Optical Microsystem for DNA Detection,” PI, Ontario Centres of Excellence, Centre for Photonics, 1/2008-9/2008.“2-D Integrated Microsystem for Neural Recording and Stimulation in the Brain,” peer-reviewed Hybrid Integration project, PI, Canadian Microelectronics Corporation, 12/2007-9/2008. “Integrated Neural Interfaces for Epileptic Seizure Monitoring“, Co-I, subcontract from Prof. P. Carlen, University Health Network, University of Toronto, 9/2006-8/2008.“Hybrid Integration Technologies for Optical DNA Detection,” peer-reviewed Hybrid Integration project, PI, Canadian Microelectronics Corporation, 1/2008-12/2008.“Smart Sensory Microsystems,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Discovery Award, 05/2007-04/2012.NSERC Industrial Postgraduate Scholarship (recipient: M.A.Sc. student Farzaneh Shahrokhi), Medtrode Corporation, 9/2006-8/2008.“Hybrid Integration Technologies for Brain-Chip Interfaces,” Hybrid Integration project, PI, Canadian Microelectronics Corporation, 2006.Infrastructure Operating Fund Award, PI, Canada Foundation for Innovation (CFI), 4/2006-3/2010.“Intelligent Sensory Integrated Systems,” PI, New Opportunities Award, Canada Foundation for Innovation (CFI), 11/2005-3/2008.“Intelligent Sensory Integrated Systems,” PI, Ontario Research Fund, 11/2005-3/2008.“Real-time Human Gate Recognition for Automated Surveillance,” Co-I with D. Hatzinakos, K. Plataniotis, and P. Klentrou, Communications and Information Technology Ontario (CITO), 6/2004-5/2006.“Autonomous Integrated Vision Systems,” PI, Natural Sciences and Engineering Council of Canada (NSERC), Discovery Award, 05/2003-04/2007.“Mixed-Signal VLSI Circuits and Systems,” PI, Connaught Foundation, 10/2002.“Mixed-Signal VLSI Circuits and Systems,” PI, University of Toronto, ECE Dept., 10/2002.  | $250,000$60,000$208,000$148,509$127,200$220,000$58,000$62,000$30,000$100,000$77,400$50,500$20,000$60,833$145,545$21,750$75,150$78,240$10,000$30,000­$8,000$13,250$14,000$22,500$6,000$5,000$7,517$33,408$33,408$17,225$20,850$10,000$100,000 | $750,000$120,000$1,041,000$148,509$636,000$1,100,000$290,000$186,000$60,000$100,000$232,200$151,500$40,000$182,500$145,545$108,750$225,450$234,720$10,000$30,000­$8,000$26,500$14,000$112,500$12,000$5,000$30,068$100,226$100,226$34,450$83,400$10,000$100,000 |
| CURRENT GRADUATE / POST-GRADUATE RESEARCH ADVISEES |
|  | **Post-Doctoral Fellows / Scientists** None**PhD Students** Rahul Gulve, 9/2017-current.Nafiseh Ghoroghchian, 9/2017-current (co-supervised with Prof. Draper, 50%).Jose Sales Filho, 5/2018-current.Jianxiong (Jay) Xu, 9/2018-current.Roberto Rangel, 9/2019-current.Mohammad Abdolrazzaghi, 9/2020-current (co-supervised with Prof. Eleftheriades, 50%).Sudip Nag, 1/2021-current.Mustafa Kanchwala, 9/2021-current.Ayandev Barman, 9/2021-current.Yu Huang, 4/2022-current.**MASc Students** Liam Long, 7/2018-current (co-supervised with Profs. T. Valiante and P. Yoo).Don Nguyen, 9/2019-current.Xiaonong (Frank) Sun, 5/2022-current.**MEng Project Students**Sanjana Seerala, 5/2021- current.Sheng Zhao, 1/2022-current.Nicholas Popowich, 1/2022-current.Eiley Tarlton, 5/2022-current. |
| FORMER GRADUATE RESEARCH ADVISEES |
|  | **Former Post-Doctoral Fellows**Tariq Salam (PhD, Ecole Polytechnique, Montreal), Post-Doctoral Fellow, 03/2012-01/2015 (co-supervised with Profs. Perez Velazquez and Carlen, 50%).Project: Seizure Anticipation and Closed-Loop Abortion in Rodent Models of EpilepsyUpon completion: Vice-President of Technology at Avertus, TorontoCurrently: Bioelectronics R&D Engineer at GlaxoSmithKline, Stevenage, UKHyunjoong 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 ImagersUpon completion: Electronics and Telecommunications Research Institute, South KoreaEnver Kilinc (PhD, EPFL, Switzerland), Post-Doctoral Fellow, 03/2015-02/2016 (co-supervised with Prof. Gulak, 50%).Project: Implantable Transceiver and Antenna DesignUpon completion: Post-Doctoral Fellow, University of TorontoCurrently: Co-founder/CTO Co-founder, Micromensio, TorontoNikola Katic (PhD, EPFL, Switzerland), Post-Doctoral Fellow, 04/2016-06/2017 (co-supervised with Prof. Kutulakos, 50%).Project: Transport-aware Image SensorsUpon completion: Senior Analog Design Engineer at Synopsys, TorontoCurrently: Senior Analog Design Engineer, Intel, TorontoXuan-Thuan Nguyen (PhD, University of Electro-Communications, Japan), Post-Doctoral Fellow, 3/2018-2/2019.Project: Digital Accelerators of Machine Learning Algorithms for Closed-loop NeurostimulationUpon completion: Digital Designer at Tradetone Research Labs , TorontoDavid Groppe (PhD, UCSD, USA) Post-Doctoral Fellow / Research Scientist, 09/2016-09/2019 (co-supervised with Prof. T. Valiante, 50%).Project: Machine Learning Algorithms for Closed-loop NeurostimulationUpon completion: Clinical Data Scientist at Persyst Development Corporation, TorontoZhengfan Xia (PhD, Tohoku University, Japan), Post-Doctoral Fellow, 10/2017-10/2019 (co-supervised with Prof. R. Kutulakos, 50%).Project: Digital Systems for Computational Photography CamerasUpon completion: Digital Designer at Tradetone Research Labs , TorontoAmirali Amirsoleimani (PhD, University of Windsor, Canada), Post-Doctoral Fellow, 2/2018-06/2021.Project: Monolithic CMOS-Memristor Integrated SystemsUpon completion: Assistant Professor at York University, Toronto**Former PhD Students**Karim Abdelhalim, Ph.D. Degree, 09/2007-01/2013.Thesis: Wireless Neural Recording and Stimulation SoCs for Monitoring and Treatment ofIntractable EpilepsyUpon graduation: IC Design Engineer at Broadcom Inc, Irvine, CACurrently: Senior Staff Engineer at Inphi, Orange County, CADerek Ho, Ph.D. Degree, 09/2007-01/2013 (co-supervised with Prof. G. Gulak).Thesis: CMOS Imager Design Optimizations for DNA Fluorescence BiosensingUpon graduation: Associate Professor, Department of Physics, City University of Hong KongHamed Jafari, Ph.D. Degree, 09/2007-05/2013.Thesis: CMOS Universal Real-time Label-free DNA Analysis System-on-chip Upon graduation: IC Design Engineer at Semtech/Snowbush, Toronto, OntarioCurrently: CTO and Co-Founder at EnviroSen, TorontoHossein Kassiri, Ph.D. Degree, 02/2011-12/2015.Thesis: Multi-Modal Densely-Integrated Closed-Loop Neurostimulators for Monitoring andTreatment of Neurological DisordersUpon graduation: Assistant Professor, Department of Electrical Engineering and Computer Science, York University, TorontoNima Soltani, Ph.D. Degree, 09/2011-12/2015.Thesis: Inductively-Powered Implantable Integrated Circuits for Amperometric Brain ChemistryUpon graduation: Analog and Mixed-Signal Design Engineer at Synopsis, TorontoCurrently: Analog and Mixed-Signal Design Engineer at Intel, TorontoMaged ElAnsary, Ph.D. Degree, 9/2015-12/2019.Thesis: Multi-modal Fully-wireless SoCs for Interfacing with the Nervous SystemUpon graduation: Analog and Mixed-Signal Design Engineer at Rambus, TorontoReza Pazhouhandeh, 9/2015-11/2019.Thesis: BRAINI: Bidirectional Rail-to-Rail Artifact-Immune Neural-InterfaceUpon graduation: Analog and Mixed-Signal Design Engineer at AnalogX, TorontoNavid Sarhangnejad, 9/2014-3/2021.Thesis: Per-Pixel Coded-Exposure CMOS Image SensorsUpon graduation: Analog IC Design Engineer at Huawei, TorontoGerard O’Leary, 9/2017-2/2022.Thesis: Closed-Loop Neuroelectronic Interfaces: In Vitro to Silicon to Clinical TranslationUpon graduation: NerveX, CEO, Toronto**Former MASc Students**Ashkan Olyaei, M.A.Sc. Degree, 09/2003-04/2006.Thesis: ViPro: Focal-Plane CMOS Spatially-Oversampling Computational Image SensorUpon graduation: Staff Manager / Senior Staff RF-Analog Design Engineer at Marvell Semiconductor, San Jose, CARafal Karakiewicz, M.A.Sc. Degree, 09/2003-08/2006. Thesis: Mixed-Signal VLSI Adiabatic Array ComputingUpon graduation: Analog IC Design Engineer at Synopsis, Snowbush, TorontoCurrently: Analog IC Design Manager at Intel, Toronto, ONJoseph Aziz, M.A.Sc. Degree, 09/2004-10/2006 (co-supervised with Prof. B. Bardakjian).Thesis: Multi-Channel Signal-Processing Integrated Neural InterfacesUpon graduation: Analog IC Design Engineer at Broadcom, Textronix, InphiCurrently: Touch ASIC Architect at Apple, Cupertino, CAAlireza Nilchi, M.A.Sc. Degree, 09/2005-11/2007.Thesis: Focal-Plane CMOS Algorithmically-Multiplying Computational Image SensorUpon graduation: Analog IC Design Engineer at Intel, TorontoCurrently: Senior Staff Scientist at Broadcom, Irvine, CAMeisam Nazari, M.A.Sc. Degree, 01/2006-06/2008. Thesis: CMOS Wide-Dynamic-Range High-Throughput PotentiostatUpon graduation: PhD student at California Institute of TechnologyCurrently: Postdoctoral Fellow at California Institute of Technology Ritu Raj Singh, M.A.Sc. Degree, 09/2006-11/2008.Thesis: Luminescence Contact Imaging MicrosystemsUpon graduation: PhD student at University of Texas, AustinCurrently: Senior IC Design Engineer at InSilixa, Sunnyvale, CAFarzaneh Shahrokhi, M.A.Sc. Degree, 09/2006-01/2009.Thesis: Multi-Channel Fully Differential Digital Integrated Neural Recording and Stimulation InterfacesUpon graduation: IC Design Engineer at Synaptics Inc, Santa Clara, CARuslana Shulyzki, M.A.Sc. Degree, 09/2006-09/2009.Thesis: Bidirectional Integrated Neural Interface for Adaptive Cortical StimulationUpon graduation: IC Design Engineer at Ignis Innovation Inc, Waterloo, OntarioCurrently: Analog IC Design Engineer at Intel, TorontoArezu Bagheri, M.A.Sc. Degree, 09/2010-09/2013.Thesis: High-Integration-Density Neural Interfaces for High-Spatial-Resolution IntracranialEEG MonitoringUpon graduation: IC Design Engineer at Semtech/Snowbush, Toronto, OntarioCurrently: Senior Analog Mixed-Signal Design Engineer at Peregrine Semiconductor, San DiegoArshya Feyzi, M.A.Sc. Degree, 09/2011-10/2014. (co-supervised with Prof. G. Gulak).Thesis: A CMOS Multi-Modal Contact-Imaging Scanning MicroscopeUpon graduation: IC Design Engineer at Analog Devices, Boston, MAWilfred Cho, M.A.Sc. Degree, 09/2015-10/2017.Thesis: Proxy Relearning for Feature-Driven Pattern Recognition in High-Dimensional Imbalanced Time Series Data SetsUpon graduation: Machine Learning Engineer at Evolv TechnologiesGerard O’Leary, M.A.Sc. Degree, 09/2015-01/2018.Thesis: Intelligent Medical Devices for Brain State Classification and Responsive NeuromodulationUpon graduation: PhD student at the University of TorontoGairik Dutta, M.A.Sc. Degree, 7/2016-1/2019.Thesis: Column-Parallel 7μm-pitch 2nd-order ∆Σ ADCs for Computational Image SensorsUpon graduation: IC Design Engineer at Rambus, TorontoNikita Gusev, M.A.Sc. Degree, 9/2017-9/2019.Thesis: System-Level Design of Coded-Exposure Cameras for Computational Imaging ApplicationsUpon graduation: Design Engineer at Alphawave, TorontoCamilo Tejeiro, M.A.Sc. Degree, 1/2018-4/2020.Thesis: Low-power Edge-combining Ring-oscillator-based RF Transmitters for Flexible-electrode Neural MicroimplantsUpon graduation: IC Design Engineer at Synopsys, TorontoSaima Ali, 9/2017-9/2020 (co-supervised with Prof. M. Popovic).Thesis: Design of a Wireless Communication System for Neural ImplantsUpon graduation: PhD student, University of TorontoJamie Koerner, M.A.Sc. Degree, 9/2018-10/2020 (co-supervised with Prof. T. Valiante).Thesis: Machine Learning-Driven Patient-Specific Early Seizure Detection for Neuromodulation Devices Upon graduation: PhD student, Massachusetts Institute of TechnologyMotasem Sakr, M.A.Sc. Degree, 9/2019-9/2021.Thesis: Hardware-Efficient Accelerators for Mask Generation in Coded-Exposure CamerasUpon graduation: IC Design Engineer at NVIDIA, Toronto**Former MEng Students**Yu Hu, M.Eng. Degree, 5/2014-8/2014. Project: High-Voltage Neural Stimulator with Adaptive Loading ConsiderationAtul Patridar, M.Eng. Degree, 5/2014 -8/2014. Project: Wireless Radio Connectivity for Responsive Neuro-Stimulation ImplantsJiaming Liu, M.Eng. Degree, 5/2014-8/2014. Project: Wirelessly Powering for Responsive Neuro-Stimulation ImplantsAditi Chemparathy, M.Eng. Degree, 10/2013-12/2014. Project: Low-Latency Sleep Stage ClassifierKevin Lee, M.Eng. Degree, 05/2015-09/2015.Project: High-Speed I/O Design for Pixel Programmable CMOS Image Sensor Hardik Patel, M.Eng. Degree, 05/2015-12/2015. Project: Optoelectronic Testing Platform for 3D Image Sensors CharacterizationAsish Abraham, M.Eng. Degree, 04/2016-05/2017.Project: ASIC Implementation of a Low-Power Microcontroller for Implantable Biomedical System ControlGoutham Palaniappan, M.Eng. Degree, 04/2016-08/2017.Project: Wireless Powering Systems for Neural ImplantsVeronica Li, M.Eng. Degree, 12/2016-08/2017. Project: Low-noise Microelectronic Interface for Brain-Monitoring Microelectrode ArraysNaba Siddiqui, M.Eng. Degree, 01/2017-08/2017. Project: 3D Graphical User Interface for Localizing Intracranial Electrode LocationsXu (Jay) Jianxiong, Candidate for M.Eng. Degree, 4/2017-8/2018.Project: Wireless Power Transfer to Integrated CircuitsJaimin Joshi, Candidate for M.Eng. Degree, 4/2017-7/2018.Project: Digital Systems for Real-Time Impedance SpectroscopySrinidhi Balasubrahmanya, Candidate for M.Eng. Degree, 6/2017-7/2018.Project: High-speed Wireline Communications William Isaac, Candidate for M.Eng. Degree, 8/2018-5/2019.Project: Bio-electronic Systems for Neural Recording     Atul Grover, Candidate for M.Eng. Degree, 4/2019-9/2019.Project: Implementation of Support Vector Machine on Memristive HardwareSzu-Chieh Fang, Candidate for M.Eng. Degree, 4/2019-1/2020.Project: Design of a Software Interface for a Memristive Machine Learning PlatformChenxi Tang, Candidate for M.Eng. Degree, 2/2019-4/2020.Project: Digitally Assisted Analog Front EndsJaina Patel, Candidate for M.Eng. Degree, 4/2019-5/2020. Project: FPGA-based ASIC Test FrameworkKartik Sunil Sharma, Candidate for M.Eng. Degree, 6/2019-5/2020.Project: Design and verification of on-chip Impedance Measurement SystemsRakshith Ramesh, Candidate for M.Eng. Degree, 5/2020-8/2020.Project: Electronic Interfacing with In-vitro Microelectrode ArraysYaoming Yin, Candidate for M.Eng. Degree, 1/2020-12/2020.Project: Layout Design and Characterization of ADC Circuits for Coded-Exposure Image SensorsYushi Gavin Guan, Candidate for M.Eng. Degree, 5/2020-4/2021.Project: Seizure Generation by Generative Adversarial NetworksGuanyan Han, Candidate for M.Eng. Degree, 5/2021- 8/2021.Project: Successive Approximation ADC for an Image Sensor |
| UNDERGRADUATE DESIGN PROJECT AND THESIS ADVISEES |
|  | 2003-20042004-20052005-20062006-20072007-20082008-20092009-20102011-20122012-20132013-20142014-20152015-20162017-20182018-20192019-20202021-2022 | King Sun (Francis) Tam T.K. Chan Po-Yu Liu Mustafa Alam Ahmad Attia Ajmal Khan Taha Sheikh Houman Akbari Negar Habibi Yasaman Faghih John Tan Colin Li Chuan Qin Ruslana GelmanAngie Mehta Khaled QasmiehKhalil Oudah Tina Tahmoures-ZadehJon PerrasNatasha BakerBrian ChoiDavid WuKim LiuEric PaiRyan PayogoFady AkladiosBenny TuDavid CrockettVadim SmolyakovChi Kin ChongMuhammad FarhandarRobert Gunabalendra Horia PopoviciVisnuthanan SiritharanJohn SisonDarshan ThothiralingWen Jie YanXin Yun ZhangZhao Yuan ZhengMiaad Seyed AlirotehAdam ShierNikita TarakanovSiddharth KaulChan Hu NgenJunaid IkramSheraz QadeerRichard GaoDerek PetersonKyeong (Kris) KangGuang-Yo (Zack) TzengChang LiuDavid GalusTerrence Cole Millar Dan LitovitzChi-Chun TienPeter Zhi Xuan LiNhien Tran-NguyenFrancis KangDerek LamYae Seoung (Yuni) KimAshley Hung Timothy Yeung Jaden Reimer  | (design project)(design project)(design project)(design project)(design project)(design project)(design project)(design project)(design project)(design project)(design project, co-supervised with Prof. B. Bardakjian)(design project, co-supervised with Prof. B. Bardakjian)(design project, co-supervised with Prof. B. Bardakjian)(design project)(design project)(design project)(design project)(design project)(undergraduate thesis)(design project)(design project)(design project) (design project)(design project)(design project)(design project)(design project)(design project)(undergraduate thesis)(design project)(design project)(design project)(design project)(design project)(design project)(design project)(design project)(design project)(design project)(undergraduate thesis)(design project)(design project)(design project)(design project)(design project)(design project)(undergraduate thesis)(undergraduate thesis)(undergraduate thesis)(undergraduate thesis)(undergraduate thesis)(undergraduate thesis)(undergraduate thesis)(design project)(design project)(undergraduate thesis)(undergraduate thesis)(undergraduate thesis)(undergraduate thesis)(undergraduate thesis)(design project)(design project)(design project) |
| UNDERGRADUATE RESEARCH ADVISEES |
|  | 20042005200620112013201420152016201720182019202020212022 | Alborz JooyaieJohn TanHsiang-Hua (Andy) HungRuslana GelmanJasper ChanGaurav Jain Stephen ChinKhalil OudahAmogh VidwansKevin GumbaAlison MaRenan Goulart HeinzenCaroline Marinho ManoPedro Veit MichelWillian BeneducciMarcelo Bissi PiresFadime BekmambetovaFu-Der (Fred) ChenBehraz VatankhahghadimPeter Zhi Xuan LiSeyedeh Sana TonekaboniChristopher LucasiusSepehr SemsarAlan LiGairik DuttaShreedutt HegdeJesse BarcelosChengzhi (Winston) LiuTerrence Cole Millar Mary Catherine McIntosh Anastasia KolesnikovPeter TanugrahaEthan WenDayeol Choi Peter Zhi Xuan Li Akshay Kamath Sepehr SemsarKamyar GhofraniR. Andrei Romero AlvarezJi Tong (Michael) YinTerrence Cole Millar Nikita Gusev Winston LiuVincent LoNafis AhbabAnas AhmedSanjana Seerala Ali HaydarogluYin Tai HuangHui Feng Ke Shichen LuGilead PoslunsShahryar RajabzadehHui Di WangJinzhuo (Sarah) TangZiming (Michael) Xiong Qingchong Zeng Ken Chen *Led by G. O’Leary:*Farhad YusufaliFrancis Kang Adam GierlachJamie KoernerSonali Dey*Led by R. Pazhouhandeh:*Michael KarrasZhiwei LiuNhien Tran-NguyenSaad Jameel*Led by M. ElAnsary*Zihan (Simon) ZhaoMichelle TessyM.Mustafa Arif*Led by R. Gulve*Tobias RozarioYangfan WangAlexander BuckYuanli (Danny) DingXinyi (Cindy) HouQingchong ZengTianyi (Ronan) Zhang*Led by G. O’Leary:*Nizar IslahAditya SaigalAdam GierlachShounak SuralBipasha Goyal*Led by A. Amirsoleimani:*Nhien Tran NguyenMartin FfrenchTony Liu*Led by R. Gulve:*Sharon LinEn Xu LiDylan Hai-Hien DaoXin ChenYifan CuiRain Wu*Led by J. Sales:*Sidharth Thomas*Led by A. Amirsoleimani:*Louis PrimaueTony LiuBenjamin ChangTengyu SongChenqi LiShawn ZhangShakiba TonekabonipourMichael XiongSzu-Chieh FangDaniel Pinheiro LealVince TranVince Tran*Led by G. O’Leary:*Jake SprengerAhmed AbdelmoneimRakshith RameshMaitreyi JoshiNizar IslahYushi Gavin GuanZhiyu Yang*Led by R. Gulve:*Alex BuckSean WuKathy ZhuangAbdullah MohammedMargarita DiazAbhay GopinathanDrini KercikuZongyan (Paul) YaoSelina Wan*Led by J. Sales:*Samantha UngerKarissa ChanColin Graham*Led by J. Sales:*Albert HuangHaoxiang YangArielle ZhangPatty LiuGuozhen Ding*Led by G. O’Leary:*Cameron RodriquezRobert PurcaruSoliman AliKevin ZhuFabin FlasiusChirag Sethi*Led by R. Rangel:*Qianqian ZhangLeo HanxuArash DehkordiIliya ShofmanNicholas PopowichXiaonong Frank Sun*Led by A. Amirsoleimani:*Tony FuJack CaiBrian ChenVince TranAli AlsharaawiRishabh SainiXuening DingJonathan Wu Tianyi Tim ZhangRico ZhuKevin WangLouis Primaue Benjamin Cheng Chenqi Li*Led by N. Ghoroghchian:*Hanna SingurdsonLokeesan KaneshwaranNick Nabavi*Led by J. Sales:*Shafinul HaqueKemeng HanYuan (Jenny) SuiOurong Lin*Led by A. Amirsoleimani:*Xun CaiYan ZhuTimothy ZhangArielle ZhangLouis PrimeauChenxin ZhengJonathan WooXuening DongAli Al-sharaawiBrian ChenHao YouMuhammad Ahsan Kaleem*Led by S. Nag:*Mengyan ZhuKevin Kim*Led by R. Rangel:*David ShemeshBora BayazitDeeksha TewariKarthikeyan R*Led by M. Abdolrazzaghi:*Aditya Sharma*Led by F. Torres:*Aditya Mohan | (NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(summer student)(MITACS summer student from India)(NSERC USRA summer student)(NSERC USRA summer student)(summer student from Brazil)(summer student from Brazil)(summer student from Brazil)(summer student from Brazil)(summer student from Brazil)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(MITACS summer student from India)(MITACS summer student from India)(summer research student)(summer research student)(summer research student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(summer intern from Department of Math)(summer intern from Department of Math)(volunteer research student)(MITACS summer student from India)(summer research student)(summer research student from U. of Waterloo)(summer research student from Department of CS)(summer research student, from Department of EngSci)(summer intern)(NSERC USRA summer student)(research student)(summer research student)(summer research student)(summer research student)(summer research student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(UTEA-NSE summer student)(summer research student)(summer research student)(summer research student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(First Year Student Research Fellowship)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(summer research student)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(ECE Admission Research Scholar)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(summer research student)(summer research student)(summer research volunteer)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(MITACS summer student from India)(ESROP summer student)(NSERC USRA summer student)(NSERC USRA summer student)(summer research volunteer)(NSERC USRA summer student)(NSERC USRA summer student)(NSERC USRA summer student)(UTEA-NSE summer student)(UTEA-NSE summer student)(summer research student)(MITACS summer student from India)(NSERC USRA research student)(summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(NSERC USRA research student, Fall term)(FYSRP summer student)(summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(MITACS summer student from China)(summer research student)(ESROP summer student)(ESROP summer student)(summer research student)(summer research student)(summer research student)(summer research student)(ESROP summer student)(summer research student)(NSERC USRA research student)(NSERC USRA research student)(summer research student)(NSERC USRA research student)(NSERC USRA research student)(summer research student)(NSERC USRA research student)(summer research student)(summer research student)(summer research student)(NSERC USRA research student)(NSERC USRA research student)(summer research student)(summer research student)(summer research student)(NSERC USRA research student)(summer research student)(summer research student)(summer research student)(NSERC USRA research student)(summer research student)(ESROP research student) (ESROP research student) (summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(NSERC USRA research student)(summer research student)(summer research student)(Part-time summer research student) (Part-time summer research student) (Part-time summer research student) (NSERC USRA research student)(NSERC USRA research student)(summer research student)(NSERC USRA research student)(UTEA-NSE summer student)(summer research student)(summer research student)(NSERC USRA research student)(summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(summer research student)(NSERC USRA research student)(summer research student)(summer research student)(NSERC USRA research student)(UTEA-NSE summer student)(MITACS summer student from India)(MITACS summer student from India)(MITACS summer student from India) |

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

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

|  |
| --- |
| BOOK CHAPTERS  |
|  | [BC5] H. Kassiri, R. Genov, “Implantable Brain-Computer Interfaces for Monitoring and Treatment of Neurological Disorders,” Handbook of Biochips, Springer, 2022.[BC4] A. Amirsoleimani, T. Liu, F. Alibart, S. Ecoffey, Y. F. Chang, D. Drouin and R. Genov, “Mitigating State-Drift in Memristor Crossbar Arrays for Vector Matrix Multiplication,” in “Memristor-An Emerging Device for Post-Moore’s Computing and Applications,” IntechOpen, 2021.[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 |
|  | [J67] Y. E. Hwang, L. Long, J. Sales Filho, R. Genov, J. Zariffa, “Closed-loop control of functional electrical stimulation using a bidirectional and selective nerve cuff interface,” subm. *Journal of Neural Engineering*, 2023.[J66] R. Gulve, N. Sarhangnejad, G. Dutta, M. Sakr, D. Nguyen, R. Rangel, W. Chen, Z. Xia, M. Wei, N. Gusev, E. Lin, X. Sun, L. Hanxu, N. Katic, A. Abdelhadi, A. Moshovos, K. N. Kutulakos, R. Genov, “39,000 Subexposures/s Dual-ADC CMOS Image Sensor with Dual-tap Coded-exposure Pixels for Single-Shot HDR and 3D Computational Imaging,” subm. *IEEE Journal of Solid-State Circuits*, 2023.[J65] G. O'Leary, J. Koerner, J. Sales Filho, J. Xu, T. Valiante, R. Genov, “BrainForest: Neuromorphic Multiplier-Less Bit-Serial Weight Memory-Optimized 1024-Tree Brain-State Classification Processor,” subm. *IEEE Journal of Solid-State Circuits*, 2023.[J64] T. Zhang, C. Lammie, M. R. Azghadi, A. Amirsoleimani, R. Genov, “A Survey of Spike Sorting Hardware Implementations: From Template Matching to Computing in Memory,” subm. *Journal of Neural Engineering*, 2023.[J63] R. Gulve, N. Sarhangnejad, H. Ke, Z. Xia, N. Gusev, N. Katic, K. N. Kutulakos, R. Genov, “Scene-aware Pixelwise-Adaptive Coded-Exposure HDR Imaging with Reduced Motion Artifact,” subm. *IEEE Transactions on Circuits and Systems-I*,2023.[J62] Y. E. Hwang, R. Genov, J. Zariffa, “Resource-efficient Neural Network Architectures for Classifying Nerve Cuff Recordings on Implantable Devices,” under rev. *IEEE Transactions on Biomedical Engineering*, 2023.[J61] H. Jafari, X. Liu, R. Genov, “Synergistic Distributed Thermal Regulation for On-CMOS High-Throughput Multi-Modal Amperometric DNA-Array Analysis,” *IEEE Open Journal of Solid-State Circuits*, 2023.[J60] N. Soltani, H. Jafari, K. Abdelhalim, H. Kassiri, X. Liu, R. Genov, “A 21.3%-Efficiency Clipped-Sinusoid UWB Impulse Radio with Simultaneous Inductive Powering and Data Transmission,” *IEEE Transactions on Biomedical Circuits and Systems*,2023.[J59] C Li, C Lammie, A Amirsoleimani, MR Azghadi, R Genov, “Simulation of memristive crossbar arrays for seizure detection and prediction using parallel Convolutional Neural Networks,” Software Impacts, 2023.[J58] X. Dong, A. Amirsoleimani, M. R. Azghadi, R. Genov, "WALLAX: A Memristor-based Random Number Generator," *Neurocomputing*, 2022.[J57] M. R. Pazhouhandeh, A. Amirsoleimani, I. Weisspapir, P. Carlen, R. Genov, “Adaptively Clock-boosted Auto-ranging Neural-interface for Emerging Neuromodulation Applications,” *IEEE Transactions on Biomedical Circuits and Systems*, 2022.[J56] C. Li, C. Lammie, X. Dong, A. Amirsoleimani, M. Rahimi Azghadi, and R. Genov, “Seizure Detection and Prediction by Parallel Memristive Convolutional Neural Networks,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 16, No. 4, pp. 609-625, Aug. 2022.[J55] T. Liu, A. Amirsoleimani, J. Xu, F. Alibart, Y. Beilliard, S. Ecoffey, D. Drouin, and R. Genov, “CODEX: Stochastic Encoding Method to Relax Resistive Crossbar Accelerator Design Requirements,” *IEEE Transactions on Circuits and Systems-II: Express Briefs*, Vol. 69, No. 6, 3356-3360, Aug. 2022.[J54] N. Soltani, M. ElAnsary, J. Sales, J. Xu, R. Genov, “Safety-optimized Inductive Powering of Implantable Medical Devices: A Tutorial and Comprehensive Design Guide,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 15, No. 6, pp. 1354-1367, Dec. 2021.[J53] M. ElAnsary, J. Xu, J. S. Filho, G. Dutta, L. Long, A. Shoukry, C. Tejeiro, C. Tang, E. Kilinc, J. Joshi, P. Sabetian, S. Unger, J. Zariffa, P. Yoo, R. Genov, “Bidirectional Peripheral Nerve Interface with 64 2nd-order Opamp-less ∆Σ ADCs and Fully-integrated Wireless Power/Data Transmission,” *IEEE Journal of Solid-State Circuits*, Vol. 56, No. 11, pp. 3247-3262, Nov. 2021.[J52] M. R. Pazhouhandeh, H. Kassiri, I. Weisspapir, A. Shoukry, P. Carlen, R. Genov, “Opamp-less Sub-µW/Channel Δ-modulated Neural-ADC with Super-GΩ Input Impedance,” *IEEE Journal of Solid-State Circuits*, Vol. 56, No. 5, pp. 1565-1575, May 2021.[J51] T. Liu, A. Amirsoleimani, F. Alibart, S. Ecoffey, D. Drouin, R. Genov, “AIDX: Adaptive Inference Scheme to Mitigate State-Drift in Memristive VMM Accelerators,” *IEEE Transactions on Circuits and Systems-II: Express Briefs*, Vol. 68, No. 4, pp. 1128-1132, Apr. 2021.[J50] A. Amirsoleimani, F. Alibart, V. Yon, J. Xu, M. Pazhouhandeh, S. Ecoffey, Y. Beilliard, R. Genov, D. Drouin, “In-Memory Vector-Matrix Multiplication in Monolithic CMOS-Memristor Integrated Circuits: Design Choices, Challenges and Perspectives,” *Advanced Intelligent Systems*, Wiley, Vol. 2, No. 11, pp. 1-23, Nov. 2020.[J49] M. R. Pazhouhandeh, M. Chang, I. Weisspapir, T. Valiante, P. Carlen, R. Genov, “Track-and-Zoom Neural Analog-to-Digital Converter with Blind Stimulation-Artifact Rejection,” *IEEE Journal of Solid-State Circuits*, Vol. 55, No. 7, pp. 1984-1997, July 2020.[J48] M. ElAnsary, N. Soltani, H. Kassiri, R. Machadoa, S. Dufour, P. Carlen, M. Thompson, R. Genov, “50nW Opamp-less ∆Σ-modulated Bioimpedance Spectrum Analyzer for Electrochemical Brain Interfacing,” *IEEE Journal of Solid-State Circuits,* Vol. 55, No. 7, pp. 1971-1983, July 2020.[J47] N. Guo, S. Wang, R. Genov, L. Wang, D. Ho, “Asynchronous Event-driven Encoder with Simultaneous Temporal Envelope and Phase Extraction for Cochlear Implants,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 14, No. 3, pp. 620-630, June 2020*.*[J46] N. Ghoroghchian, D. M. Groppe, R. Genov, T. A. Valiante, and S. C. Draper, “Node-Centric Graph Learning from Data for Brain State Identification,” *IEEE Transactions on Signal and Information Processing over Networks*, Vol. 6, pp. 120-132, Jan. 2020.[J45] N. Sarhangnejad, N. Katic, Z. Xia, M. Wei, N. Gusev, G. Dutta, R. Gulve, P. Li, H. Ke, H. Haim, M. Monero-Garcia, D. Stoppa, K. Kutulakos, R. Genov, “Dual-tap Computational Photography Image Sensor with Per-pixel Pipelined Digital Memory for Intra-frame Coded Multi-exposure,” *IEEE Journal of Solid-State Circuits,* Vol. 54, No. 11,pp. 3191-3202, Nov. 2019.[J44] 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,” *IEEE Transactions on Neural Systems & Rehabilitation Engineering,* Vol. 27, No. 4, pp. 582-593, Apr. 2019.[J43] G. O’Leary, D. Groppe, T. Valiante, N. Verma, R. Genov, “NURIP: Neural Interface Processor for Brain State Classification and Programmable-Waveform Neurostimulation,” *IEEE Journal of Solid-State Circuits,* Vol. 53, No. 11, pp. 3150-3162, Nov. 2018*.* **(Invited, special issue on best papers of IEEE ISSCC’18 Conference)**[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,* Vol. 12, No. 5, pp. 1165-1176, Oct*.* 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, March2009.[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 |
|  | [C104] M. Abdolrazzaghi, R. Genov, G. Eleftheriades, “2D Scanning by Subwavelength Superoscillatory Focused Beams for Wireless Power Delivery,” subm. *IEEE International Symposium on Antennas and Propagation*, July 2023.[C103] Z. Yang, J. Koerner, G. O’Leary, T. A. Valiante, R. Genov, “Hardware-Efficient 1D CNN for Patient-Specific Early Seizure Detection,” subm., *IEEE Engineering in Medicine and Biology Conference (EMBC),* July 2023.[C102] R. Rangel, N. Sarhangnejad, M. Wei, R. Gulve, A. Barman, G. Dutta, Z. Xia, N. Gusev, N. Katic, H. Haim, K. N. Kutulakos, and R. Genov, “Flexible Spectrally-Scanning Snapshot Multispectral Imaging on Dual-Tap Coded-Exposure-Pixel CMOS Image Sensors,” *International Image Sensor Workshop (IISW),* May 2023*.*[C101] J. Xu, J. S. Filho, S. Nag, L. Long, C. Tejeiro, E. Hwang, G. O'Leary, Y. Huang, M. Kanchwala, M. Abdolrazaghi, C. Tang, P. Liu, Y. Sui, X. Liu, J. Zariffa, R. Genov, “Fascicle-Selective Bidirectional Peripheral Nerve Interface IC with 173dB FOM Noise-Shaping SAR ADCs and 1.38 pJ/bit Frequency-Multiplying Current-Ripple Radio Transmitter,” *IEEE* *International Solid-State Circuits Conference* (*ISSCC*), San Francisco, Feb. 2023.[C100] R. Gulve, R. Rangel, A. Berman, D. Nguyen, M. Wei, M. Sakr, X. Sun, D. B. Lindell, K. N. Kutulakos, R. Genov, “Dual-Port CMOS Image Sensor with Regression-Based HDR Flux-to-Digital Conversion and 80ns Rapid-Update Pixel-Wise Exposure Coding,” *IEEE* *International Solid-State Circuits Conference* (*ISSCC*), San Francisco, Feb. 2023.[C99] T. Zhang, C. Lammie, A. Amirsoleimani, M. Rahimi Azghadi, R. Genov, “Toward A Streamlined Approach for Spike Sorting Algorithms and Hardware Evaluation,” *IEEE Midwest Symposium on Circuits and Systems (MWSCAS)*, Fukuoka, Japan, Aug. 2022.[C98] M. Abdolrazzaghi, R. Genov, G. Eleftheriades, “Antenna Array for Wireless Power Transfer to Deep-Brain Implants,” *IEEE International Symposium on Antennas and Propagation*, July 2022.[C97] X. Dong, A. Amirsoleimani, M. Rahimi Azghadi, R. Genov, “GRINX: In-Memory Memristive Transformation Stage of Gaussian Random Number Generator,” *IEEE International Conference on Omni-Layer Intelligent Systems (COINS),* Barcelona, Spain, Aug. 2022.[C96] R. Gulve, N. Sarhangnejad, G. Dutta, M. Sakr, D. Nguyen, R. Rangel, W. Chen, Z. Xia, M. Wei, N. Gusev, E. Y. H. Lin, W. Sun, L. Hanxu, N. Katic, A. Abdelhadi, A. Moshovos, K. N. Kutulakos, R. Genov, “A 39,000 Subexposures/s CMOS Image Sensor with Dual-tap Coded-exposure Data-memory Pixel for Adaptive Single-shot Computational Imaging,” *Symposium on VLSI Circuits*, Honolulu, June 2022.[C95] C. Lammie, J. Eshraghian, C. Li, A. Amirsoleimani, R. Genov, W. Lu, M. Rahimi Azghadi, “Design Space Exploration of Dense and Sparse Mapping Schemes for RRAM Architectures,” *IEEE Int. Symp. on Circuits and Systems (ISCAS)*, Austin, Texas, May 2022.[C94] L. Primeau, A. Amirsoleimani, R. Genov, “SDEX: Monte Carlo Simulation of Stochastic Differential Equations on Memristor Crossbars,“ *IEEE Int. Symp. on Circuits and Systems (ISCAS'2022)*, Austin, Texas, May 2022. [C93] A. Alsharaawi, A. Amirsoleimani, R. Genov, “PRUNIX: Non-Ideality Aware Convolutional Neural Network Pruning for Memristive Accelerators, “ *IEEE Int. Symp. on Circuits and Systems (ISCAS)*, Austin, Texas, May 2022.[C92] J. Cai, A. Amirsoleimani, R. Genov, “HYPERLOCK: In-Memory Hyperdimensional Encryption in Memristor Crossbar Array,”  *IEEE Int. Symp. on Circuits and Systems (ISCAS)*, Austin, Texas, May 2022. [C91] M. Abdolrazzaghi, R. Genov, G. Eleftheriades, “Microwave Planar Sensor Antenna for Glucose Sensing in Aqueous Solutions,” *IEEE International Symposium on Antennas and Propagation*, Dec. 2021.[C90] Y. Guan, J. Koerner, T. A. Valiante, R. Genov, G. O’Leary, “Generative Adversarial Network-Based Synthetic Seizure Dataset Augmentation,” *IEEE EMBS Conference on Neural Engineering (NER’19),* May, 2021.[C89] M. ElAnsary, J. Xu, J. S. Filho, G. Dutta, L. Long, A. Shoukry, C. Tejeiro, C. Tang, E. Kilinc, J. Joshi, P. Sabetian, S. Unger, J. Zariffa, P. Yoo, R. Genov, “Multi-modal Peripheral Nerve Active Probe and Microstimulator with On-chip Dual-coil Power/Data Transmission and 64 2nd-order Opamp-less ΔΣ ADCs,” *IEEE* *International Solid-State Circuits Conference* (*ISSCC*), San Francisco, Feb. 2021.[C88] N. Islah, J. Koerner, R. Genov, T. A. Valiante, G. O’Leary, “Machine Learning with Imbalanced EEG Datasets Using Outlier-based Sampling,” *IEEE Engineering in Medicine and Biology Society Conference (EMBC)*, Montreal, July, 2020.[C87] Y. Li, M. Qi, R. Gulve, M. Wei, R. Genov, K. Kutulakos, W. Heidrich, “End-to-End Video Compressive Sensing Using Anderson-Accelerated Unrolled Networks,” *IEEE International Conference on Computational Photography*, Saint Louis, Apr. 2020.[C86] G. O'Leary, J. Xu, L. Long, J. S. Filho, C. Tejeiro, M. ElAnsary, C. Tang, H. Moradi, P. Shah, T. A. Valiante, R. Genov, “A Neuromorphic Multiplier-less Bit-Serial Weight-Memory-Optimized 1024-tree Brain State Classifier and Neuromodulation SoC with an 8-Channel Noise-Shaping SAR ADC Array,” *IEEE* *International Solid-State Circuits Conference* (*ISSCC*), San Francisco, Feb. 2020.[C85] J. Koerner, G. O’Leary, T. A. Valiante, R. Genov, “Neuromodulation Biomarker Selection using GPU-Accelerated Genetic Algorithms,” *IEEE Biomedical Circuits and Systems Conference (BioCAS)*, Nara, Japan, Oct. 2019.[C84] G. O’Leary, A. Gierlach, R. Genov, T. A. Valiante, “Neural Interface System for Virtual High-Density Microelectrode Array Adaptive Neuromodulation,” *IEEE Biomedical Circuits and Systems Conference (BioCAS)*, Nara, Japan, Oct. 2019.[C83] G. O’Leary, D. Groppe, V. Barkley, R. Genov, T. A. Valiante, “Human in-Vivo Machine Learning based Acute Brain Stimulation for Epilepsy,” *IEEE Engineering in Medicine & Biology Society Conference (EMBC)*, Berlin, July, 2019.[C82] H. Ke, N. Sarhangnejad, R. Gulve, Z. Xia, N. Gusev, N. Katic, K. N. Kutulakos, and R. Genov, “Extending Image Sensor Dynamic Range by Scene-aware Pixelwise-adaptive Coded Exposure,” *International Image Sensor Workshop (IISW),* Salt Lake City, June, 2019.[C81] G. O’Leary, D. Groppe, V. Barkley, T. Valiante, R. Genov, "Human In-vivo Machine Learning Based Acute Brain Stimulation for Epilepsy," *IEEE EMBS Conference on Neural Engineering (NER’19)*, Mar., 2019.[C80] N. Sarhangnejad, N. Katic, Z. Xia, N. Gusev, G. Dutta, R. Gulve, M. Monero, M. Wei, H. Haim, D. Stoppa, K. Kutulakos, R. Genov, “Dual-Tap Pipelined-Code-Memory Coded-Exposure-Pixel CMOS Image Sensor for Multi-Exposure Single-Frame Computational Imaging,” *IEEE* *International Solid-State Circuits Conference* (*ISSCC’2019*), San Francisco, Feb. 2019.[C79] M. R. Pazhouhandeh, G. O’Leary, D. Groppe, T. Valiante, N. Verma, R. Genov, “Adaptively Clock-boosted Auto-ranging Responsive Neurostimulator for Emerging Neuromodulation Applications,” *IEEE* *International Solid-State Circuits Conference* (*ISSCC’2019*), San Francisco, Feb. 2019.[C78] G. O’Leary, I. Taras, D. Malone Stuart, J. Koerner, D. M. Groppe, T. A. Valiante, R. Genov, “GPU-Accelerated Parameter Selection for Neural Connectivity Analysis Devices,” *IEEE Biomedical Circuits and Systems Conference (BioCAS’2018*), Cleveland, Oct. 2018.[C77] M. Wei, N. Sarhangnejad, Z. Xia, H. Ke, N. Gusev, R. Genov, and K. N. Kutulakos, “Coded Two-Bucket Cameras for Computer Vision,” *European Conference on Computer Vision*, Munich, Sept. 2018.[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 Δ2Σ 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 ΔΣ 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.[C71] J. Albericio, A. Delmás, P. Judd, S. Sharify, G. O’Leary, R. Genov, A. Moshovos, “Bit-pragmatic Deep Neural Network Computing,” *50th Annual IEEE/ACM International Symposium on Microarchitecture*, Boston, Oct. 2017. [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.[C69] N. Sarhangnejad, H. Lee, N. Katic, M. O’Toole, K. N. Kutulakos and R. Genov, “Primal-Dual-Coding CMOS Image Sensor Architecture,” *International Image Sensor Workshop,* Hiroshima, May2017.[C68] M. R. Pazhouhandeh, O. Shoaei, R. Genov, “Two-electrode Impedance-sensing Cardiac Rhythm Monitor for Charge-Aware Shock Delivery in Cardiac Arrest,” *IEEE Int. Symp. on Circuits and Systems (ISCAS'2017),* Baltimore, May2017.[C67] H. Kassiri, M. R. Pazhouhandeh, M. T. Salam, J. L. P. Velazquez, R. Genov, “All-Wireless 64-channel 0.013mm2/ch Closed-Loop Neurostimulator with Rail-to-Rail DC Offset Removal,” *IEEE* *International Solid-State Circuits Conference* (*ISSCC’2017*), San Francisco, Feb. 2017.[C66] H. Kassiri, G. Dutta, N. Soltani, C. Liu, Y. Hu, R. Genov, “An Impedance-Tracking Battery-less Arbitrary-Waveform Neurostimulator with Load-Adaptive 20V Voltage Compliance,” *IEEE European Solid-State Circuits Conference (ESSCIRC’2016),* Sept. 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. **(IEEE Biomedical Circuits and Systems Technical Committee Best Paper Award).**[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 0.13μm 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*.*[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.[C22] J. N. Y. Aziz, R. Genov, B. L. Bardakjian, M. Derchansky, P. L. Carlen, “256-Channel Integrated Neural Interface and Spatio-Temporal Signal Processor,” *IEEE Int. Symp. on Circuits and Systems (ISCAS'2006)*, May 2006.[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, 3rd 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 |
|  | [A19] G. O’Leary, I. Khramtsov, R. Ramesh, AJ Perez-Ignacio, P. Shah, H. Moradi, A. Gierlach, R. Genov, T. A. Valiante, “OpenMEA: Open-Source Microelectrode Array Platform for Bioelectronic Interfacing,” Society for Neuroscience Annual Meeting, Nov, 12-16, 2022.[A18] Y. E. Hwang, R. Genov, J. Zariffa, "Demonstrating Closed-loop Control of Functional Electrical Stimulation Using Convolutional Neural Networks," Toronto Biomedical Engineering Conference, June 15, 2022. [A17] Y. E. Hwang, R. Genov, J. Zariffa, "Reducing Convolutional Neural Network Architectures for Selective Peripheral Nerve Recording on Implantable Devices," Society for Neuroscience Annual Meeting, Nov, 8-11, 2021 (virtual).[A16] W. Chen, P. Mirdehghan, R. Gulve, S. Fidler, R. Genov, K. N. Kutulakos, “Auto-Tuning Structured Light for Coded Two-Bucket Cameras by Optical Stochastic Gradient Descent,” International Conference on Computational Photography (ICCP), Haifa, Israel, May 2021. **(Best Poster Award).**[A15] G. M. O’Leary, D. M. Groppe, V. Barkley, R. Genov, T. A. Valiante, "Human In Vivo Machine Learning Based Acute Brain Stimulation for Epilepsy," IEEE Engineering in Medicine and Biology Conference (EMBC’2019), Berlin, July 2019.[A14] G. M. O’Leary, D. M. Groppe, R. Genov, T. A. Valiante, "Machine Learning-Based Seizure Prevention with Closed-Loop Brain Stimulation," 13th Annual Canadian Neuroscience Meeting, 2019, Toronto, May 2019.[A13] G. M. O’Leary, D. M. Groppe, V. Barkley, R. Genov, T. A. Valiante, "Human In Vivo Machine Learning Based Acute Brain Stimulation for Epilepsy," 9th International IEEE EMBS Conference on Neural Engineering (NER’2019), San Francisco, March 2019. [A12] G. O’Leary, D. M. Groppe, T. A. Valiante, R. Genov, "Machine Learning-Based Responsive Brain Stimulation," Society for Neuroscience Meeting, San Diego, Nov. 2018.[A11] 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, Vancouver, May 2018.[A10] 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. [A9] 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. [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  |
|  | [O10] C. Li, C. Lammie, A. Amirsoleimani, M. R. Azghadi, R. Genov, “Simulation of Memristive Crossbar Arrays for Seizure Detection and Prediction using Parallel Convolutional Neural Networks,” subm. *Software Impacts*, 2022.  [O9] A. Burdett, P. Mohseni, M. Ghovanloo, R. Genov, “Guest Editorial - Selected Papers From the 2019 IEEE International Solid-State Circuits Conference,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 14, No. 6, pp. 1179 - 1182, Dec. 2020.[O8] A. Burdett, P. Mohseni, M. Ghovanloo, R. Genov, “Guest Editorial - Selected Papers From the 2019 IEEE International Solid-State Circuits Conference,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 13, No. 6, pp. 1226 - 1228, Dec. 2019.[O7] A. Burdett, P. Mohseni, M. Ghovanloo, R. Genov, “Guest Editorial - Selected Papers from the 2018 IEEE International Solid-State Circuits Conference,” *IEEE Transactions on Biomedical Circuits and Systems*, Vol. 12, No. 6, pp. 1217-1219, Dec. 2018.[O6] A. Burdett, P. Mohseni, R. Genov, M. Ghovanloo, “Guest Editorial - Selected Papers from the 2017 IEEE International Solid-State Circuits Conference,” *IEEE Transactions on Biomedical Circuits and Systems,* Vol. 11, No. 6, pp. 1173-1175, Dec. 2017.[O5] A. Burdett, P. Mohseni, R. Genov, “Guest Editorial - Selected Papers from the 2016 IEEE International Solid-State Circuits Conference,” *IEEE Transactions on Biomedical Circuits and Systems,* Vol. 11, No. 3, pp. 485-486, Jun. 2017.[O4] D. Sylvester, D. Marković, R. Genov, A. Kawasumi, S. Mitra, “Introduction to the January Special Issue on the 2016 IEEE International Solid-State Circuits Conference,” *IEEE Journal of Solid-State Circuits,* Vol. 52, No. 1, pp. 3-7, Jan. 2017.[O3] A. Burdett, D. Ham, R. Genov, “Guest Editorial - Selected Papers from the 2015 IEEE International Solid-State Circuits Conference,” *IEEE Transactions on Biomedical Circuits and Systems,* Vol. 6, No. 6, pp. 755-757,Dec. 2015.[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.[M3] “Electronic Brain Implants for Treatment of Neurological Disorders,” Canadian Broadcasting Corporation, CBC/Radio-Canada, technology and culture radio show *Spark,* March 2011.[M2] “Pushing the Evolution of the Machine-Human Interface,” *Skulematters Alumni Magazine*, Fall, 2007. The article features Genov’s team work on integrated brain-chip interfaces. [M1] “The Race to Build a Better Brain: A New Computer Chip Pushes the Machine-Human Interface,” by D. Hawaleshka*, Maclean’s Magazine*, Vol. 120, No. 10, March 19, 2007. The article features Genov’s team work on integrated brain-chip interfaces. |
| PATENTS / IP DISCLOSURES |
|  | **Patents Granted**[P4] N. Soltani, R. Genov, “Systems, Methods and Apparatuses for In Situ Electrochemical Imaging,” International Patent application PCT/CA2016/050655 (National phase: Canada 2,988,789; Europe 16806476.4; USA 15/580,823), filed on June 9, 2016 (Priority dates of US provisional patents 62/173,066 filed on June 9, 2015 and 62/217,373 filed on Sept. 11, 2015), granted April 13, 2021.[P3] H. Kassiri, N. Soltani, R. Genov, “Neurostimulator and Method for Delivering a Stimulation in Response to a Predicted or Detected Neurophysiological Condition,” International Patent application PCT/CA2017/050867, filed on July 19, 2017 (Priority date of US provisional patent 62/364,643 filed on July 20, 2016), granted March 23, 2021.[P2] M. T. Salam, R. Genov, J. L. Perez Velazquez, “System, Method and Apparatus for Rapid Brief Feedback Intracerebral Stimulation Based on Real-Time Desynchronization,” US Patent application number 15/177,615, filed on June 9, 2016 (Priority date of US provisional patent 62/172,912 filed on June 9, 2015), granted Oct. 29. 2019.[P1] R. Genov, K. N. Kutulakos, N. Sarhangnejad, N. Katic, M. Wei, “Method and System for Pixel-Wise Imaging,” US Patent US10,229,943B2; application filed on Apr. 27 2018 (priority date of US provisional patent applications 62/491,620 filed on Apr. 28, 2017), granted March 12, 2019.**Patent Applications**[PA10] G. O’Leary, T. Valiante, R. Genov, “System and Method for Classifying Time Series Data for State Identification,” US Patent application, 2020.[PA9] G. O’Leary, T. Valiante, R. Genov, “Charge-balanced Neuromodultion Waveform Generation Using Digital Resonators,” US Patent application, 2020.[PA8] R. Genov, K. N. Kutulakos, N. Sarhangnejad, R. Gulve, H. Ke, “Method and System for Extending Image Dynamic Range Using Per-Pixel Coded Exposure,” US Patent application 62/864,895, filed on June 21, 2019.[PA7] R. Genov, G. O’Leary, “System, system architecture, and method for neural cross-frequency coupling analysis,” US Patent application 20200015692A1, filed on July 18, 2018.[PA6] G. O’Leary, R. Genov, “System and Method for Interfacing with Biological Tissue,” US Patent application 62/629,001, filed on Feb. 10, 2018.[PA5] N. Soltani, R. Genov, “Wireless Power and Data Transmission System for Wearable and Implantable Devices,” International Patent application PCT/CA2016/051169 filed on Oct. 7, 2016 (Priority date of US provisional patent 62/238,271 filed on Oct. 7, 2015).[PA4] R. Genov, M. Nazari, “Wide-dynamic-range high-throughput integrated potentiostat,” US Provisional Patent application 61/173,531, filed 04/28/2009.[PA3] B.L. Bardakjian, A. Chiu, T.T. Le, R. Genov, P.L. Carlen, M. Derchansky, “An implantable intelligent neural activity acquisition, processing and stimulation system,” US Provisional Patent, 06/08/2005. [PA2] R. Genov, “Multi-site sensory signal acquisition, processing and classification and electronic method thereof,” US Provisional Patent 60/682.821, filed 05/20/2005.[PA1] R. Genov, G. Cauwenberghs, “High-precision matrix-vector multiplication on a charge-mode array with embedded dynamic memory and stochastic method thereof,” US Provisional Patent application 10/726,753, filed 12/04/2003.**IP Disclosures** [D7] R. Genov, K. N. Kutulakos, N. Sarhangnejad, R. Gulve, H. Ke, “Method and System for Extending Image Dynamic Range Using Per-Pixel Coded Exposure,” June 20, 2019.[D6] N. Sarhangnejad, M. Wei, K. N. Kutulakos and R. Genov, “Method and System for Pixel-Wise Imaging,” University of Toronto IP disclosure, Apr. 2018.[D5] N. Sarhangnejad, N. Katic, K. N. Kutulakos and R. Genov, “Method and Apparatus for Image Sensing and Imaging Systems with Arbitrary Pixel-Wise Programmable Exposure Time,” University of Toronto IP disclosure, Apr. 2017.[D4] N. Soltani, R. Genov, “System, Methods and Apparatuses for In Situ Electrochemical Imaging,” University of Toronto IP disclosure 10002953, June 24, 2015.[D3] N. Soltani, R. Genov, “Wireless Data and Power Communication Apparatus and the Method Thereof,” University of Toronto IP disclosure 10002928, April 30, 2015.[D2] H. Kassiri, R. Genov, “System for Monitoring, Diagnostic and Control of Various Physiological Disorders and the Method Thereof **,“** University of Toronto IP disclosure 10002922, April 28, 2015.[D1] M. T. Salam, J. L. Perez Velazquez, R. Genov, “Closed-loop Deep Brain Stimulation to Anticipate and Abort Seizure Occurrence,” University of Toronto IP disclosure 10002902, March 26, 2015. |