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| **Roman Genov** |
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| 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** Jack Kilby Award for Outstanding Student Paper, IEEE International Solid-State Circuits Conference ISSCC (with H. Kassiri, the highest ranked student paper), 2018.Best Paper Award, IEEE Transactions on Biomedical Circuits and Systems (with R. Shulyzki, the top paper, one paper is selected among all published papers over two years, USD $2000 prize), 2017.Best Paper Award, IEEE International Symposium on Circuits and Systems, ISCAS (with H. Kassiri, the top paper, selected by IEEE Biomedical Circuits and Systems Technical Committee, 1687 submitted papers conference-wide), 2016.Best Paper Award, IEEE Biomedical Circuits and Systems Conference, BioCAS (with H. Jafari, the best paper overall, 199 submitted papers), 2011.AMD/CICC Student Award at IEEE Custom Integrated Circuits Conference, CICC (with M. Nazari, $200 prize, one of the highest ranked student papers, 305 submitted papers), 2010.Best Student Paper Award nomination at IEEE Biomedical Circuits and Systems Conference, BioCAS (with K. Abdelhalim, top seven student papers, 126 submitted papers), 2010.Best Student Paper Award, IEEE International Symposium on Circuits and Systems, ISCAS (with A. Nilchi, $400 prize, one of the two best student papers, 1631 submitted papers), 2009.Best Paper Award, IEEE International Symposium on Circuits and Systems, ISCAS (with A. Nilchi, the top paper, selected by IEEE Sensory Systems Technical Committee, 1631 submitted papers conference-wide), 2009.Best Student Paper Contest Finalist, IEEE International Symposium on Circuits and Systems (with F. Shahrokhi, top nine student papers out of 783 regular papers), ISCAS 2009.**National**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).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, prize $3,000), 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), 2016 and 2019. 2017 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), 2017.2015 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 |
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|  | “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.  | $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 | $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** Amirali Amirsoleimani (PhD, University of Windsor, Canada), Post-Doctoral Fellow, 2/2018-current.Mahshid Chekini (PhD, University of Geneva, Geneva), Post-Doctoral Fellow, 8/2018-current (co-supervised with Prof. E. Kumacheva).David Groppe (PhD, UCSD, USA) Post-Doctoral Fellow / Research Scientist, 09/2016-09/2019 (co-supervised with Prof. T. Valiante, 50%).Project: Machine Learning Algorithms for Closed-loop NeurostimulationZhengfan Xia (PhD, Tohoku University, Japan), Post-Doctoral Fellow, 10/2017-10/2019 (co-supervised with Prof. R. Kutulakos, 50%).Project: Digital Systems for Computational Photography Cameras**PhD Students** Navid Sarhangnejad, 9/2014-current.Maged ElAnsary, 9/2015-current.Reza Pazhouhandeh, 9/2015-current.Gerard O’Leary, 9/2017-current.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.**MASc Students** Nikita Gusev, 9/2017-current.Camilo Tejeiro, 1/2018-current.Saima Ali, 9/2017-current (co-supervised with Prof. M. Popovic).Jamie Koerner, 9/2018-current (co-supervised with Prof. T. Valiante, 50%).Liam Long, 7/2018-current (co-supervised with Profs. T. Valiante and P. Yoo).**MEng Project Students**William Isaac, 8/2018-current. Chenxi Tang, 2/2019-current.Szu-Chieh Fang, 4/2019-current.Atul Grover, 4/2019-current.Jaina Patel, 4/2019-current.Kartik Sunil Sharma, 6/2019-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 EpilepsyPreviously: 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 ImagersCurrently: 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 DesignNikola Katic (PhD EPFL, Switzerland), Post-Doctoral Fellow, 04/2016-06/2017 (co-supervised with Prof. Kutulakos, 50%).Project: Transport-aware Image SensorsCurrently: Synopsys CanadaXuan-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 NeurostimulationCurrently: Tradetone Research Labs **Former PhD Students**Karim Abdelhalim, Ph.D. Degree, 09/2007-01/2013.Thesis: Wireless Neural Recording and Stimulation SoCs for Monitoring and Treatment ofIntractable EpilepsyPreviously: 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 BiosensingCurrently: Assistant 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 Previously: 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 DisordersCurrently: 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 ChemistryCurrently: Analog and Mixed-Signal Design Engineer at Synopsis, Toronto**Former MASc Students**Ashkan Olyaei, M.A.Sc. Degree, 09/2003-04/2006.Thesis: ViPro: Focal-Plane CMOS Spatially-Oversampling Computational Image SensorCurrently: 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 ComputingPreviously: 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 InterfacesPreviously: 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 SensorPreviously: 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 PotentiostatPreviously: 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 MicrosystemsPreviously: 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 InterfacesCurrently: 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 StimulationPreviously: 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 MonitoringPreviously: 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 MicroscopeCurrently: 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 SetsCurrently: Start-up in stealth modeGerard O’Leary, M.A.Sc. Degree, 09/2015-01/2018.Thesis: Intelligent Medical Devices for Brain State Classification and Responsive NeuromodulationCurrently: 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 SensorsCurrently: Rambus**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: Computational 3-D Camera DesignAsish 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 (Val) 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   |
| UNDERGRADUATE DESIGN PROJECT AND THESIS ADVISEES |
|  | 2003-20042004-20052005-20062006-20072007-20082008-20092009-20102011-20122012-20132013-20142014-20152015-20162017-20182018-2019 | 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 Lam | (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 RESEARCH ADVISEES |
|  | 20042005200620112013201420152016201720182019 | 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 | (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) |

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

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

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| INVITED PRESENTATIONS  |
|  | “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, April. 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, March 13, 2018.“Brain Monitoring and Modulation Building next generation Responsive Brain Stimulators,” Ontario Brain Institute EpLink Workshop (with T. Valiante), Nov. 11, London, 2017.“Energy-Efficient Computational Light Transport Parsing: Programmable-pixel Image Sensors”, 18-month PI Review Meeting (with S. Narasimhan, K. Kutulakos), Arlington, VA, Sept. 26, 2017.“Electrochemical Monitoring of Epilepsy: the Technology,” Invited Talk, 2017 EpLink Fellows Meeting, University of Toronto, Faculty of Medicine, April 7, 2017. “Pixel-programmable Structured-Light CMOS Imagers,” Annual Meeting, Orlando, FL, March14, 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), 2014-2017.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.University/Department Committees Member: Electronics Group, Chair, 2015-2017.Graduate Matters Committee, 2014-2017.Examinations Committee, Faculty of Engineering, 2018-2020.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. |
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| BOOK CHAPTERS  |
|  | [BC3] D. Ho, O. Noor, U. Krull, G. Gulak, R. Genov, “CMOS Spectrally-Multiplexed FRET Contact Imaging Microsystem for DNA Analysis,” in “Handbook of Bioelectronics: Directly Interfacing Electronics and Biological Systems,” edited by S. Carrara and K. Iniewski, Cambridge University Press, 2015. [BC2] H. Bidhendi, H. Jafari, R. Genov, “Ultra-Wideband Imaging Systems for Breast Cancer Detection,” in “Ultra-Wideband and 60 GHz Communications for Biomedical Applications,” edited by M. R.Yuce, Springer, pp. 83-103, 2014.[BC1] A. Olyaei, R. Genov, “CMOS Focal-Plane Spatially-Oversampling Computational Image Sensor,” in “Circuits at the Nanoscale: Communications, Imaging, and Sensing,” edited by K. Iniewski, CRC Press, pp. 521-538, 2008. |
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| REFEREED JOURNAL PUBLICATIONS |
|  | [J50] N. Soltani, M. ElAnsary, Jianxiong Xu, R. Genov, “Safety-optimized Inductive Powering of Implantable Medical Devices: A Tutorial and Comprehensive Design Guide,” subm. *IEEE Transactions on Biomedical Circuits and Systems, 2019.*[J49] N. Guo, R. Genov, G. Gulak, D. Ho, “CMOS Image Sensor Architecture with Split-Comparator 3-T Pixels and Digital Correlated Double Sampling,” subm., *IEEE Access*, 2019.[J48] 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*, 2019.[J47] 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,” subm. *IEEE Journal of Solid-State Circuits,* 2019.[J46] N. Sarhangnejad, N. Katic, Z. Xia, M. Wei, N. Gusev, G. Dutta, R. Gulve, P. Z. H. Li, H. F. 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,* 2019.[J45] 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,” subm. *IEEE Journal of Solid-State Circuits,* 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**) |

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| REFEREED CONFERENCE PUBLICATIONS |
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