JAN VAN der SPIEGEL
University of Pennsylvania
Department of Electrical and Systems Engineering
200 S. 33rd Street
Philadelphia, PA 19104-6314

(215) 898-7116
206-202-1357 (Fax)
jan@seas.upenn.edu
http://www.seas.upenn.edu/~jan
Google Scholar: https://tinyurl.com/VanderSpiegelPapers

POSITION: Professor of Electrical and Systems Engineering
Director of the Center for Sensor Technologies
Deputy Department Chair

Senior Visiting Professor, Institute of Microelectronics, Tsinghua University (Sept, 2017-Feb. 2018)

EDUCATION: Katholieke University of Leuven (Belgium)

1969-1971 Candidate in Engineering with great distinction.

1971-1974 Master of Engineering in Electrical Engineering (Electro-Mechanical Engineering) with the greatest distinction.
Thesis Title: *Study of Diffraction Gratings for Coherent Optical Pattern Multiplication*.

1974-1979 Doctor in Electrical Engineering with the greatest distinction.
Thesis Title: *Charge-coupled Imaging Devices.*

Languages: Dutch, English, French and German

HONORS AND AWARDS:

- General Conference Chair of the IEEE ISSCC 2019 and ISSCC 2020
- Life Fellow of the IEEE (2016-)
- IEEE TbioCAS Best Paper Award
- IEEE 2015 Biomedical Circuits and System Conference Best Paper Award, 2015
- 2014 ISCAS Best Paper Award of the BIOCAS Track, June 2014.
- Ford Motor Company Award for Faculty Advising, May 2012
- Associate Editor for the IEEE Transactions on Biomedical Circuits and Systems (TBCAS) 2011 - present
- IEEE Solid-State Circuits Society Outstanding Contribution Award, 2008
- 2007 Best Paper Award at the IEEE Circuits and Systems, Sensory Systems Track.
- IEEE Educational Activities Board Major Educational Innovation Award, 2007.
- Technical Program Chair, IEEE Int. Solid-State Circuits Conf., 2007.
- IEEE Fellow, 2002.
- IEEE Third Millennium Medal, 2000.
- Recipient of the UPS Foundation Distinguished Educator Chair (1998-1999)

- Distinguished Lecturer, IEEE Solid-State Circuit Society (1999-2003) and (2013-2018)
- Recipient of the Bicentennial Class of 1940 Term Chair, 1991-96
- Christian and Mary Lindback Foundation Award for Distinguished Teaching, University of Pennsylvania, 1990
- S. Reid Warren Award for Distinguished Teaching 1987, School of Engineering & Applied Science, University of Pennsylvania
- Presidential Young Investigator Award, 1984
- IBM Faculty Development Award, 1983 and 1984
- Award for the best thesis in Electrical Engineering 1974, Royal Flemish Eng. Soc.
- Masters of Arts honoris causa, University of Pennsylvania, Sept. '88
- Who is Who in Technology; Who is Who in America.
- Senior Member, IEEE (since 1990)
- Phi Beta Delta Honor Society of International Scholars (Founding Member, 1990)
- Tau Beta Pi (Eminent Engineer, 1991)

JOURNAL EDITORSHIP

- Editorial Board of the Proceedings of the IEEE (January 1, 2015 till present)
- Section Editor, Journal of Engineering, Institute of Engineering and Technology (IET), section Electrical and Electronic Engineering, 2013- (Open Access journal)
- Associate Editor for the IEEE Transactions on Biomedical Circuits and Systems (TBCAS) 2011 – present
- Guest Editors, Special issue on "Bioinspired Imaging," Proc. of the IEEE, Oct. 2015
- Editorial Board (Associate Editor), Journal of Electrical and Computer Engineering, 2009-2014
- Editorial Board, J. of Engineering, Hindawi Publ. Corp, 2012-2014
- Guest Editor, IEEE J. Solid-State Circuits, January 2006 issue
- Editor for North and South America of Sensors and Actuators A (1983-2004)
- Editorial Board of the International Journal of High Speed Electronics
- Editorial Board of the Journal of the Brazilian Microelectronics Society

FELLOWSHIPS:

1974-1975	Belgian Institute for Scientific Research in the Industry and Agriculture (IWONL).
1975-1979	Belgian National Science Foundation (NFWO).
1983	University of Pennsylvania, Summer Research Fellowship.
	Fulbright travel grant for cooperative research between University of Pennsylvania and Katholieke University of Leuven.

POSITIONS HELD:

Professor of Electrical and Systems Engineering

- Senior Visiting Professor, Tsinghua University, (9/17-2/18)
- Director of Center for Sensor Technologies (7/89 - Present)
- Director of the Rachleff Scholars Program (2008-present).
- Director for Undergraduate Research (2016-present)
- Associate Dean for Education (7/2011-6/2015)

- Associate Dean for Professional Programs (7/2015-2016)
- Director for Undergraduate Research (7/2016-present)

University of Pennsylvania
Department of Electrical and Systems Engineering, Center for Sensor Technologies.
Research: Integrated vision sensors; brain-machine interface circuits; hardware implementation of neural network-based systems.

2/02- 12/2004 *Professor and Interim Chair*, Department of Electrical and Systems Engineering, University of Pennsylvania

7/98 – 2/2002 *Professor and Chairman*, Department of Electrical Engineering

7/87 - 6/95 *Associate Professor*
Department of Electrical Engineering, University of Pennsylvania
Director, Microfabrication Laboratory (7/89-99)

7/1992 - 6/ 98 *House Master,* Ware College House, University of Pennsylvania

1991 - 7/1992 *Faculty Fellow*, Ware College House, University of Pennsylvania

1989 *Visiting Professorship* at the Scuola Superiore S. Anna, Pisa, Italy, March 1989.

7/81 - 6/87 *Assistant Professor*
University of Pennsylvania
Department of Electrical Engineering, Center for Chemical Electronics.

Research: Fabrication technology for sensors and IC's; integrated sensors; fast thermal processing of silicides.

12/81 - 8/82 *Research Supervisor*
Katholieke University of Leuven (Belgium)
Department of Electrical Engineering - ESAT Laboratory.
Research: High resolution linear charge-coupled device cameras; a 512 element CCD for a focal plane bread-board model and a prototype 2048 element CCD.

11/80 - 6/81 *Post-doctoral Fellow* - **University of Pennsylvania**
Department of Electrical Engineering and Science, Center for Chemical Electronics
Ion-controlled diode for use in geothermal fluids: Theoretical and experimental work on corrosion resistive barrier layers. Fabrication and characterization of Ni and Mo silicide layers for use in fluids at a temperature of 250°C and pressures up to 5000 psi.

9/79 - 10/80 *Reserve Officer* (Rank: Second Lieutenant).
Advanced Training Center of the Belgian Airforce
Teaching: Mathematics, Physics, Electronics and Microcomputers.

Wrote a textbook on "Microprocessors" for internal use in coursework.

PRINCIPLE RESEARCH INTERESTS:

- Integrated and smart sensors; hardware implementation of biologically inspired vision sensors and systems; brain-machine interface circuits.
- Advanced microfabrication technologies

PROFESSIONAL AND SOCIETY MEMBERSHIPS:

- Institute of Electrical and Electronic Engineers (IEEE) – Live Fellow (2016-)
- President of the IEEE Solid-State-Circuits Society (SSCS) (2016-1017);
- Institute of Electrical and Electronic Engineers (IEEE) – Fellow (2002-2016)
- Member of the IEEE Circuits and Systems Society (CAS), Electron Device Society (EDS) and Solid-State Circuits Society (SSCS)

TEACHING EXPERIENCE:

University of Pennsylvania:

- Overview of the frontiers of CMOS Technology and Applications, Tsinghua University
- ESE200/ESE170: Principles of Digital Logic
- ESE201/ESE171: Digital Logic Laboratory
- EE205: Electrical Circuits and Systems Laboratory I
- ESE206: Electrical Circuits and Systems Laboratory II
- EE212: Fundamentals of Circuit, Signals and Systems
- EE215: Electrical Circuits and Systems I
- ESE216: Electrical Circuits and Systems II
  ENGR299: Research Methods in Engineering
- EE319: Fundamentals of Solid-State Circuits; CMOS analog circuits
- EE442: Senior Design Project (supervised 55 projects)
- EE471: Digital Integrated Circuits (new course, introduced 1983)
- EE522: Fundamentals of Sensor Technologies - I (new course, introduced 1991)
- ESE450 and ESE451: Senior Design Project (2016-)
- EE560: Digital Integrated Circuits and VLSI - Fundamentals
- EE562 & EE419: Analog Integrated Circuits
- EE899: Graduate Independent Study
- EE099: Undergraduate Independent Study
- EMTM640: Microelectronics
- EMTM650: Emerging Technologies (Coordinator)
- EMTM ETS: Emerging Technology Lecture Series (Coordinator)

Coordinator/Director of the summer program for Undergraduates since 1986. Over 260 students have participated in this program.

Nassau Awards:

- Granted to Mr. J. Foo for work on "Piezoelectric Copolymers for Sensor Applications," 1987
- Granted to Ms. Naomi Takahashi for work on "Two-Dimensional Motion Detection Algorithm Using Spatiotemporal Filters," 1995.

- Granted to Mr. Lin Ping Ang for work on ""The ENIAC versus Modern Computers: A Comparative Study of Computer Architectures", Dec. 1995.

Rose Award:

- Granted to Messrs. T. Chiu and C. Donham for research on "A VLSI Based Programmable Synaptic Array," May, 1989

Saitama University, Japan (July, 1994): Digital Integrated Circuits

Advanced Training Center of the Belgian Air Force:

- Mathematics
- Physics
- Electronics
- Informatics
- Northampton Community College, Bethlehem, PA
- Micro-electronics Fabrication Technology

DISSERTATIONS/THESES SUPERVISED:

Ph.D.:

1. Rapid Thermal Annealing of Metal Silicides (C.S. Wei, Sept. 1986) (Received the Stein Award for best thesis in Materials, 1987) Worked at INTEL Corp. Advanced Semiconductor Components Lab, Santa Clara, CA for 4 years before joining Taiwan Semiconductor Manufacturing Company, Taipei, R.O.C.)
2. Experimental Evaluation of Ternary Systems for VLSI Microelectronics (Michael Setton, July, 1990). Currently working at Market/Technologies Advancées in Paris, France
3. Study of the Formation and Characteristics of Al/TiW/$TiSi_2$ Contacts to Shallow Junctions (R. Furlan, co-advisor with J. Swart, Univ. of Sao Paõlo, Brazil, July, 1990). Currently working as assistant professor at the Dept. Electrical Engineering, Univ. of Sao Paõlo, Brazil
4. Structure and Transport of Epitaxial Raw Earth Silicides (Forrest H. Kaatz, December, 1991). Formerly at the Naval Research Labs in Washington, DC, currently at Mesa Technical College, Math and Physical Science Dept, Tucumcari, NM.
5. A Treatise on Log-Polar Imaging Using a Custom Computational Sensor (Gregory L. Kreider, August 1993). Working at Philips Research Labs. in Eindhoven, the Netherlands .
6. Biologically Motivated Analog VLSI Systems for OptomotorTasks (Ralph Etienne-Cummings, September 1994). Professor at John Hopkins University.
7. Low-Noise, Low-Power, and High-Speed Charge Sampling Mixed-Signal Integrated-System for Detector/Sensor Interfaces (Suharli Tedja, October 1994). Working at AT&T Bell Laboratories as a member of the Technical Staff, Allentown, PA; currently at Lucent's Mass Storage IC Design Center in Fremont, CA.
8. Design and Implementation of a General Purpose Analog Neural Computer and Its Application to Speech Recognition (Chris Donham, January 1995).Working at Silicon Graphics, Inc., Mountain View, CA.

9. Multi-band Oversampled Noise Shaping Analog to Digital Conversion (Pervez Aziz, May 1996). Working at Lucent Technologies as member Tech. Staff, Murray Hilll, NJ.
10. Auditory-Based Acoustic-Phonetic Signal Processing For Robust Continuous Speech Recognition (Ahmed M. Abdelatty, December 1999) - received the Stein Award. Senior Design Engineer at Analog Devices
11. Low Noise Electronics for Ionization Detectors (Sergio Rescia, December 2000). Working at Brookhaven National Lab.
12. Low-Voltage Low-Power CMOS Delta-Sigma A/D Converter Design, (Qunying Li, December 2000) - working at Texas Instruments, NJ, as design engineer. Co-supervised with Dr. K. Laker.
13. A VLSI Computational Sensor for the Detection of Image Features (Masatoshi Nishimura, March 2001); working at Sankyo, Japan.
14. Timing Jitter/Phase Noise in Phase-Locked Loop (PLL) Modeling and Multi-GigaHz PLLs Design (Chao Xu, March 2002); working at Integrated Devices Technology, Inc, design engineer. Co-supervised with Dr. K. Laker
15. Background Calibration of Pipelined Analog to Digital Converters (Sameer Sonkusale, August 2003), currently on the faculty as associate professor at Tufts University, Dept. Electrical Engineering.
16. Mixed-Signal Design for a Silicon Cort-X, A Pathway to an Artificial Brain, Jie Yuan, (August 2006), Associate Professor at the Hong Kong University of Science and Technology since Aug. 2006. (co-advisor with Prof. N. Farhat).
17. Zheng Yang, CMOS Image Sensors, November 2012. Design Engineer at Omnivision, CA.
19. Chengjie Zuo, AlN Resonators and Oscillators, co-supervision with Prof. Gianluca Piazza, Qualcomm.
20. Xiaotie Wu, High Performance Optical Transmitter For Next Generation of Supercomputing And Data Communication, August 2013; Design Engineer at Qualcomm.
21. Hongjie (Matt) Zhu, Smart Sensor Networks for Sensor-Neural Interface (May 2017); Design Engineer at Avago Technologies (formerly Broadcom).
22. Xilin Liu, A Closed-Loop Biderectional Brain-Machine Interface System for Freely Behaving Animals, May 2017; Design Engineer at Qualcomm.

MSE:
- Shielded Piezoresitive Tactile Sensor Array (Kaichong Wong, August 1985)
- Automated System for Chemical Sensor Analysis in Dental Applications (S-Y.Wang, December 1985)
- Correlated Double Sampling Instrumentation Amplifier (Gregory Kazmierczak, May 1986)
- Integrated Tactile Sensor Array and a CMOS Signal Conditioning System (Zong-An Chen, September 1986)
- Design, Simulation and Fabrication of a Monolithic Fluid Flow Thermal Sensor (G. Alach, December 1986)
- Pseudo-Binary Solid-Solutions and Ternary Silicides (Michael Setton, May 1987)
- Rapid Thermal Processing of Sputtered Titanium on Silicon Using a Hg-Xe ARC Lamp (K.J. Kim, May 1987)

- Multichannel Integrated Oxygen Sensing Systems (C. Tong, December 1987)
- Design and Implementation of a Time-to-Voltage Converter/Analog Memory for Colliding Beam Detectors (Andrew Stevens, May 1988)
- Analysis of a Common Base and Common Emitter Input Configuration for a High Speed Bipolar Shaping Amplifier (Peter Hottenrott, May 1988)
- Design and Implementation of High-Speed Low-Power Operational Transconduction Amplifiers (Vincentius Budihartono, May 1990)
- A (PVDF-TrFE) Based Ultrasonic Transducer (Diana Esmail-Zandi, May 1990)
- Study of Co^{60} Irradiation on 1.6 μm CMOS Devices (Tao-Yin Yau, May 1990)
- Target Tracking with a Retina-Like Spatially Variant Sensor (Thomas Deitrich, May 1991)
- Analog and Digital Design Algorithms for an Auto-Tracking Robotic System (Thomas A. Mostek, May 1994)
- Asynchronous Signal Latch for Use with Boundary-Scan Protocol Test Access Port (Tor L. Ekenberg, December 1994)
- Monolithic Eniac (James F. Tau, August 1996).
- Pipeline Analog to Digital Converter, Barkat A. Wani (Dec 2005)
- Pinhung Lin, Analog to Digital Converters (August 2005)
- Alper Meric, Analog to Digital Converters, starting May. 2007.
- Nishant Doshi, Front-End Amplifier and Shaper Circuit for High Energy Particle Detectors (Dec 2007)
- Leon Herman, Lab on a Chip Field Programmable Transistor Array (with Ken Laker) (August 2009)
- Le Huang, Low-Power Low-Noise Integrated Amplifier for Biomedical Applications (May 2010)
- Shang Wei, Organic Transistor Circuits, (August 2010)
- Andrew Townley, An Upgraded Preamplifier Design for the ATLAS LAr Readout Chain (May 2011)
- Kui Cao, Spice Modeling of Organic Field Effect Transistors (May 2011)
- Wanqing Xin, Low Power Transceiver for Intra-Body Communication, May 2015
- Han Hao, Integrated Filter for Brain-Machine Interfaces, May 2017
- Jiahe Chen, Closed-Loop Neural Stimulator System, May 2019, currently PhD student at Cornell University

Student Awards:

- G. Kreider for best student paper at the Symposium for Innovation in Measurement Science (SIMS '89), Instrument Society of America, August 6-11, 1989, Geneva, NY: "A Retinal Sensor Featuring a Circular Layout and Radially Varying Resolution".
- F. Kaatz, finalist of the Materials Research Society Student Award, Fall meeting, Boston, MA, November 1989 for paper on "Epitaxial Growth of Rare Earth Silicides".

- F. Kaatz, Outstanding Student Paper Award of the American Vacuum Society, Thin Films Division, October 1990.
- A. Ali, Stein Award for his Ph.D. work, Univ. of Pennsylvania, May 2000. *Current Theses Supervision:*
- Chengjie Zuo, IEEE Solid-State Circuits Society Predoctoral Fellowship, 2009-2010

Former Graduate Students who are Faculty at other Universities:

- Ralph Etienne-Cummings, Professor at J. Hopkins University, Dept. of Electrical Eng.
- Sameer Sonkusale, Assistant Professor of Electrical Engineering at Tufts University
- Jie Yuan, Associate Professor at Hong Kong University of Science and Technology, Hong Kong.
- Athanasios Mouchtaris (Post Doc) Professor at the Computer Science Dept. of the University of Crete.
- Victor Gruev (Post Doc), Associate Professor at the Univ. of Illinois, Urbana Champaign (UIUC), Electrical and Computer Eng. Dept.
- Milin Zhang (Post Doc), Assistant Professor of Electronic Engineering at Tsinghua University, China
- Chengjie Zuo, Professor at the School of Microelectronics, University of Science and Technology of China (USTC)

POST DOCs

- Athanasios Mouchtaris (Ph.D. USC, 2002), May 2003-June 30, 2004. Currently Assistant Professor at the Computer Science Dept. of the University of Crete and also at Institute of Computer Science, Foundation for Research and Technology in Heraklion, Crete, Greece
- Viktor Gruev (PhD, J. Hopkins Univ., 2004), Oct. 2004-July 2008. Assistant Professor at Washington University, St. Louis (August 2008).
- Shih-Schon Lin (Ph.D Univ. of Pennsylvania), Sept. 2008-August 2009. Emergent Views, Inc, Senior Researcher.
- Milin Zhang (Ph.D Hong Kong Univeristy of Science and Technology, Jan. 2011-Jan. 2016; currently an Assistant Professor at Tsinghua University, China.

ADMINISTRATIVE RESPONSIBILITIES:
University Committees:

- Provost Staff Conference Subcommittee (2011-2016)
- Advisor of University Scholars (1984-2016)
- Trustees' Council of Penn Women's 25th Anniversary Award for Excellence in Advising selection committee (2012-2014)
- Provost Fellowship Review Committee, 2014-2016
- Study Abroad Advisory Committee for Northern and Central/Eastern Europe (2002-2004)
- Penn-Leuven Exchange Committee (Chair) (1983-2000)
- Provost's Award for Distinguished Ph.D. Teaching and Mentoring 2003-2005.

- Faculty Associate of Hill College House, 2003-2004.
- Self-study of graduate (PhD) education -Committee on the Degree requirements, Rules and Regulations. (2002-2003)
- Search Committee, Faculty Position at the Dept. of Sociology and History of Science (2002-2003).
- Search Committee Faculty Master, Hill College House (Chair, 2002)
- Graduate student teaching award committee (2000, 2001)
- Committee on Distance Learning (9/99-12/99)
- Council of Faculty House Masters (7/1992-6/98)
- Committee on Student Affairs (University Council; Fall 1995-1996)
- Pieter Breughel Committee, Dutch Studies Program (1986-1995)
- Subcommittee on Peer Educational Experience (PCUE; Provost Council on Undergraduate Education (Spring 1995)
- Student Awards Committee (1993-1994)
- Penn Commission to Strengthen the University Community (1993-94)
- Faculty Representative on Senate Executive Committee and University Council
- (Fac. Constituency #19) (1989-1993).
- Provost's Council on International Programs (1991-1992)
- Provost's Task Force on Study Abroad Programs (Provost's Council; 1991-1992)
- Advisory Committee of the General Clinical Research Center of the School of Dental Medicine (1986-1991)
- Policy Board of WXPN-FM (1990-1991)
- Committee on Committees of the Faculty Senate (1990-1991)
- University Council Facilities Committee (1985-1987)
- Facilities Subcommittee on Energy (Chair) (1986-1987)
- Task Force on the International Dimension of the University (1984-85)
- IBM Grant Steering Committee (1986-1989)
- Board of Advisors of the International Programs Office (1983-1986)

School of Engineering and Applied Science Committees:

Present: SEAS-ABET Committee
Director, Rachleff Engineering Honors Program (2008 to 2018)
PhD Committee: VLSI section
Littlejohn Program coordinator
Academic Performance committee
Director of Undergraduate Research

Past:

- Administrative Committee (AdCom) (1998-2004)
- Task Force on Nano scale Engineering (2000)
- Search committee for Nano technology (2001-02)
- Executive Committee, Center for Nanostructure and Science
- Undergraduate Affairs Committee (1994-1997)
- Foreign Programs Coordinator SEAS/Univ. Leuven (1984-90)
- Executive Committee of the Executive Master's Program (1988-1994)

- Faculty Secretary (1991-1992)
- Faculty Council (1991-1992)
- Ad-Hoc Committee to review ExMSE Program (Chair, 1990-1991)
- SEAS-Penn 250th Anniversary Committee (July 1989-1990)
- Task Force of SEAS Council to Codify the Status of Emeritus Professors (1990)
- Academic Performance Committee (1985-1987)
- Study Committee on EES/SE merger (1982-1983)

Electrical Engineering Committees:

Present:

- ESE ABET Committee (2003-present)
- Departmental Honors committee
- Deputy Department Chair

Past:

- Faculty Search Committee
- ESE Renovation Committee (2005-present)
- PhD Qualifying Exam Committee (2004-2005)
- PhD Admission Committee (2004-2005)
- ESE Interim Chair (2002-12/2004)
- EE Chairman (1998-2002)
- EE self-study committee (2000; chair)
- Undergraduate Programs and Curriculum Committee
- EE Undergraduate lab (RCA lab)
- Solar Car Project (1994-1995)
- Undergraduate Curriculum Chairman (1994-1997)
- EE Undergraduate Curriculum and Program Committee (1992-1993)
- Review Committee of the Ph.D. Qualifying Examination (1993)
- EE Long Range Planning Committee (1985-1992)
- Microfabrication Lab Committee (chair) (1985-present)
- Ph.D. Qualifying Exam (1989-1991; Chair-1990 exam)
- EE/MSE Electronics and Photonics Materials Committee (1985-1990)
- Appointment and Promotion Committee (1987-1989)
- Undergraduate Lab Resources and Programs (1988-1989)
- Search Committee A.F. Moore Professor of Telecommunications Systems (1988-1989)
- EE/CIS VLSI Committee (1985-1987)
- Undergraduate Curriculum Committee (1984-1985)
- Committee on the Moore School Academic Electronics and Systems Labs (1984-1985)
- Committee on the Relationship Between EE and Industry (1984-1985)
- Committee on Advanced Course Offerings in Digital and Analog Circuits (1983-1984)

PROFESSIONAL ACTIVITIES:

Current:

- Conference Chair of the IEEE International Solid-State Circuits Conference (ISSCC, 2018-2020).
- General Co-Chair of the 15th IEEE 2020 International Conference on Solid-State Circuits and Integrated Circuit Technology (ICSICT), Kunming, China, November 3-6, 2020.
- General Co-Chair of the 13th IEEE International Conference on ASIC (ASICON), Chongqing, China Oct.29-Nov. 1, 2019.
- Technical Advisory Board of the International Conference of System on a Chip (SoC), San Diego, October 16-18, 2019.
- International Technical Advisory Committee of the 2nd IEEE International Conference on Integrated Circuits, Technologies and Applications (ICTA 2019), November 2019, Chengdu, China
- Member of the International Review Committee of the Electronics Engineering Department of Tsinghua University (2018)
- Member of the Franklin Institute's Committee on Science and the Arts (2015-present).
- General co-chair, "IEEE International Conference on Integrated Circuits, Technologies and Applications (ICTA2018 and ICTA2019)
- Member Program and Organizing Committee, "IEEE International Conference on Integrated Circuits, Technologies and Applications (ICTA2019)"
- Member of the International Advisory Board of the International Center for Future Chips (ICFC), Tsinghua University (2017-present)
- President of the IEEE Solid-State Circuits Society (Jan. 2016-Dec. 2017)
- Past-President of the IEEE Solid-State Circuits Society (Jan. 2018-Dec. 2019)
- President-Elect of the IEEE Solid-State Circuits Society (Jan. 2014-Dec. 2015)
- General Co-Chair of the 12th IEEE International Conference on ASIC (ASICON), Guiyang, China Oct.25-28, 2017.
- Technical Program Committee of the International Conference on Solid-State and Integrated Circuits and Technology, (ICSICT) Hangzhou, China, Oct. 25-28. 2016
- Member of the External Review Board, ECE Department, Johns Hopkins University (2015-present).
- Member of the International Advisory Committee of the 2014 International Conference on Electrical and Computer Engineering (ICECE), December 20-22, Dhaka, Bangladesh.
- Member of the External Advisory Board, ECE Department, Tufts University (2013-present).
- Elected Member of the IEEE Solid-State Circuits Society (SSCS), Jan. 2004-2007 and Jan. 2007-2010.
- Chapter Chair, Solid-State Circuits Society, IEEE (1998- 2015)
- Member, Executive Committee of the IEEE International Solid-State Circuits Conference, 1982 - present.

- Distinguished Lecturer, IEEE Solid-State Circuits Society (1999-2003; 2015-present).
- Editorial Board of the J. Electrical and Computer Engineering
- IEEE ISSCC Student Research Preview committee chair (2009- 2016)

Past:

- Member of the International Steering Committee of the 8th Electronic Devices and Solid State Circuits Conference (EDSSC)
- General co-Chair of the 9th IEEE International Conference on ASIC (ASICON 2011); Xiamen, China.
- Member of the Technical Advisory Board of the International System-on-Chip (SoC) Conference 2011.
- Technical Program Chair of the International Solid-State Circuits Conference (ISSCC2007).Member awards committee (IEEE Fellows selection) of the IEEE SSCC (2004-2008).
- Guest Editor, IEEE Journal of Solid-State Circuit, Special ISSCC05 issue (Dec. 2005).
- Member, Sensory Systems Technical Committee, CAS, IEEE.
- Member review board of the RIKEN Bio-Mimetic Control Research Center in Nagoya, Japan (2005)
- International Steering Committee of the IEEE Electron Devices and Solid-State Circuits Conference (EDSSC), Hong Kong, Dec. 16-18, 2003 and 2005.
- Secretary of the IEEE International Solid State Circuits Conference (IEEE-ISSCC), Apr. 2001-2005
- Technical Program Vice-Chair of the IEEE Int Solid State Circuits Conference (ISSCC), 2006.
- Member of the IEEE Intern. Symposium on Circuits and Systems (ISCAS, May 2002), Subcommittee on Sensors, and MEMS
- Member, Program Committee of the IEEE International Solid- State Circuits Conference (sub-committee on Emerging Technologies), 1991 - 2004.
- Liaison between the U.S. and Europe for the IEEE International Solid State Circuits Conference, 1984 - 2004.
- Member International Steering Committee of the 2003 IEEE Conf. On Electron Devices and Solid-State Circuits, Hong Kong, Dec. 16-18, 2003.
- Program committee of the International Conference on Solid-State and Integrated-Circuits Technology (ICSICT), Shanghai, Oct. 2001.
- Chair of Sub-committee on Neural Systems of the Tech. Program Committee of IEEE ISCAS 1998.
- Member Program Committee of the Microelectronic Systems Education Conference, 1997.
- Member, Technical Program Committee of the IEDM, Subcommittee on Detectors, Sensors, and Displays (1992 - 1994)
- Advisory Board of the Manufacturing Processes and Sensor Technologies (TAC) of the Ben Franklin Technology Center of Southeastern Pennsylvania, 1990 - 1995.
- Member, International Advisory Committee of the Brazilian Micro-Electronics School (Micro Electronics Society), 1988 - present.

- Organizer and Chairperson of session on "Intelligent Sensors and the Smart House," Eastern Communications Forum ECF92, National Engineering Consortium, Rye, NY, May 3-6, 1992.
- Chairman of the Committee on VLSI and Technology of the 1989, 1990, 1991 IEEE International Conference on Computer Design, Cambridge, MA.
- Member, Executive Committee of the IEEE ICCD Conference (1989-1991).
- Member, Advisory Committee of the Instrumentation Division of Brookhaven National Laboratory, NY (1990 - 1992).
- Organizer, Alumni/Faculty Exchange on "Robots of the Next Generation -How Bright Will They Be?", University of Pennsylvania, May 19, 1990.
- Session Chairman on "Sensors and Imagers: International Solid-State Circuits Conference, ISSCC'89, New York, Feb. 15-17, 1989.
- Co-Chair. of the Microsensor and Catheder-Based Imaging Tech. Conf., 0-E/Lase'88, Los Angeles, January 1988 and O-E/Lase '89, Jan. 1989.
- Vice-Chairman of the Committee on VLSI and Technology for the 1986, 1987, and 1988 IEEE International Conference on Computer Design.
- Session Co-Organizer on "Interface Electronics for the Superconducting Supercollider" Symp. Innovation Measurements Science, Geneva, NY, August 1-6, 1988.
- Organizer and Chairman, Special Sensor Session at the International Symposium of Circuits and Systems (ISCAS'87), 1987.
- Session Co-organizer on Smart Sensors and Expert Systems, Symp.for Innovation in Measurement Science, Geneva, New York, August 2-7, 1987.
- Member of the Organizing Committee on the First International Symposium of ULSI Science and Technology; Electrochemical Society, 1987.
- Session Vice-Chairman on Advanced Manufacturing at the first International Symposium on Ultra Large Scale Integration Science and Technology, the Electrochemical Society, Philadelphia, May 1987.
- Member of the organizing committee and the International Advisory Committee of the International Conference on Fast Analog Integrated Circuits for Particle Physics, Philadelphia, March 1987.
- Invited sub-plenary speaker at the lst Microelectronic Congress of the Brazilian Microelectronics Society, Compinas, July 1986.
- Organizer of special session on Sensors at the IEEE International Conference on Computer Design, Rye Brook, NY, October 1985.
- Organizer of International Summer School on Solid-State Sensors and Transducers, Katholiek Univ. Leuven, Belgium, June 1982.
- Editor, Course Notes, Volumes I and II on "Solid-State Sensors and Transducers," 1981.

REFEREE:

- NSF Review Panels
- Thin Solid Films
- IEEE Transactions on Electron Devices
- IEEE Transactions on Circuits and Systems
- IEEE Journal on Solid State Circuits
- IEEE Transactions on Neural Networks
- IEEE Computer Society Press Publications
- IEEE IEDM Conference

- IEEE ISSCC Conference
- International Neural Network Conference - INNC'90
- IEEE ICCD Conference 1990-1991
- International Joint Conference on Neural Network - IJCNN'91
- IEEE International Solid-State Circuit Conference
- IEEE International Symposium on Circuits and Systems (ISCAS)
- Ben Franklin Partnership of Southeastern Pennsylvania

CONSULTING ACTIVITIES:

- Integrated Ionics, Inc.(spin-off of research)
- Century IV Partners
- Applied Concepts, Inc.
- I-STAT Corporation
- Corticon, Inc. (Co-founder)
- NIM, Inc.
- Brookhaven National Laboratory
- Advanced Technology Center of Southeastern Pennsylvania
- Lockheed Research Laboratories
- NASA Lyndon Johnson Space Center
- Moses & Singer, New York

PATENTS:

1. "Integrated Ambient Sensing Devices and Methods of Manufacture," U.S. Patent No. 4,739,380, April 19, 1988.
2. "A General Purpose Neural Computer", U.S. Patent No. 5,155,802, October 13, 1992.
3. "Radiation-Sensitive Sensor Having a Plurality of Radiation Sensitive Elements Arranged Substantially Circular with Radially Decreasing Density", U.S. Patent No. 5,166,511 (November 24, 1992) (Eur. Appl. NR. 90201171.7).
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120. “A Multi-Frequency Tunable and Reconfigurable RF Receiver Based on Piezoelectric AlN Contour-Mode MEMS Resonators,” Chengjie Zuo, Matteo Rinaldi, Jan Van der Spiegel and Gianluca Piazza, submitted to RFIC 2011.

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122. “Aluminum Nitride Reconfigurable RF-MEMS Front-Ends,” A. Tazzoli, M. Rinaldi, C. Zuo, N. Sinha, J. Van der Spiegel, G. Piazza, presented at the 9th International Conference on ASIC (ASICON 2011), Xiamen, China, October 25-28, 2011.

123. “Design of a Monolithic CMOS Image Sensor Integrated Focal Plane Wire-Grid Polarizer Filter Mosaic,” Xiaotie Wu, Milin Zhang, Jan Van der Spiegel, *Custom Integrated Circuits Conference (CICC), 2012 IEEE* , vol., no., pp.1-4, 9-12 Sept. 2012.

124. "High Linearity Current Mode Image Sensor," Xiaotie Wu, Milin Zhang, Jan Van der Spiegel, Proc. 2012 IEEE Conference on Electron Devices and Solid-State Circuit (EDSSC), Bangkok, Thailand, Dec, 204, 2012.

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126. "A 20Gb/s NRZ/PAM-4 1V transmitter in 40nm CMOS driving a si-photonic modulator in 0.13um CMOS," Xiaotie Wu, Jan Van der Spiegel, Kal Shastri, Bipin Dama, Prakash Gothoskar, Mark Webster, Sanjay Sunder, Peter Metz, Will Wilson, Yifan Wang, IEEE International Solid-State Circuits Conference (ISSCC 2013), San Francisco, February 17-21, 2013.

127. X. Liu, M. Zhang, J. Van der Spiegel, "A Low Power Multi-Mode CMOS Image Sensor with Integrated on-Chip Motion Detection", IEEE International Symposium on Circuits and Systems (ISCAS), 2013 (Accepted).

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129. X. Liu, B. Subei, M. Zhang, A. Richardson, T. Lucas, J. Van der Spiegel, "The PennBMBI: a General Purpose Wireless Brain-Machine-Brain Interface System in Unrestrained Animals", IEEE International Symposium on Circuits and Systems (ISCAS), p 650-3, 2014; Melbourne, Australia, June 2014; *Received the 2014 ISCAS Best Paper Award of the BIOCAS Track*.

130. N. Cui, M.Zhang, N, Engheta, J. Van der Spiegel, "Design of a Current Mode Polarization Arithmetic Analyzer", IEEE International Symposium on Circuits and Systems (ISCAS), Melbourne, Australia, June 2014.

131. Design of a Foldable Architecture Integrated Smart Tiles (Poster Presentation) Hongjie Zhu, Milin Zhang, Nader Engheta & Jan Van der Spiegel, Dengteng Ge, Luciano Drummond, Jerry Chee, Serena Jiang & Shu Yang, Martin Miller, Giffen Ott, Andrew Lucia & Jenny Sabin; EFRIFEST: Workshop on Foldable, Buildable, & Responsive Materials from the micro scale to the building scale at Penn on 22-23 August, 2014.

132. Low Cutoff Frequency Integrated Neural Amplifiers Using Symmetrical Pseudo Resistor, Sachin P Namboodiri*, Hongjie Zhu†, Lunal Khuon¥, Jan Van der Spiegel† and Robert Caverly, Northeastern Bioengineering Conference at Vestal, NY, April 5-7, 2016

133. "Somatosensory Encoding with Cuneate Nucleus Microstimulation: Detection of Artificial Stimuli," Srihari Y. Sritharan, Andrew G. Richardson, Pauline K. Weigand, Ivette Planell-Mendez, Xilin Liu, Hongjie Zhu, Milin Zhang, Jan Van der Spiegel, and Timothy H. Lucas,

accepted, 38th Annual Conference of the IEEE Engineering and Biology Society EMBS, Orlando, Fl, August 2016.

134*. "System-on-a-Chip Brain-Machine-Interface Design - a Review and Perspective," Jan Van der Spiegel, Milin Zhang and Xilin Liu, 13th International Conference on Solid State and Integrated Circuit Technology (ICSICT 2016), Oct. 25-28, 2016 in Hangzhou, China.

135. "A Fully Integrated Wireless Sensor-Brain Interface System to Restore Finger Sensation," IEEE International Symposium on Circuits and Systems (ISCAS) *(Received the Beset Student Paper Award; 2nd Place*), p 650-3, 2014; Baltimore, MD, June 2017; Xilin Liu, Milin Zhang, Hongjie Zhu, Andrew Richardson, Tim Lucas, Shu Yang, Jan Van der Spiegel.

136. "A Fully Integrated Wireless Sensor-Brain Interface System to Restore Finger Sensation", Proc. of the 2017 IEEE International Symposium on Circuits & Systems (ISCAS2017), Baltimore, MD, USA from May 28-31 (Selected as the Best Paper, 2nd place); Xilin Liu, Milin Zhang, Hongjie Zhu, Xiaotie Wu, Andrew Richardson, Sri Sritharan, Dengteng Ge, Shu Yang, Tim Lucas, Jan Van der Spiegel.

137. "A Wireless Neuroprosthetic for Augmenting Perception Through Modulated Electrical Stimulation of Somatosensory Cortex," Proc. of the 2017 IEEE International Symposium on Circuits & Systems (ISCAS2017), Baltimore, MD, USA from May 28-31;

138.* Van der Spiegel, J., Zhang, M., & Liu, X. (2017, October). The next-generation brain machine interface system for neuroscience research and neuroprosthetics development. In ASIC (ASICON), 2017 IEEE 12th International Conference Application Specific Integrated Circuits (pp. 436-439).

139. "Wireless Sensor Brain Machine Interfaces for Closed-loop Neuroscience Studies," Xilin Liu, Milin Zhang and Jan Van der Spiegel, Proc. IEEE International Conference on ASIC (ASICON 2019), Chongqing, China, Oct. 20-Nov. 1, 2019

140. "Hybrid-Integrated Artificial Mechanoreceptor in 180 nm CMOS," Han Hao, Lin Du, Andrew Richardson, Timothy Lucas, Mark Allen, Jan Van der Spiegel, Firooz Aflatouni, IEEE RFIC Symposium, Los Angeles, June 22, 2020, Nominated for the Best Student Paper.

CONFERENCE PRESENTATIONS (without proceedings)
Invited Presentations:

1. "Integrated Sensor Arrays," *Material Research Soc. Meeting,* Palo Alto, CA, April 15-18, 1986.

2. "The Role of Rapid Thermal Annealing of Silicides in VLSI," *Plenary talk at the First Congress of the Brazilian Microelectronics Soc.*, Compinas, Brazil, July 15-17, 1986.

3. "Integrated Electrochemical Sensors," *Symp. on Sensor Science and Technology*, Case Western Reserve Univ. and the Electrochem. Soc., Cleveland, OH, April 6-8, 1987.

4. "Integrated Sensors and Electronics: Where to Draw the Line?," Evening Panel

discussion, *IEEE Intl. Electron Dev. Meeting (IEDM),* Washington, DC, December 6-9, 1987.

5. "Rapid Thermal Annealing of Silicides for VLSI Applications," *Plenary talk at the IX Conf. on Solid-State Physics*, Mansoura, Egypt, April 12-14, 1988.

6. "A Foveated Retina-like Sensor based on CCD Technology," *Workshop on Analog VLSI and Neural Systems*, ISCAS 1989, Portland, OR, June 8, 1989.

7. "Artificial Neural Networks: Principles and VLSI Implementation," Plenary Talk at the *Vth Brazilian Microelectronics Congress*, Campinas, Brazil, July 11-13, 1990.

8. "Undergraduate Fellowships as a Gateway to Graduate Research - Penn's Experience with SUNFEST (Summer Undergraduate Fellowships in Sensor Technologies)", *National Science Foundation Workshop on Research Experience for Undergraduates in Engineering,* Orlando, FL Nov. 10-12, 1991.

9. "Computational Sensors of the 21st Century," Keynote Talk at the Intl. Symp. on Sensors in the 21st Century, Oct. 29, 1992, Tokyo, Japan.

10. "Smart Sensors and Biologically Inspired Algorithms", 15th Sensor Symposium, Kawasaki, Japan, June 3-4, 1997.

11. "Speech Processing using the Average Localized Synchrony Detection", 139th Meeting of the Acoustical Society of America, Atlanta, May 30- June 3, 2000, A. M. Abdelatty Ali, J. Van der Spiegel and Paul Mueller; Journal of the Acoustical Society of America, May 2000, Vol. 107, Issue 5, p. 2908

12. "Biologically Inspired Vision Sensors", Keynote Address at the 23rd Int. Conf. On Microelectronics, Nis, Yugoslavia, May 12-15, 2002.

13. " Biologically Inspired Vision Sensor for the Detection of Higher-Level Image Features:, Plenary talk at the IEEE Conference on Electron Devices and Solid-State Circuits, Hong Kong, December 16-18, 2003.

14. "Biologically Inspired Vision Sensors – Strategies of the Biological Sensory System, and CMOS Implementations", Keynote at the IBEROSENSORS 2006 Conf, Montevideo, Sept, 27-29, 2006.

15. "Low Cutoff Frequency Integrated Neural Amplifiers Using Symmetrical Pseudo Resistors," Sachin P Namboodiri, Hongjie Zhu, Lunal Khuon, Jan Van der Spiegel and Robert H. Caverly, 42nd Northeast Bioengineering Conference, April 5-7, 2016, Binghampton, NY.

16. *"Integrated Circuits: The Past, the Present and the Road Ahead – the best is still to come", Keynote Talk at the Advance CMOS Summer School 2017, Tsinghua University, Beijing, July 24 - August 4, 2017.

17. *"The Next-Generation Brain Machine Interface System For Neuroscience Research and Neuroprosthetics Development", 12th IEEE International Conference on ASIC (ASICON), Guiyang, China, October 25-28, 2017.
18. *"Brain-Machine Interface – The Next Frontier," China Technology Conference of Analog Devices, Hangzhou, China, Nov, 1, 2017.
19. *"A Bidirectional Closed-Loop Brain-Machine Interface – The Next Frontier," IEEE-ICEE Emerging Electronics Conf., Dec. 16-19, 2018, Bangalore, India.

Regular Presentations:

1. "Reduction of CCD Dark Current by TCE Oxidation," *Electrochem. Soc. Meeting*, Ext. Abst., pp. 299-301, Washington, DC, 1976.

2. "Electrical Activity of Oxidation Induced Stacking Faults in CCD's," *Electrochem. Soc. Meeting*, Ext. Abst., pp. 557-559, Pittsburgh, PA, 1978.

3. "Preparation and Characterization of Nickel and Molybdenum Silicides for Barrier Layers in High Temperature, Pressure Ion Sensitive Devices," *Fall Meeting of the American Physical Society*, November, 1982, Philadelphia, PA, Bulletin APS, Vol. 27, No. 8, p. 885, 1982.

4. "Extended Gate Chemically Sensitive Field Effect Transistor," *2nd Intl. Conf. on Solid-State Sensors and Actuators*, Abstract, p. 71, Delft, May 31 - June 3, 1983.

5. "Multiple Chemically Sensitive Field Effect Devices," *2nd Intl. Conf. on Solid-State Sensors and Actuators*, Abstract, p. 70, Delft, May 31 - June 3, 1983.

6. "Material Processing by Rapid Thermal Annealing," *Meeting of the American Physical Society*, March 1984, Detroit, IL, Bulletin APS, vol. 29, no. 3, p. 403, 1984.

7. "Incoherent Radiative Processing of Ti Silicides," *Intl. Conf. on Metallurgical Coatings*, San Diego, CA, April 1984.

8. "Examination of the Fabrication of the ICD by Temperature Gradient Zone Melting," *Jap. Appl. Physics Society Meeting*, March 29 - April 1, Abstract 1p. I-7, p. 680, 1984.

9. "Characterization of Palladium Silicides Formed by Fast Radiative Processing," *Fall Meeting of the MRS Society,* Boston, MA, November 26-30, 1984.

10. "Electrical Characteristics of Fast Radiatively Processed Titanium Silicide Thin Films on Silicon," *Intl. Conf. on Metallurgical Coatings*, Los Angeles, CA, April 1985.

11. "Titanium Silicide Formation by Rapid Thermal Annealing," M. Tanielian, S. Blackstone and J. Van der Spiegel, 1*5th European Solid-State Dev. Res. Conf. ESSDERC* Abst. 9H, 303, Aachen, September 9-12, 1985.

12. "Computerized Data Acquisition of Plaque pH and pCa," Abst. 946, *Annual Meeting of Amer. Assoc. Dental Res.*, Washington, DC, March 12-15, 1986.

13. "Computerized Data Analysis of Plaque pH and pCa," Abst. 512, *Intl. Assoc. for Dental Res*., The Hague, The Netherlands, June 26-28, 1986.

14. "Titanium Based Ternary Silicides and Solid Solutions," *Workshop Proc. on Refractory Metals and Silicides, Aussios,* France, March 24-26, 1987.

15. "Intelligent Sensors and Expert Systems," *Symp. for Innovation in Measurement Science*, Geneva, NY, August 2-7, 1987.

16. "PS/2 Based VLSI Design Environment," *Academic Information Systems Conf.* (ACIS), Tempe, AZ, September 25-28, 1988.

17. "Design and Fabrication of Si P(VDF-TrFE) Piezo-Electric Acoustic Sensor," *Intl. Conf. Metallurgical Coatings*, San Diego, CA, April 17-21, 1989.

18. "Silicides and Ternary Systems: An Adventure in Material Science," *Nato Advanced Study Institute on Novel Silicon Based Tech.*, Boca Raton, FL, July 17-28, 1989.

19. "A CCD Camera with Non-Uniform Sampling Structure", *SPIE Symp. on Advances in Intelligent Robotics Systems and Computer Vision*, Philadelphia, PA, November 6-9, 1989.

20. "Analysis of TiW Alloy as a Contact Barrier Between Al and $TiSi_2$," *Proc. of the Electrochem. Soc.*, Montreal, Quebec, Abstract l57, p. 233, 1990.

21. "A Space-Variant Retina-Like CCD Image Sensor," *25th Annual Conf. on Information Sciences and Systems*, J. Hopkins Univ., Baltimore, MD, March 22, 1991.

22. "Solving Neural Network Problems With A Prototype General Purpose Analog Neural Computer," *Neural Network for Computing Conf.,* Snowbird, UT, April 2-5, 1991.

23. "Real-Time Decomposition of Acoustical Patterns with an Analog Neural Computer," *SPIE on Applications of Artificial Neural Networks III*, Orlando, FL, Vol. No. 1709, pp. 758-769, April 1992.

24. "Orientation Sensor using a Decoding Scheme and a Winner-take-all Circuit", *Proc. Intl. Conf. Sensors and Actuators* (Transducers'95), pp. 163-166, Stockholm, Sweden, July 26-29, 1995.

25. "SUNFEST – Summer Undergraduate Fellowship in Sensor Technology," NSF Engineering and Computing Grantee Meeting, February 16-18, 2005, Washington, DC.

26. “SUNFEST – an REU Program in Sensor Technology”, Jan Van der Spiegel, Jorge Santiago and Enakshi Bose, Engineering Education NSF Awardees Conference, September 26-28, 2007, Arlington, Virginia. [poster presentation]
27. “HIGH-RESOLUTION INTEGRATED IMAGE SENSOR WITH POLYMER MICROPOLARIZED ARRAYS,” V. GRUEV, A. ORTU, Z. YANG, J. VAN DER SPIEGEL, AND N. ENGHETA, FRONTIERS IN OPTICS 2007 THE 91ST ANNUAL MEETING OF THE OPTICAL SOCIETY OF AMERICA, SAN JOSE, CA, SEPTEMBER 16-20, 2007, ABSTRACT FTUS6. (PRESENTED BY V. GRUEV)
28. “SUNFEST – an REU Program in Sensor Technology”, Jan Van der Spiegel and Valerie Lundy-Wagner, Engineering Education NSF Awards Conference, , Reston, VA, Nov. 2009.
29. SUNFEST: A dynamic REU Program in Sensor Technology, J. Van der Spiegel, V. Lundy-Wagner, Engineering Education NSF Awards Conference, Reston, VA, March 13-15, 2011
20. "eSkin: Energy Minimization via Multi-Scalar Architectures," the "101_2 Energy Circuits + Artificial Ecologies" topic during the Research + Design Project Session at the ACSA Annual Meeting, March 21-24, 2013, San Francisco, CA (Jenny Sabin, Andrew Luca, S. Yang, J. Van der Spiegel, N. Engheta.

16. *Design of a Foldable Architecture Integrated Smart Tiles (Poster Presentation)*
Hongjie Zhu, Milin Zhang, Nader Engheta & Jan Van der Spiegel, Dengteng Ge, Luciano Drummond, Jerry Chee, Serena Jiang & Shu Yang, Martin Miller, Giffen Ott, Andrew Lucia & Jenny Sabin; *EFRIFEST: Workshop on Foldable, Buildable, & Responsive Materials from the micro scale to the building scale* at Penn on 22-23 August 2014

17. Design of a eSkin Prototype Using Responsive Materials (Poster Presentation); DeShaye, Emily Liu, Brianna Harvey; *EFRIFEST: Workshop on Foldable, Buildable, & Responsive Materials from the micro scale to the building scale* at Penn on 22-23 August 2014

INVITED SEMINARS

1. "Characterization of Dark Current-Non-Uniformities in Charge-Coupled Devices," Bell Northern Research, Ottawa, Canada, September 1978.

2. "Thermal Generation of Electron-Hole Pairs in Charge-Coupled Devices," Kodak, Rochester, NY, September 1978.

3. "Charge-Coupled Devices as Image Sensors," Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, PA, February 1981.

4. "Fast Radiative Processing of Silicides," Hitachi Research Laboratory, Hitachi, May 24, 1984.

5. "Fast Radiative Processing of Titanium Silicide," University of Tokyo, Department of Electrical Engineering, Tokyo, May 25, 1984.

6. "Trends in VLSI Technology and the Need of Silicides," Saitama University, Dept. of Electrical Engineering, Saitama, May 26, 1984.

7. "Fast Radiative Processing of Titanium Silicides," Nippon Electric Co., Central Research Labs, Kawasaki, May 28, 1984.

8. "The Need of Fast Incoherent Processing in VLSI Fabrication," Shizuoka University, Hamamatsu, May 29, 1984.

9. "Silicide Formation by Rapid Thermal Processing," IBM, Thomas Watson Research Center, Yorktown Heights, NY, April 10, 1985.

10. "The Impact of Rapid Thermal Annealing of Silicides on VLSI," Institute of Physics, Fed. Univ. Rio Grande do Sul, Porto Alegre, Brazil, July 7, 1986.

11. "Formation and Characterization of Refractory and Near-Noble Metal Silicides Formed by Rapid Thermal Annealing," Institute of Physics, Fed. Univ. Rio Grande do Sul, Porto Alegre, Brazil, July 8, 1986.

12. "Rapid Thermal Annealing of Silicides for VLSI," Microelectronics Lab., Univ. of Sao Paulo, Sao Paulo, Brazil, July 10, 1986.

13. "Characterization of Refractory and Near-Noble Silicides Formed by Rapid Thermal Annealing," Lab. Integrated Systems, Univ. of Sao Paulo, Sao Paulo, Brazil, July 11, 1986.

14. "Microsensors: Integrated Electrochemical Sensor Probe and Piezoresistive Tactile Sensor Arrays," Dept. of Electrical Engr., Drexel University, Philadelphia, PA, November 3, 1986.

15. "Microfabricated Chemical Sensors for Biomedical Applications," Scuola Superiore S. Anna, Italy, March 6, 1989.

16. "LSI-Design, Artificial Retinas and Neural Networks," Linköping Institute of Technology, Dept. of Physics and Measurement Technology, Linköping, Sweden, June 22, 1989.

17."VLSI Implementation of Neural Systems," Physics Dept., University of Pennsyl-vania, September 20, 1989.

18. "Integrated Circuits-Foundations of a Brave New World," School of Engineering & Applied Science, University of Pennsylvania, October 20, 1989.

19. "Intelligent Sensors," Siemens Corporate Research Center, Princeton, NJ, May 25, 1990.

20. "A General Purpose Hybrid Neural Computer," Distinguished Lecture Series, IEEE NJ Coast Section, Joint Chapter Circuits and Systems/Signal Processing Society, Holmdel, NJ, June 14, 1990.

21. "Integrated Solid-State Sensors," Univ. of Campinas, Brazil, July 10, 1990.

22. "Foveated Retina-Like CCD Sensor with Non-Uniform Tiling Grid," Princeton University, February 5, 1991.

23. "A Multi-Chip Neural Network for Dynamic Computation," Univ. of Genova, Genova, Italy, April 29, 1991.

24. "VLSI Implementation of a Multi-Chip Analog Neural Network for Dynamic Computations," Drexel University, Philadelphia, PA, June 3, 1991.

25. "Computers that Mimic the Brain - Myth or Reality," Tau Beta Pi seminar, University of Pennsylvania, April 1992.

26. "Computational and Log Polar Image Sensors," DARPA Workshop on Computational Sensors, University of Pennsylvania, May 11-12, 1992.

27. "Computational Sensors of the 21st Century," Kawasaki Steel Corp., Chiba, Japan, October 27, 1992.

28. "Computational Sensors of the 21st Century," University of Tokyo, Dept. of Eng. Math. and Information, Tokyo, Japan, Oct. 28, 1992.

29. "Neural Networks: Machines that Mimic the Brain," Spirit of Discovery Lecture, School of Engineering and Applied Sciences, University of Pennsylvania, March 23, 1993.

30. "An Analog Neural Network for Real-Time Decomposition of Acoustical Patterns," Research Institute of Electronics, Shizuoka University, Hamamatsu, Japan, June 11, 1993.

31. "Compuational Sensors," Dept. of Computer and Information Science, Saitama University, Japan, June 14, 1993.

32. "An Analog Neural Computer for Real-Time Dynamic Applications," Dept. of Computer and Information Science, Saitama University, Japan, June 14, 1993.

33. "An Analog Neural Network for Real-Time Decomposition of Acoustical Patterns," NEC Corporation, Microelectronics. Research Lab, Sagamihara, Japan, June 15, 1993.

34. "Large Scale Analog Neural Computer for Spatio-Temporal Pattern Analysis," Toshiba Research Center, Kawasaki, Japan, July 26, 1994.

35. "Concepts and Principles of Neural Networks" Saitama University, Urawa-shi, Japan, July 29, 1994,

36. "A Programmable Analog Neural Computer with Applications to Speech Recognition," Integrated Sytems Lab, Texas Instruments, Dallas, TX, July 24, 1995.

37. "Goals and Uses of Educational MOSIS - Eniac-on-a-Chip," NSF workshop on integration of education and research, Arlington, VA, March 29, 1996.

38. "Smart Sensors and Biologically Inspired Algorithms", Linkoping University, Sweden, May 16, 1997.

39. "From Vacuum Tubes to Microchip", Department of Electrical Engineering, Villanova University, Villanova, PA, April 17, 1998

40. "Eniac-on-a-Chip", Philomethean Society, University of Pennsylvania, April 23, 1998.

41. "Biologically Inspired Optical Sensors," Philips Research Lab, Eindhoven, The Netherlands, May 5, 1998.

42. "Teaching Digital Design with FPGA's", Xilinx University Workshop, University of Pennsylvania, June 24-25, 1998.

43. "Biologically Inspired Vision Sensors", Dept. of Electrical Engineering, Tsinghua University, Beijing, June 14, 1999 - IEEE SSCS Distinguished Lecture.

44. "Biologically Inspired Sensors", Chinese Academy of Sciences, State Key Laboratory of Transducer Technology, Shanghai, P.R. China, June 22, 1999.

45. "The ENIAC: From Vacuum Tubes to Microchip - History and Operation of the ENIAC", IEEE SSCS Distinguished Lecture, Electron Devices/Solid-State Circuits Chapter, Baltimore, Historical Electronics Museum, Linthicum, MD, March 15,2000.

46. "Biologically Inspired Vision Sensors," IGERT Center for Integrated Sensing Systems and ASSDeC, University of Kentucky, Lexington, July 13, 2000.

47. "Biologically Inspired Vision Sensors," IC Design Education Center (EDIC), School of Engineering and Computer Science, Hanyang University, July 18, 2000.

48. "CMOS Vision Sensors," Distinguished Lecture, IEEE SSCS Seoul Chapter, Research Institute of ASIC Design, Yonsei University, Seoul, July 19, 2000.

49. "Biologically Inspired Vision Sensors," Inter-University Semiconductor Research Center, Seoul National University, Seoul, July 20, 2000.

50. "Biologically Inspired Vision Sensors," SSCS Distinguished Lecture, Texas Instruments, Dallas, Feb. 19, 2001.

51. "Biologically Inspired Vision Sensors, "University of Patras, Greece, June 2001.

52. "ENIAC - From Vacuum Tubes to Microchip: History, Operation and Reconstruction in VLSI," Distinguished Lecture sponsored by the IEEE Solid-State Circuits and the Computer Chapters, University of Toronto, October 24, 2003.

53. "Biologically Inspired Vision Sensors," Dept. of Electrical Engineering, Columbia University, New York, April 26, 2005.

54. "Biologically Inspired Smart CMOS Vision Sensors," IEEE SSCS Distinguished Lecture, Denver Chapter, Fort Collins, July 17, 2005.

55. "Biologically Inspired Smart CMOS Vision Sensors," University of Sao Paulo, Brazil, Sept. 25, 2006.

56. "Biologically Inspired Optical Vision Sensors: strategies of biological systems, visual sensory system, neuromorphic sensing and CMOS implementations including pre- and post-processing", Plenary talk at IBERSENSOR06, Montevideo, Uruguay, Sept. 27, 2007.

57. "Biologically Inspired Smart CMOS Vision Sensor", IEEE SSCS and Microsystems Strategic Alliance of Quebec (ReSMIQ), McGill University, November 3, 2006.

58. "How to write a good ISSCC paper", Asia Solid-State Circuits Conference (A-SSCS), Hangzhou, China, Nov. 14, 2006.

59. "How to Give a good ISSCC paper", Asia Solid-State Circuits Conference (A-SSCS), Jesu, S. Korea Nov, 2007.

60. "How to write and give a good ISSCC paper," Asia Solid-State Circuits Conference (A-SSCS), Taipei, Nov, 2009.

61. "Bio-inspired Polarization Imaging – making the invisible visible," National University of Singapore, Nov. 23, 2010

62. "Bio-inspired Polarization Imaging – making the invisible visible," Inst. Microelectronics (IME), Singapore, Nov. 23, 2010

63. "Bio-inspired Polarization Imaging – making the invisible visible," IEEE Solid-State Circuits Soc. Chapter, Penang, Malaysia, Nov. 26, 2010

64. "Bio-inspired Polarization Imaging – making the invisible visible," SSEI IGERT Summer Institute, University of Maine, Orono, ME, June 11, 2010.

65. "Bio-inspired Vision Sensors," NSF/EFRI workshop on Energy Minimization via Multi-Scaler Architectures, Univ. of Pennsylvania, Oct. 8, 2010.
66. "Sunfest", NSF Conference

67. Developing a Global Research Network as an Integral Part of a Successful Research Career," Young Researchers Transatlantic Academy, June 3-7, 2012, Techn. University of Aachen, Germany, J. Van der Spiegel
68. "Smart Polarization Image Sensors: Learning from Biology to Make the Invisible Visible," Jan Van der Spiegel, Xiaotie Wu, Milin Zhang, Nader Engheta, Plenary Talk at the 2012 IEEE Conference on Electron Devices and Solid-State Circuit (EDSSC), Bangkok, Thailand, Dec, 3, 2012.
69. "Smart Polarization Image Sensors: Learning from Biology to Make the Invisible Visible," Jan Van der Spiegel, Vietnam National University, Ho Chi Minh City, Vietnam, November 24, 2012.
70. "Bio-inspired vision sensors and processing systems," WIT2014 Workshop on Intelligent Trackers, Physics Dept, University of Pennsylvania, May 14, 2014.
71. "Biologically Inspired Image Sensors and Processing Systems," School of Microelectronics and Solid-State Electronics, University of Electronic Science and Technology of China, Chengdu, July 7, 2014.
72. "How to write a good JSSC and ISSCC Paper," School of Microelectronics and Solid-State Electronics, University of Electronic Science and Technology of China, Chengdu, July 7, 2014.
72. "Biologically Inspired Image Sensors and Processing," State Key Lab of Analog and Mixed-Signal VLSI, University of Macau, 2014 SSCS Distinguished Lecture, July 9, 2014.
74. "How to write a good JSSC and ISSCC Paper," State Key Lab of Analog and Mixed-Signal VLSI, University of Macau, July 9, 2014.
75. "Bio-Inspired Polarization Imagers – making the invisible visible, " A SSCS DL Lecture, University of Texas, Austin, October 21, 2014.
76. "Bio-Inspired Polarization Imagers – making the invisible visible," Dept. of EE, University of Southern California, Los Angeles, April 3, 2015.
77. "Bio-Inspired Polarization Imagers – making the invisible visible," A SSCS DL Lecture, Dept. of ECE, University of British Columbia, Vancouver, Canada, May 11, 2015.
76. "Bio-Inspired Polarization Imagers – making the invisible visible," A SSCS DL Lecture, SSCS Solid State Circuit Chapter, University of Calgary, Canada, May 12, 2015.
77. "Bio-Inspired Polarization Imagers – making the invisible visible," A SSCS DL Lecture, SSCS Solid State Circuit Chapter, St. Cyril and Methodius University, Skopje, Republic of Macedonia, September 23, 2015.
78. "Bio-Inspired Polarization Imagers – making the invisible visible," Plenary at the 12th Int. ETAI Conference, Republic of Macedonia, Ohrid, September 24, 2015.
79. "Bio-Inspired Polarization Imagers – making the invisible visible," A SSCS DL Lecture, SSCS Solid State Circuit Chapter, LeHigh University, December 2, 2016

80. “Bio-Inspired Polarization Imagers – making the invisible visible,” A SSCS DL Lecture, SSCS Solid State Circuit Chapter, Princeton University, December 3, 2016
81. “Bio-Inspired Polarization Imagers – making the invisible visible,” A SSCS DL Lecture, SSCS Solid State Circuit Chapter, University of Columbia, December 4, 2016
82. “Integrated Circuits: The Past, The Present and the Road Ahead – the best still has to come,” Plenary talk at the Summer School on Advanced CMOS Technology and Circuits, Tsinghua University, China, August 30, 2017.
83. “CMOS Integrated Circuits: The Past, The Present and the Future,” Analog Devices (ADI), Beijing, China, September 27, 2017.
84. “How technology can learn from biology and how biology can benefit from technology,” Donghua University, Shanghai, November 3, 2017.
85. “From Bio-inspired Imagers to Brain-Machine Interfaces: Synergy between Engineering and Biology,” Xi’an Jiao Tong University, Xi’an, January 8, 2018.
86, “From Bio-inspired Imagers to Brain-Machine Interfaces: Synergy between Engineering and Biology,” University of Science and Technology (USTC), Hefei, January 15, 2018.
87. “Brain-Machine Interface – The Next Frontier,” IEEE SSCS Distinguished Lecture, Oregon State University, Corvallis, OR, November 15, 2018.
88. * “A Bidirectional Closed-Loop Brain-Machine Interface – The Next Frontier,” Technology Forum: Breakthrough Technologies for A new Tomorrow, Dec. 13, 2018, Indian Institute of Science, Bangalore, India.