

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

(215) 898-7116
jan@seas.upenn.edu

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

PLACE AND DATE OF BIRTH: Aalst, Belgium, April 12, 1951

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:

- 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-present)
- 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:

- 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:

- 7/95 - present *Professor*
Director of Microfabrication Facilities; Director of Center for Sensor Technologies (7/89 - Present)
University of Pennsylvania
Department of Electrical Engineering, Center for Sensor Technologies.
Research: Integrated vision sensors, microfabrication technology; and electronic materials; fast analog IC's; 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.
- Analog to Digital Converters
- Advanced microfabrication technologies

PROFESSIONAL AND SOCIETY MEMBERSHIPS:

- Institute of Electrical and Electronic Engineers (IEEE) - Fellow

TEACHING EXPERIENCE:

University of Pennsylvania:

ESE200: Principles of Digital Logic
ESE201: 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
EE319: Fundamentals of Solid-State Circuits
EE442: Senior Design Project (supervised 43 projects)
EE471: Digital Integrated Circuits (new course, introduced 1983)
EE522: Fundamentals of Sensor Technologies - I (new course, introduced 1991)
EE560: Digital Integrated Circuits and VLSI - Fundamentals (new course, introduced 1983)
EE562 & EE419: Analog Integrated Circuits
EE899: Graduate Independent Study (17)
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 190 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 Avancées in Paris, France
3. Study of the Formation and Characteristics of Al/TiW/TiSi₂ 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). Associate 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 Hill, 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 assistant professor at Tufts University, Dept. Electrical Engineering.
16. Mixed-Signal Design for a Silicon Cort-X, A Pathway to an Artificial Brain, Yie Yang, (August 2006), Assistant 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, starting Sept. 2002
19. Chengjie Zuo, AlN Resonators and Oscillators, co-supervision with Prof. Gianluca Piazza.

- MSE: - Shielded Piezoresistive 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 Co⁶⁰ Irradiation on 1.6 μ m 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 (May 2007)

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:

Former Graduate Students who are Faculty at other Universities:

- Ralph Etienne-Cummings, Associate Professor at J. Hopkins University, Dept. of Electrical Eng.
- Sameer Sonkusale, Assistant Professor of Electrical Engineering at Tufts University

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-present

ADMINISTRATIVE RESPONSIBILITIES:

University Committees:

Present:

Study Abroad Advisory Committee for Northern and Central/Eastern Europe (2002-present)
 Penn-Leuven Exchange Committee (Chair) (1983-present)
 Advisor of University Scholars (1984-present)

Past:

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 WXPB-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

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 Renovation Committee (2005-present)
PhD Qualifying Exam Committee (2004-2005)
PhD Admission Committee (2004-2005)
ESE ABET Committee (2003-present)

Past: 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:

Technical Program Chair of the International Solid-State Circuits Conference (ISSCC2007).
Elected Member of the IEEE Solid-State Circuits Society (SSCS), Jan. 2004-2007 and Jan. 2007-2010..
Chapter Chair, Solid-State Circuits Society, IEEE
Member awards committee (IEEE Fellows selection) of the IEEE SSCC.
Member, Executive Committee of the IEEE International Solid-State Circuit Conference, 1982 - present.
Distinguished Lecturer, IEEE Solid-State Circuits Society (1999-present).

Past:

- 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 Catheter-Based Imaging Tech. Conf., O-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 1st Microelectronic Congress of the Brazilian Microelectronics Society, Campinas, 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).
4. Method of Manufacturing Ferroelectric MOSFET Sensors, U.S. Patent No. 5,254,504 (October 19, 1993).
5. "True Background Calibration Technique for Pipelined Analog-Digital Converters", S. Sonkusale, J. Van der Spiegel and K. Nagaraj; U.S. Patent Number 6,606,042 (August 2003)

Patent Applications:

"Sensor and Polarimetric Filters for Real Time Extraction of Polarimetric Information at the Focal Plane, and Method of Making Same," V. Gruev, Jan Van der Spiegel and Nader Engheta, UPN-4806/S4194, filed April 18, 2006.

"Two Transistor per Pixel Linear Current Mode CMOS Imager," Viktor Gruev, Jan Van der Spiegel and Zheng Yang; disclosure April, 14, 2006; S4195

"One and Half Transistor (1.5T) Current Mode Imager," Viktor Gruev, Jan Van der Spiegel and Zheng Yang; disclosure April, 14, 2006; S4192.

PUBLICATIONS IN REFEREED JOURNALS/TRANSACTIONS (*invited paper):

1. "Experimental Results on Three-phase Polysilicon CCD's with a TCE SiO₂ - Si₃N₄ Gate Insulator," *IEEE J. Solid State Circuits*, pp. 297-299, February, 1976. G. Declerck, K. DeMeyer, E. Janssens, E. Laes and J. Van der Spiegel.
2. "Theoretical and Practical Investigation of Thermal Generation in Gate Controlled Diodes," *Solid-State Electronics*, Vol. 24, pp. 869-877, 1981. J. Van der Spiegel and G. Declerck.
3. "High Temperature and Pressure pH Sensors With Sputtered IrO Films," *Japanese Journal of Applied Physics*, Vol. 22, suppl. 22-1, pp. 469-472, 1982. T. Katsube, I.R. Lauks, J. Van der Spiegel and J.N. Zemel.
4. "The Extended Gate Chemically Sensitive Field Effect Transistor as Multi Specie Microprobe," *Sensor and Actuators*, Vol. 4:2, pp. 291-298, 1983. J. Van der Spiegel, I. Lauks, P. Chan and D. Babic.
5. "Characterization of Dark Current Non-Uniformities in Charge-Coupled Devices," *Solid State Electronics*, Vol. 24, pp. 147-154, 1984. J. Van der Spiegel and G. Declerck.
6. "Incoherent Radiative Processing of Titanium Silicides," *Thin Solid Films*, Vol. 118, pp. 155-162, 1984. J. Wei, J. Van der Spiegel and J. Santiago.

7. "Formation of Titanium Silicides by Fast Radiative Processing," *Appl. Physics Letters*, Vol. 45, pp. 527-528, 1984. C.S. Wei, J. Van der Spiegel, J. Santiago and L. Seiberling.
8. "Fast Radiative Processing of Platinum Silicides," *J. Appl. Physics*, Vol. 57, pp. 607-609, 1984. J. Van der Spiegel, C.S. Wei, J. Santiago and L. Seiberling.
9. "Fast Radiative Processing of Titanium Silicides Under Vacuum." *Materials Letters*, Vol. 2, pp. 477-482, 1984. J. Santiago, C.S. Wei and J. Van der Spiegel.
10. "Study of Different Sensors for High Resolution Linear CCD Imagers," *Sensors and Actuators*, Vol. 6, pp. 51-64, 1984. J. Van der Spiegel, J. Sevenhans, A. Theuwissen, J. Bosiers, I. Debusschere and G. Declerck.
11. "Use of Gold Films as Mask for KOH Preferential Etch," *Thin Solid Films*, Vol. 120, pp. L79-81, 1984. M. Ogita, T. Carroll, J. Wei, J. Van der Spiegel and J. N. Zemel.
12. "Electrical Characteristics of Fast Radiatively Processed Titanium Silicides Thin Film," *J. Vac. Sci. and Tech.*, Vol. A3, pp. 2259-2263, 1985. C.S. Wei, J. Van der Spiegel and J.J. Santiago.
- 13*. "The Impact of Integrated and Intelligent Sensor Systems on Medical Equipment and Methods," *J. Medical Instrumentation*, Vol. 19, pp. 153-157, September 1985. J. Van der Spiegel.
14. "Characterization of Palladium Silicides Formed by Rapid Thermal Annealing," *J. Appl. Physics*, Vol. 58, pp. 4200-4206, 1985. C.S. Wei, J. Van der Spiegel and J. Santiago.
15. "The Influence on Interposed Titanium Thin Film on the Formation of Tungsten Silicides," *J. Appl. Phys.*, Vol. 61, pp. 1429-1434, 1987. C.S. Wei, M. Setton, J. Van der Spiegel and J. Santiago.
16. "Growth Kinetics of Palladium Silicides Formed by Rapid Thermal Annealing," *J. Electrochemical Soc.*, Vol. 135, pp. 446-451, 1988. C.S. Wei, J. Van der Spiegel and J. Santiago.
17. "Silicide Formation From Ternary Metal-Metal-Silicon Systems", *Thin Solid Films*, Vol. 156, pp. 351-363, 1988. M. Setton and J. Van der Spiegel.
18. "Formation of a Ternary Silicide for Ni/Ti/Si(100) and Ni/TiSi₂ Structures," *J. Mat. Res.*, Vol. 4, pp. 1218-1226, 1989. M. Setton, J. Van der Spiegel and B. Rothman.

19. "Titanium/Nickel Bilayers on Silicon: Sputter-Induced Intermixing, Rapid Thermal Annealing and Ternary Silicide Formation," *Thin Solid Films.*, Vol. 177, pp. 263-277, 1989. E. Horache, J. Van der Spiegel and J. Fischer.
20. "Formation of Epitaxial Yttrium and Erbium Silicide on (111) Silicon in Ultrahigh Vacuum," in *Applied Surface Science*, Vol. 38, pp. 162-170, 1989. M. Siegal, F. Kaatz, W. Graham, J.J. Santiago and J. Van der Spiegel.
21. "Silicide Formation for Co-Ti-Si Structures Processed by RTP Under Vacuum," *Applied Surface Science*, Vol. 38, pp. 62-71, 1989. M. Setton and J. Van der Spiegel.
22. "Formation of Epitaxial Yttrium Silicide/Silicon(111) in Ultrahigh Vacuum," in *J. Applied Physics*, Vol. 66, pp. 2999-3006, 1989. M. Siegal, F. Kaatz, W. Graham, J.J. Santiago and J. Van der Spiegel.
23. "High Speed Bipolar Integrated Circuits for SSC Applications," *Nuclear Instruments & Methods in Physics Research*, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, Vol. 283, No. 3, pp. 806-809, November 1989. F.M. Newcomber, R. Van Berg, J. Van der Spiegel and H.H. Williams.
24. "Front-End and Signal Processing Electronics for Detectors at High Luminosity Colliders," *IEEE Trans. Nuclear Science*, Vol. 36, pp. 446-457, 1989, L. Callewaert, W. Eyckmans, W. Sansen, V. Budihartono, F. Newcomer, R. Van Berg, J. Van der Spiegel, S. Tedja, H. Williams and A. Stevens.
25. "A Fast Low-Power Time-to-Voltage Connector for High Luminosity Collider Detector," *IEEE Trans. Nuclear Science*, Vol. 36, pp. 517-521, 1989. A. Stevens, V. Budihartono, R. Van Berg, J. Van der Spiegel, H. Williams, L. Callewaert, W. Eyckmans and W. Sansen.
26. "A Time-to-Voltage Convertor and Analog Memory for Colliding Beam Detectors," *IEEE J. Solid-State Circuits*, Vol. 24, pp. 1748-1752, 1989. A. Stevens, R. Van Berg, J. Van der Spiegel and H. Williams.
27. "Design and Fabrication of a Silicon P(VDF-TrFE) Piezoelectric Sensor," *Thin Solid Films*, Vol. 181, pp. 245-250, 1989. A. Lee, N. Fiorillo, J. Van der Spiegel, P. Bloomfield, J. Dao, P. Dario,.
28. "A Retinal CCD Sensor for Fast 2D Shape, Recognition and Tracking," *Sensors and Actuators*, Vol. A21, pp. 456-460, 1990. I. Debusschere, E. Bronckaers, C. Claeys, G. Kreider, J. Van der Spiegel, G. Sandini, P. Dario, F. Fantini, P. Bellutti, G. Soncini.

29. "A P(VDF-TrFE) Based Integrated Ultrasonic Transducer," *Sensors and Actuators*, Vol. A:22, pp. 719-725, 1990. A.S. Fiorillo, J. Van der Spiegel, P. Bloomfield, D. Esmail-Zandi.
30. "Epitaxial Growth of ErSi₂ on (111)Si," *Thin Solid Films*, Vol. 184, pp. 325-333, 1990. F. Kaatz, M. Siegal, W. Graham, J. Van der Spiegel and J. Santiago.
31. "Copper Silicide Formation by RTP and Induced Room Temperature Si Oxide Growth," *Applied Physics Letter*, Vol. 57, pp. 357-359, 1990. M. Setton, J. Van der Spiegel and B. Rothman.
32. "Fabrication and Structure of Epitaxial Terbium Silicide on Si(111)," *J. Applied Physics*, Vol. 69, pp. 514-516, 1991. F. Kaatz, J. Van der Spiegel and W. Graham.
33. "Review of Some Aspects of Ternary Metal-Metal-Si and Metal-B-Si Systems," *J. Appl. Phys.*, Vol. 69, pp. 994-999, 1991. M. Setton and J. Van der Spiegel.
34. "Niobium Disilicide Formation by Rapid Thermal Processing: Resistivity-Grain Growth Correlation and the Role of Native Oxide," *J. Appl. Physics*, Vol. 68, pp. 4652-4655, 1990. E. Horache, J. Fischer and J. Van der Spiegel.
35. "Study of the Thermal Stability of the Al/TiW/TiSi₂/Si Structure," *J. Electrochem. Soc.*, Vol. 138, pp. 2377-2381, 1991. R. Furlan, J. Van der Spiegel and J. Swart.
36. "Structural and Electrical Properties of ZrSi₂ and ZrCuSi₄ Formed by Rapid Thermal Processing," in *J. Appl. Phys.*, Vol. 70, pp. 193-197, 1991. M. Setton and J. Van der Spiegel.
37. "Anomalous Magnetotransport in Epitaxial TbSi_{2-x}," *J. Vac. Sci. Tech.* A9(3), pp. 426, 1991. F.H. Kaatz, J. Van der Spiegel, W.R. Graham and J.A. Chrobocek.
38. "Undergraduate Fellowship as a Gateway to Graduate Research," in *Engineering Education*, Vol. 8:3, pp. 381-383, April 1991. J. Van der Spiegel and J.N. Zemel, 1991.
39. "Full Integration of Extremely Large Time Constants in CMOS," *Electronics Letters*, Vol. 27:10, pp. 790-791, 1991. M. Steyaert, P. Kinget, W. Sansen and J. Van der Spiegel.
40. "Nb/Ni and Ni/Nb Bilayers on Si: Rapid Thermal Processing, Phase Separation, and Ternary Phase Formation," *J. Appl. Physics*, Vol. 69, pp. 7029-7033, 1991. E. Horache, J.E. Fischer and J. Van der Spiegel.
41. "An Analog Neural Network with Modular Architecture for Real-Time Dynamic Computations," in *IEEE J. Solid-State Circuits*, Vol. 27, pp.82-92, 1992. J. Van der

- Spiegel, D. Blackman, P. Chance, C. Donham, R. Etienne-Cummings and P. Kinget.
42. "Noise Measurement Results of a Radiation-Hardened CMOS 1.2 μ m P-well Process," in *Nuclear Instruments and Methods in Physics Research*, Vol. A312, pp. 576-584, 1992. S. Tedja, H.H. Williams, J. Van der Spiegel, F.M. Newcomer and R. Van Berg.
 43. "Noise Spectral Density Measurements of a Radiation-Hardened CMOS Process the Weak and Moderate Inversion," *IEEE Trans. Nuclear Science*, Vol. 39, pp. 804-808, August 1992. S. Tedja, H.H. Williams, J. Van der Spiegel, F.M. Newcomer and R. Van Berg.
 44. Study of Radiation Hard CMOS Process Under the Influence of Co⁶⁰ Irradiation," *IEEE Trans. Nuclear Science*, Vol. 39, April 1992. T-Y. Yau, H.H. Williams, J. Van der Spiegel and R. Van Berg.
 45. "Full Analog CMOS Integration of Very Large Time Constants for Synaptic Transfer in Neural Networks," *J. of Analog Integrated Circuits and Signal Processing*, Vol. 2, pp. 281-295, November 1992. P. Kinget, M. Steyaert and J. Van der Spiegel.
 46. "Modification of the Microstructure in Epitaxial ErSi_{2-x}," *Applied Physics Letters*, Vol. 62, pp. 1748-1750, April 12, 1993. F. Kaatz, W. Graham. and J. Van der Spiegel.
 47. "Modelling and Characterization of Noise in Short Channel CMOS Transistors," in preparation for *IEEE Electron Devices*, S. Tedja, J. Van der Spiegel, H.H. Williams and R. Van Berg.
 48. "Design and Performance of a Prototype General Purpose Analog Neural Computer," *Intl. J. Neural Computing*, Vol. 4, pp. 311-324, 1992. P. Mueller, J. Van der Spiegel, D. Blackman, P. Chance, C. Donham, R. Etienne-Cummings, J. Flinn, J. Kim, M. Massa and S. Samarasekera.
 49. "Multi Band Sigma Delta Modulation," *Electronics Letters*, No. 9, pp. 760-762, April 29, 1993. P.Aziz, H.Sorensen and J. Van der Spiegel.
 50. "A Fast, Low Power, Amplifier-Shaper-Discriminator for High Rate Straw Tracking Systems," *Trans. Nuclear Science*, Vol. 40, N4, P630-636, August, 1993. F.M. Newcomer, S. Tedja, R. Van Berg, J. Van der Spiegel and H.H. Williams.
 51. "An Accurate and Simple CMOS 'One-Over' Circuit," *Electronics Letters*, Vol. 29, No. 18, pp. 1618-1620, September 2, 1993. R. Etienne-Cummings, R. Hathaway and J. Van der Spiegel.

52. "A Silicon VLSI Optical Sensor for Pattern Recognition," *Sensors and Actuators A*, Vol. 43, No. 1-3, pp. 188-195, 1994. W.O. Camp and J. Van der Spiegel.
53. "A Compact Line and Edge Orientation Detection Sensor," *Sensors and Actuators A*, Vol. 40, No. 3, pp. 217-225, 1994. M. Nishimura and J. Van der Spiegel.
54. "A CMOS Time to Digital Converter IC with 2 Level Analog CAM," *IEEE J. Solid-State Circuits*, Vol. 29, pp. 1068-1076, 1994. E. Gerds, J. Van der Spiegel, R. Van Berg, H.H. Williams, L. Callewaert, W. Eyckmans and W. Sansen.
55. "Analytical and Experimental Studies of Thermal Noise in MOSFETs," *IEEE Trans. Electron Devices*, Vol. 41, No. 11, pp. 2069-2075, November 1994. S. Tedja, J. Van der Spiegel and H.H. Williams.
56. "A CMOS Low-Noise and Low-Power Charge Sampling Integrated Circuit for Capacitive Detector/Sensor Interfaces," *IEEE J. Solid-State Circuits*, Vol. 30, No. 2, pp.110-119, February 1995. S. Tedja, J. Van der Spiegel and H.H. Williams.
57. "Electronics for very High Rate Tracking Detectors," *Nuclear Instruments & Methods in Physics Research*, Vol. A360, pp. 146-149, 1995. H.H. Williams, N. Dressnandt, T. Ekenberg, E. J. Gerds, F.M. Newcomer, S. Tedja, R. Van Berg, and J. Van der Spiegel.
58. "Using a 1 Bit A/D to Obtain More Than 16 Bits of Resolution. An Overview of Sigma-Delta A/D Converters," P. Aziz, H. Sorensen, and J. Van der Spiegel, *IEEE Signal Processing Magazine*. (invited by editor), vol.13, No. 1, pp.61-85, January 1996.
59. "Neuromorphic Vision Sensors," in *Sensors and Actuators A*, Vol. SNA056, pp.19-29, 1996; R. Etienne-Cummings and J. Van der Spiegel.
59. "A Focal Plane Visual Motion Measurement Sensor, *IEEE Trans. Circuits and Systems*, Part I, Vol. 44, No. 1, Jan. 1997, pp.55-66, R. Etienne-Cummings, J. Van der Spiegel and P. Mueller.
60. "A Silicon VLSI Optical Sensor for Image Decomposition", in *Sensors and Actuators A*, vol.69/1, pp.53-61, 1998, M. Nishimura, K. Sunamura and J. Van der Spiegel
61. "Acoustic-phonetic features for the automatic recognition of stop consonants" in *The Journal of the Acoustical society of America*, pp 2777-2778, vol. 103 No.5 May 1998; A. M. Ali, J. Van der Spiegel and Paul Mueller.
62. "Feature-based Segmentation and Categorization of Continuous Speech," submitted to *IEEE Trans. Speech and Audio Processing*, 1999, A. M. Ali, J. Van der Spiegel and P. Mueller.

63. "Signal Adaptive Control Architecture of Delta-Sigma Modulator Design", Electronics Letters, Vol. 35, No. 8, p. 610, 1999, Q. Li, J. Van der Spiegel and K. Laker.
64. "Hardware Implementation of a Visual-Motion Pixel using Oriented Spatiotemporal Neural Filters," IEEE Transactions of Circuits and Systems II: Analog and Digital Signal Processing, Vol. 46, Sept. 1999, pp 1121-1136; R. Etienne-Cummings, J. Van der Spiegel and P. Mueller.
65. "Speech processing using the average localized synchrony detection", Journal of the Acoustical Society of America, pp. 2908, Vol. 107, 2000. A.M. Abdelatty Ali, Jan Van der Spiegel and Paul Mueller
66. "An optical feature detection sensor based on orientation decomposition", M. Nishimura and J. Van der Spiegel, Transactions of The Institute of Electrical Engineers of Japan (IEEJ), Vol.120-E, No.5, pp. 230-236, May, 2000.
67. "A CMOS optical sensor which counts the number of objects", M. Nishimura and J. Van der Spiegel, Transactions of The Institute of Electrical Engineers of Japan (IEEJ), Vol.120-E, No.5, pp. 225-229, May, 2000.
68. "A Foveated Silicon Retina for Two-Dimensional Tracking", IEEE Trans. Circuits and Systems II, Vol. 47, pp. 504-517, June 2000; R. Etienne-Cummings, J. Van der Spiegel, P. Mueller and M.Z. Zhang.
69. "True Background Calibration Technique for Pipelined ACD", Electronics Letters, Vol. 36, No. 9, pp786-788, 2000, S. Sonkusale, J. Van der Spiegel and K. Nagaraj.
70. "Acoustic-Phonetic Features for the Automatic Classification of Fricatives", Journal of the Acoustical Soc. of America (JASA), 109 (5), pp. 2217-2235, May 2001; A. M. Ali, J. Van der Spiegel and P. Mueller.
71. "Acoustic-Phonetic Features for the Automatic Classification of Stop Consonants", IEEE Trans. Speech and Audio Processing; Vol. 9, no. 8, pp 833-841, Nov. 2001; A. M. Ali, J. Van der Spiegel and P. Mueller.
73. "Robust Auditory-Based Speech Processing Using the Average Localized Synchrony Detection", IEEE Trans. on Speech and Audio Processing, Vol. 10, pp. 279-292, July 2002, A. M. Ali, J. Van der Spiegel and P. Mueller.
74. "Fully Integrated CMOS Phase Locked Loop with 30MHz to 2GHz Locking Range and +/-35ps Jitter", Journal of Analog Integrated Circuits and Signal Processing", July-August 2003, Volume 36, Issue 1-2. pp. 91-97; Chao Xu, Winslow Sargeant, K. Laker and J. Van der Spiegel.

75. "Using web-based technology in laboratory instruction to reduce costs," *Computer Applications In Engineering Education*, Vol. 10, No. 4, pp. 204-214, 2002; R. Powell, H. Anderson, J. Van der Spiegel and D. Pope.
76. "Generic Adaptive Self-Calibration Scheme for Pipelined Analog-to-Digital Converters," *IEEE Trans. Circuits and Systems II*, submitted for publications. S. Sonkusale, J. Van der Spiegel, K. Nagaraj.
77. "A CMOS Image Processing Sensor for the Detection of Image Features," *Journal Analog Integrated Circuits and Signal Processing*, Vol. 43, December 2005, pp. 1-17, 2005, M. Nishimura and J. Van der Spiegel.
78. "Non-Parallel Training for Voice Conversion Based on a Parameter Adaptation Approach," *IEEE Transactions on Audio, Speech, and Language Processing*, Vol. 14, No. 3, May 2006, pp. 952-963; A. Mouchtaris, J. Van der Spiegel and Paul Mueller.
79. "GBOPCAD: A Synthesis Tool for High-Performance Gain Boosted OPAMP Design," Jie Yuan, Nabil Farhat and Jan Van der Spiegel, *IEEE Trans. Circuits and Systems I*, Vol. 52, Issue 8, August 2005, pp 1535-1544.
80. "Background Calibration with Piecewise Linearized Error Model for CMOS Pipeline A/D Converter," accepted for publication in *IEEE Transactions Circuits and Systems I (TCAS-I)*, Jie Yuan, N. Farhat and J. Van der Spiegel, 2007.
81. "A Spectral Conversion Approach to Single Channel Speech Enhancement", *IEEE Transactions on Speech and Audio Processing*, Vol. 15, May 2007, pp. 1180-1193; A. Mouchtaris, J. Van der Spiegel, P. Mueller, and P. Tsakalides.
82. "Linear Current-Mode Active-Pixel Sensor," accepted for publication to the *IEEE J. Solid-State Circuits*. R. Philipp, R. Etienne-Cummings, V. Gruev, J. Van der Spiegel.
83. "Fabrication of a dual-tier thin film micropolarization array," *Optics Express*, Vol. 15, Iss. 8, pp. 4994-5007, April 2007. Viktor Gruev, Alessandro Ortu, Nathan Lazarus, Jan Van der Spiegel, and Nader Engheta.
84. "Cort-X II: The low-power element design for a dynamic neural network", accepted for publication in *IEEE TCAS-II*, J. Yuan, N. Farhat and J. Van der Spiegel, 2007.
85. "Cort-X: A Biologically-inspired corticonic system – theory and CMOS implementation *Analog Signal Processing*", submitted to *IEEE TCAS-II*, J. Yuan, N. Farhat and J. Van der Spiegel.
86. "ISSCC Paper Submissions- Increasing the Likelihood of Success," *IEEE SSCS Newsletter*, July 8, 2007; Jan Van der Spiegel, Kenneth C. Smith.

MONOGRAPHS AND BOOK CHAPTERS:

1. "Advances in Microelectronics - From Micro to Nanoscale Devices," in *Nanoscale Science and Engineering*, eds Di Ventra, S. Evoy, Heflin, chpt. 9, pp. 217-259, Kluwer Publishers, Boston, 2004.
2. "The ENIAC - History, Operation and Reconstruction in VLSI", J. Van der Spiegel, J. Tau, T. Alailima and L.P. Ang in *The First Computers--History and Architectures*, MIT Press, eds. R. Rojas, 2000.
3. "Neuromorphic Vision Sensors," R. Etienne-Cummings, J. Van der Spiegel, in *The Future of Sensors*, Elsevier Science Pub, Lausanne, 1996; also in *Sensors and Actuators A*, Vol. SNA056, pp.19-29, 1996.
3. "A General-Purpose Analog Neural Computer for Real-Time Spatiotemporal Pattern Analysis: Visual Motion Estimation", J. Van der Spiegel, R. Etienne-Cummings, C. Donham, A. Apsel, P. Mueller and D. Blackman, *Fuzzy Logic and Neural Network Handbook*, Ed. C.H. Chen, Chpt. 31 (pp. 31.1-31.21), Mc. Graw-Hill, New York, NY, 1996.
4. "New Information Technologies and Changes in Work," in *The Changing Nature of Work*, Ed. Ann Howard, Chapter 3 (pp. 97-112), Jossey-Bass Publ., San Francisco, 1995.
5. "Computational Sensors, the basis for truly intelligent machines," in *Intelligent Sensors*, Ed. H. Yamasaki, Handbook of Sensors and Actuators series, Vol. 3, pp. 19-38, Elsevier Publ., New York, 1996.
6. "A New Temporal Domain Optical Flow Measurement Technique for Focal Plane VLSI Implementation," R. Etienne-Cummings, S. Fernando, N. Takahashi, V. Shtonov, J. Van der Spiegel (Univ. of Penna.), and P. Mueller (Corticon, Inc.), in *Vision Chips: Implementing Vision Algorithms with Analog VLSI Circuits*, pp. 335-343, IEEE Press (Selected Reprint Volume), by C. Koch and H. Li, 1995.
7. "A Programmable Analog Neural Computer and Simulator," in *Artificial Neural Networks*, E. Sanchez-Sinencio and C. Lau, Eds., IEEE Press (Selected Reprint Volume), pp. 218-224, 1992, P. Mueller, J. Van der Spiegel, D. Blackman, T. Chiu, T. Clare, J. Dao, C. Donham, T-P. Hsieh and M. Loinaz.
8. "A Foveated Retina-Like Sensor Based on CCD Technology," in *Analog VLSI Implementation of Neural Systems*", eds. C. Mead and M. Ismail, Kluwer Academic Publ., Boston, MA, 1989, Chapter 8, pp. 189-210; also in *Vision Chips: Implementing Vision Algorithms with Analog VLSI Circuits*, pp. 442-465, IEEE Press (Selected Reprint Volume), by C. Koch and H. Li, 1995. J. Van der Spiegel, G. Kreider, C. Claeyss, I. Debusschere, G. Sandini, P. Dario, F. Fantini, P. Bellutti and G. Soncini.

9. "Design and Performance of Components for a General Purpose Analog Neural Computer," in *"Analog VLSI Implementation of Neural Systems,"* eds. C. Mead and M. Ismail, Kluwer Academic Publ., Boston, MA, 1989, Chapter 6, pp. 135-169; P. Mueller, J. Van der Spiegel, D. Blackman, T. Chiu, T. Clare, C. Donham, T. Hsieh and M. Loinaz.
10. *State of the Art of Sensor Research and Development,* Eds. S. Middelhoek and J. Van der Spiegel, Elsevier Sequoia, Lausanne, Switzerland, 1987.
11. "Ion Sensitive Field Effect Devices," *Encyclopedia of Medical Devices and Instrumentation,* Wiley-Interscience, New York, 1986. J. Van der Spiegel and J. Zemel.
12. "Recent Advances in Chemically Sensitive Electronic Devices," ACS Symp. Series Book on *Chemical Sensors - Fundamentals and Applications,* Book 309, Chapter 1, 1986. J. Zemel, J. Van der Spiegel, T. Fare and J. Young.
13. "Integrated Sensors," in *Microelectronics - Application, Materials and Technology,* Vol. 4, pp. 1-90, SRI, International, Menlo Park, 1985, J. Van der Spiegel.

OTHERS:

“Gate Circuits”. Entry in the McGraw-Hill Encyclopedia of Science and Technology, 2003; Jan Van der Spiegel

REFEREED CONFERENCE PROCEEDINGS: (*invited)

1. "Evaluation of Low Dark Current Charge-Coupled Devices," *Proceedings 3rd Intl. Conf. on CCD's,* pp. 23-30, Edinburg, 1976. G. Declerck, K. DeMeyer, E. Janssens, E. Laes, J. Van der Spiegel and C. Claeys.
2. "Discrete and Integrated Photosensitive Devices," Summer Course in *Solid-State Sensors and Transducers,* Vol. II, section XII, pp. 1-52, eds. W. Sansen and J. Van der Spiegel, Heverlee, June 8-11, 1982.
3. "A Shielded Piezoresistive Tactile Sensor Array," 3rd Intl. Conf. *Solid-State Sensors and Actuators,* Proc., pp. 26-29, Philadelphia, PA, June 11-14, 1985. K. Wong and J. Van der Spiegel.
4. "Multispecies Integrated Electrochemical Sensor With On-Chip CMOS Circuitry," 3rd Intl. Conf. *Solid-State Sensors and Actuators,* Proc. pp. 122-124, Philadelphia, PA, June 11-14, 1985. I. Lauks, J. Van der Spiegel, W. Sansen and M. Steyaert.
5. "Transient Processing of Titanium Silicides in a Non-Isothermal Reactor," *MRS Proceedings on Laser and Ion-Beam Interaction with Solids,* vol. 35, pp. 465-470, 1985. C.S. Wei, J. Van der Spiegel, J. Santiago and L. Seiberling.

6. "Fast Thermal Annealing of W-Ti Bilayers on Silicon," *MRS Proceedings on Rapid Thermal Processing*, Eds. T. Sedgwick, T. Seidel, and B.Y. Tsaur, Vol. 52, pp. 297-303, 1986. C.S. Wei, J. Van der Spiegel, M. Setton, J. Santiago, M. Tanielian and S. Blackstone.
- 7*. "The Role of Rapid Thermal Annealing of Silicides in VLSI," *Proc. 1st Congress of the Brazilian Microelectronics Society*, (plenary talk), pp. 656-670, Campinas, Brazil, July 15-17, 1986.
8. "Characterization of Tungsten Silicides Formed by Rapid Thermal Annealing," *MRS Proceedings on Rapid Thermal Processing*, Eds. T. Sedgwick, T. Seidel and B.Y. Tsaur, Vol. 52, pp. 289-295, 1986. M. Siegal, J. Santiago and J. Van der Spiegel.
9. "Spinned P(VDF-TrFE) Copolymer Layer for a Silicon-Piezoelectric Integrated Ultrasonic Transducer," *Proc. IEEE Ultrasonic Symp.*, p. 667-670, Denver, Oct. 14-16, 1987. A. Fiorillo, P. Dario, J. Van der Spiegel, C. Domenici and J. Foo.
10. "Titanium Based Ternary Silicides and Solid Solutions," *LeVide - LesCauches Mincees*, Vol. 42, No. 236, pp. 145-152, 1987. M. Setton, J. Van der Spiegel, J. Santiago and C.S. Wei.
11. "Uniform Tetragonal WSi Layers Formed by RTA," *MRS Proceedings on Beam and Solid Interactions*, Vol. 74, pp. 673-678, 1987 (Elsevier Publ.). M. Siegal, J.J. Santiago, J. Van der Spiegel, W. Graham, and M. Setton .
12. "Rapid Thermal Annealing of Sputtered Ti-Ni-Si Films," *MRS Proceedings on Beam and Solid Interactions*, Vol. 74, pp. 685-690, 1987 (Elsevier Publ.). M. Setton, E. Horace, J. Van der Spiegel, J.J. Santiago, J. Fischer and M. Siegal.
13. "Integrated Electrochemical Sensors," *Electrochem. Soc. Proc. on Sensor Science and Technology*, Vol. 87-15, pp. 31-39, Pennington, NJ, 1987. J. Van der Spiegel, I. Lauks, S. Yoder, C. More and J. McKeon.
14. "Electrochemical Microsensor Arrays for Biomedical Applications," *SPIE Proc. on Microsensors and Catheter Based Imaging Technology*, Vol. 904, pp. 6-12, 1988. J. Van der Spiegel, I. Lauks, H. Wieck, T. Dietz, M. Zelin and A. Turfa.
15. "Characteristics of Microfabricated Electrochemical Sensors," Vol. 1068, *SPIE Proc. Catheter Based Sensing and Imaging*, pp. 23-28, 1989. J. Van der Spiegel, I. Lauks, H. Wieck, N. Smit and S. Cozzette.
16. "A Programmable Analog Neural Computer and Simulator," in *Advances in Neural Network Information Processing Systems I*, ed. D. Touretzky, M. Kaufmann Publ., San Mateo, CA, pp. 712-719 (1989). P. Mueller, J. Van der Spiegel, D. Blackman, T. Clare, J. Dao, C. Donham, T.P. Hsieh and M. Loinaz.

17. "A Sub-Nanosecond Time-to-Voltage Converter and Analog Memory", *Proc. 1989 IEEE Intl. Symp. Circuits and Systems (ISCAS)*, pp. 268-271, Portland, OR, 1989. A. Stevens, R. Van Berg, J. Van der Spiegel and H. Williams.
18. "General Purpose Analog Neural Computer," *Proc. Intl. Joint Conf., Neural Networks (ICNN89)*, Vol. 2, pp. 177-182, Washington, DC, June 18-22, 1989. P. Mueller, J. Van der Spiegel, D. Blackman, T. Clare, J. Dao, C. Donham, T.P. Hsieh and M. Loinaz.
19. "Piezoelectric Copolymer Film on Silicon for Ultrasonic Transducers," *Ferro-electrics*, Vol. 92, pp. 65-66, 1989. A.S. Fiorillo, P. Dario and J. Van der Spiegel.
20. "Chemical and Physical Sensors for Potential Utilization in Process Control", *Proc. Instr. Systems Autom. Conf. - ISAI'89*, Philadelphia, PA, October 22-27, 1989. J.J. Santiago and J. Van der Spiegel.
21. "Epitaxial Growth of TbSi₂ on Si(111)," *MRS Symp. Proc.*, Vol. 160, p.293, 1990. F.H. Kaatz, W.R. Graham and J. Van der Spiegel.
22. "Metal/Silicide Interactions in the Ti-Co-Si System," *Proc. of MRS Symp.*, 1990. M. Setton, J. Van der Spiegel, R. Madar and O. Thomas.
23. "Structural Characterization of Ultrathin Epitaxial ErSi₂", *MRS Symposium Proc.*, Vol. 198, pp. 601, 1990. F.H. Kaatz, W.R. Graham and J. Van der Spiegel.
24. "A Retina-Like Space Variant CCD Sensor," *Proc. SPIE Conf. on Charge-Coupled Devices and Solid State Optical Sensors*, Vol. 1242, pp. 133-140, Santa Clara, CA, February 12-13, 1990. G. Kreider, J. Van der Spiegel, I. Born, C. Claeys, I. Debusschere, S. Sandini, P. Dario and F. Fantini.
- 25*. "Artificial Neural Networks: Principles and VLSI Implementation," *Proc. SPIE of Vth Congress of the Brazilian Society of Microelectronics SPIE*, Vol. 1405, pp. 184-197, Campinas, Brazil, July 1990, J. Van der Spiegel, P. Mueller, D. Blackman, C. Donham, R. Etienne-Cummings, P. Aziz, A. Choudhury, L. Jones and J. Xin.
26. "The Design and Characterization of a Space Variant CCD Sensor," *SPIE Conf. on Intelligent Robots and Computer Vision IX: Algorithms and Techniques*, Vol. 1381, pp. 242-249, Boston, November 1990. G. Kreider, J. Van der Spiegel, I. Born, C. Claeys, I. Debusschere, G. Sandini and P. Dario.
27. "A Multi-Chip Analog Neural Network," *Proc. 1991 Intl. Symp. on VLSI Tech., Systems and Applications*, pp. 64-68, Taipei, Taiwan, May 22-24, 1991, J. Van der Spiegel, P. Mueller, V. Agami, P. Aziz, D. Blackman, P. Chance, A. Choudhury, C. Donham, R. Etienne-Cummings, L. Jones, P. Kinget, M. Massa, W. von Koch and J. Xin.

28. "Design and Performance of a Prototype General Purpose Analog Neural Computer," *Proc. Intl. Joint Conf. on Neural Systems*, Vol. I, pp. 463-468, 1991. P. Mueller, J. Van der Spiegel, V. Agami, P. Aziz, D. Blackman, P. Chance, A. Choudhury, C. Donham, R. Etienne-Cummings, L. Jones, P. Kinget, W. von Koch, J. Kim and J. Xin.
29. "Design and Performance of a Prototype General Purpose Analog Neural Computer," *Proc. 2nd Intl. Conf. Microelectronics for Neural Networks*, pp. 347-357, Munich, Germany, October 16-18, 1991. P. Mueller, J. Van der Spiegel, V. Agami, D. Blackman, P. Chance, C. Donham, R. Etienne-Cummings, J. Flinn, J. Kim, M. Massa and S. Samarasekera.
30. "Design and Performance of a Prototype General Purpose Analog Neural Network," *Proc. 2nd Government Neural Network Application Workshop*, Huntsville, AL, 10-12, September 1991. P. Mueller, J. Van der Spiegel, V. Agami, D. Blackman, P. Chance, C. Donham, R. Etienne-Cummings, J. Flinn, J. Kim, M. Massa and S. Samarasekera.
31. "Study of Radiation Hard CMOS Process Under the Influence of Co⁶⁰ Irradiation," *Conf. Proc. of the IEEE Nucl. Science Symp.*, November 2-9, 1991. Vol. 3, pp. 1525-1529, 1991. T-Y. Yau, H.H. Williams, J. Van der Spiegel and R. Van Berg.
32. "Real Time Decomposition of Acoustical Patterns with an Analog Neural Computer," *SPIE Conf. on Applications of Artificial Neural Networks III*, Vol. 1709, pp. 758-769, 1992. P. Mueller, J. Van der Spiegel, D. Blackman, C. Donham and R. Etienne-Cummings.
33. "A Line and Edge Orientation Sensor," *Proc. Intl. Joint Conf. Neural Networks, IJCNN'92*, Vol. I, pp. 166-171, 1992. W.O. Camp, J. Van der Spiegel and M. Xiao.
34. "Real Time 2-D Analog Motion Detector VLSI Circuit," *Proc. Intl. Joint Conf. Neural Networks, IJCNN'92*, Vol. IV, pp. 426-431, 1992. R. Etienne-Cummings, S.A. Fernando, J. Van der Spiegel and P. Mueller.
35. "A CMOS Time Measurement System with Analog Memory for Particle Physics Detectors," *1992 IEEE Nuclear Science Symp. and Medical Imaging Conf. Proc.*, Vol. I, pp. 390 - 392, October 1992. E. Gerds, J. Van der Spiegel, H. Williams and R. Van Berg.
36. "A Silicon VLSI Optical Sensor Based on Mammalian Vision," *Parallel Problem Solving from Nature*, 2, Eds. R. Manner and B. Manderick, pp. 603-612, North-Holland Publ., Amsterdam, 1992. W.O. Camp, J. Van der Spiegel and M. Xiao.
- *37. "Computational Sensors of the 21st Century," *Proc. Intl. Symp. Sensors in the 21st Century*, pp. 51-59, *Jap. Electr. Development Assoc.*, Tokyo, 1992; also published in

- J. of the Japanese Electronic Industry Development Association, Vol. 35 no. 7, pp. 36-51, 1993 (translated in Japanese).
38. "A CMOS Silicon VLSI Optical Sensor," *Proc. 1992 IEEE Intl. Conf. on Systems, Man and Cybernetics*, pp. 25-30, Chicago, October 19-21, 1992. W.O. Camp and J. Van der Spiegel.
 39. "A CMOS Time to Digital Converter with Analog Memory for High Energy Physics Particle Detectors," *Proc. of Supercollider 5*, ed. P. Hale, Plenum Press, New York, 1993. E.J. Gerds, J. Van der Spiegel, H.H. Williams and R. Van Berg.
 40. "A Silicon VLSI Optical Sensor for Pattern Recognition," *Proc. Intl. Solid State Sensors Conf.*, Transducers 1993, Yokohama, pp.1066-1069, June 7-10, 1993. W.O. Camp and J. Van der Spiegel.
 41. "A Neural Network Based Intelligent Acoustic Sensor," *Proc. SENSOR EXPO*, Philadelphia, October 26-28, 1993. C. Donham, J. Van der Spiegel, P. Mueller, C. Rothey and M. Thompson.
 42. "VLSI Implementation of a Focal Plane Motion Sensor," *Proc. SENSOR EXPO*, Philadelphia, October 26-28, 1993. R. Etienne-Cummings, S. Fernando, J. Van der Spiegel and P. Mueller.
 43. "A General Purpose Analog Neural Computer and a Silicon Retina for Real-Time Target Acquisition, Recognition and Tracking," *Proc. Comp. Architecture for Machine Perception 1993 (CAMP'93)*, M. Bayoumi, L. Davis and K. Valavanis (Eds.), pp. 48-58, December 1993. R. Etienne-Cummings, J. Van der Spiegel, C. Donham, S. Fernando, R. Hathaway (Univ. of Penna.); and P. Mueller and D. Blackman (Corticon, Inc.).
 44. "A New Temporal Domain Optical Flow Measurement Technique for Focal Plane VLSI Implementation," *Proc. Comp. Architecture for Machine Perception 1993 (CAMP'93)*, M. Bayoumi, L. Davis and K. Valavanis (Eds.), pp. 241-250, December 1993. R. Etienne-Cummings, S. Fernando, N. Takahashi, V. Shtonov, J. Van der Spiegel (Univ. of Penn.); and P. Mueller (Corticon, Inc.); included in the IEEE book on Vision Chips: Implementing Vision Algorithms with Analog VLSI Circuits, pp. 335-343, Ed. by C. Koch and H. Li, 1995.
 - 45*. "Large Scale Analog Neural Computer with Programmable Architecture and Programmable Time Constants for Temporal Pattern Analysis" *Proc. IEEE Intl. Conf. on Neural Networks, ICNN'94*, Vol. 3, pp. 1830-1835, 1994. J. Van der Spiegel, C. Donham, R. Etienne-Cummings, S. Fernando, P. Mueller and D. Blackman .
 - 46*. "Spatiotemporal Computation with a General Purpose Analog Neural Computer: Real-Time Visual Motion Estimation," *IEEE Intl. Conf. on Neural Networks*,

- ICNN'94, Vol. 3, pp. 1836-1841, 1994. R. Etienne-Cummings, C. Donham, J. Van der Spiegel and P. Mueller.
47. "Multi Band Sigma Delta Analog to Digital Conversion," *Proc. IEEE Intl. Conf. on Acoustics, Speech and Signal Processing (ICASSP)*, Vol. 3, pp. 249-252, 1994. P. Aziz, H. Sorensen and J. Van der Spiegel.
 48. "Pattern Recognition based on Orientation and Linestops using an Orientation Sensor and Multilayered Neural Network," *SPIE Proc. on Optical Pattern Recognition IV*, Vol. 2490, pp. 365-374, April 1995. M. Nishimura and J. Van der Spiegel.
 49. "Real-time Visual Target Tracking: Two Implementations of Velocity-Based Smooth Pursuit," *SPIE Proc. on Visual Information Processing IV*, Vol. 2488, Friedrich O. Huck and Richard D. Juday, eds., pp. 297-308, April 1995. R. Etienne-Cummings, P. Longo, J. Van der Spiegel and P. Mueller
 50. "Real Time Feature Extraction of Acoustic Signals with an Analog Neural Computer," in *Proc. IEEE Intl. Symposium on Circuits and Systems (ISCAS)*, May 1995. C. Donham, J. Van der Spiegel, P. Mueller and Z. Walton.
 51. "Performance of Complex Noise Transfer Functions in Bandpass and Multi Band Sigma Delta Systems," in *Proc. IEEE Intl. Symposium on Circuits and Systems (ISCAS)*, Vol. 1, pp. 641-644, 1995. P. Aziz, H. Sorensen and J. Van der Spiegel.
 52. "Automatic Real-Time Phoneme Recognition," *Proc. 9th Natl. Conf. Undergraduate Research*, Vol. II, pp. 753-756, 1995. Z. Walton and J. Van der Spiegel
 53. "A Programmable Analog Neural Computer with Applications to Speech Recognition," *Proc. Comp. & Info. Sci. Symp. (CISS)*, J. Hopkins, May 1995. P. Mueller, J. Van der Spiegel, D. Blackman, C. Donham and R. Etienne-Cummings.
 54. "A Visual Smooth Pursuit Tracking Chip", *NIPS 1995, Advances in Neural Information Processing Systems*, Vol. 8, D.S. Touretzky, M.C.Mozer and M.E. Hasselmo, eds., MIT Press, pp. 706-712, 1996. R. Etienne-Cummings, J. Van der Spiegel and P. Mueller.
 55. "Eniac-on-a-Chip" *Proc. 10th Natl. Conf. Undergraduate Research*, Vol. , pp. , 1996. Lin Ping Ang and J. Van der Spiegel
 56. "VLSI Implementation of Cortical Visual Motion Detection Using an Analog Neural Computer," R. Etienne-Cummings, J. Van der Spiegel, P. Mueller, *NIPS 1996*.
 57. "A Foveated Visual Tracking Chip", *Technical Digest, Intern. Solid-State Circuits Conference (ISSCC97)*, pp. 38-39, 1997; R. Etienne-Cummings, J. Van der Spiegel, M. Zhang, P. Mueller.

58. "A Silicon VLSI Optical Sensor for Image Decomposition," Proc. 15th Sensor Symposium, pp.115-118 , Kawasaki, Japan, June 1997; M. Nishimura, K. Sunamura and J. Van der Spiegel
- 59*. "Smart Sensors and Biologically Inspired Algorithms", Tech. Digest. 15th Sensor Symposium, pp. 7-17, Inst. Electr. Eng. Japan, Kawasaki, Japan, June 1997; J. Van der Spiegel, R. Etienne-Cummings and M. Nishimura. (Invited)
60. "Neuromorphic and Digital Hybrid Systems", 1st European Workshop on Neuromorphic Systems, Stirling, Scotland, August 29-31, 1997; published in *Neuromorphic Systems: Engineering Silicon from Neurobiology*, L. Smith and A. Hamilton (Eds.), World Scientific, 1998; R. Etienne-Cummings, J. Van der Spiegel and P. Mueller.
61. "VLSI Implementation of Cortical Visual Motion Detection Using an Analog Neural Computer," *Advances in Neural Information Processing Systems 9*, M. Mozer, M. Jordan and T. Petsche (Eds.), MIT Press, pp. 685-69; R. Etienne-Cummings, J. Van der Spiegel, P. Mueller.
62. "SUNFEST - Research Experience for Undergraduates", Proc. Frontiers in Education Conference (FIE), Pittsburgh, Nov. 1997, J. Van der Spiegel, J. Santiago and J. Zemel. (Sollicited paper)
63. "A VLSI Feature Detection Chip based on Orientation Decomposition", Proc.of the 1998 IEICE (Inst. of Electronics, Information and Communication Engineers) General Conference, p.178; M. Nshimura, K. Sunamura and J. Van der Spiegel.
64. "An Acoustic-Phonetic Feature-Based System for the Automatic Recognition of Fricative Consonants," Proc. ICASSP-98, pp. 961-964, May 1998, Seattle, WA; ; A. M. Abdelatty Ali, J. Van der Spiegel and Paul Mueller.
65. "An Optical Feature Detection Sensor Based on Orientation Decomposition", Tech. Digest 16th Sensor Symposium, June 203, 1998, pp. 89-94, Kawasaki, Japan; M. Nishimura, K. Sunamura, J. Van der Spiegel.
66. "Acoustic-Phonetic Features for Automatic Recognition of Stop Consonants" Proc. 16th International Congress on Acoustics (ICA) and the 135th Meeting of the Acoustical Society of America (ASA), pages 275-276, June 1998, Seattle, WA; A. M. Abdelatty Ali, J. Van der Spiegel and Paul Mueller.
67. "Design procedure for current-mode processing circuits based on transistor mismatch analysis" Proceedings of the 1999 IEICE General Conference, Electronics 2, p.159 March 25-28, Yokohama, JAPAN, 1999. Masatoshi Nishimura and Jan Van der Spiegel

- *68. "Auditory-Based Acoustic-Phonetic Feature Extraction for the Segmentation and Recognition of Continuous Speech", The 33rd Annual Conference on Information Sciences and Systems, CISS99, March 17-19, 1999, J. Hopkins Univ., Baltimore; A. M. Abdelatty, J. Van der Spiegel and P. Mueller.
69. "The ENIAC - History, Operation and Reconstruction in VLSI," Int. Conference on the History of Computing, Paderborn, Germany, August 14-16, 1998.
70. "A GUI System for Speech Synthesis through Graphical Manipulation of Spectrograms", IEEE ISCAS, May, 1999, Proc. . Vol. III, pp.106-109, A. M. Abdelatty, Gavin Haentjens, O'Neil Palmer, Kelum Pinnaduwege, J. Van der Spiegel and P. Mueller.
71. "An Acoustic-Phonetic Feature-based System for Automatic Phoneme Recognition in Continuous Speech," IEEE ISCAS, May, 1999, Proc. Vol. III, pp. 118-121, A. M. Abdelatty, J. Van der Spiegel, Gavin Haentjens, J. Berman and P. Mueller.
72. "A Low-Voltage/Low-Power Second-Order Delta-Sigma Modulator with Signal Adaptive Control Architecture," IEEE ISCAS, May, 1999, Proc. Vol. II, pp. 41-44. Q. Li, J. Van der Spiegel and K. R. Laker.
73. "A VLSI Optical Sensor which counts the Number of Objects", IEEE Int. Conf. Solid-State Sensors and Actuators, Transducers 99, Sendai, Japan, June 1999, M. Nishimura, K. Sunamura and J. Van der Spiegel.
74. "Automatic Detection and Classification of Stop Consonants using an Acoustic-Phonetic Feature-based System," Proc. XIVth Int. Congress on Phonetic Sciences (ICPhS'99), pp. 1709-1712, San Francisco, August 1999; A. M. Ali, J. Van der Spiegel and P. Mueller.
75. "Auditory-Based Speech Processing Based On The Average Localized Synchrony Detection", Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing, Istanbul, June 5-9, 2000, Proc. ICASSP 2000, Vol. 3, pp. 1623-1626, 2000; A. M. Abdelatty Ali, J. Van der Spiegel and Paul Mueller.
76. "Robust Classification of Stop Consonants using Auditory-based Speech Processing", Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP-2001), vol.1, pp. 81-84, Salt Lake City, May, 2001. A.M. Abdelatty Ali, Jan Van der Spiegel and Paul Mueller.
77. "A 1.2V, 3.8 μ W Second-Order Delta-Sigma Modulator with Signal Adaptive Control Architecture, Proc. IEEE Workshop on Low Voltage, Low Power mixed-Signal Circuits and Systems, Dallas, March 2001, Q. Li, Jan Van der Spiegel and Ken R. Laker.

- 78*. "Auditory-based signal processing for robust speech recognition", 35th Annual Conference on Information Sciences and Systems (CISS) - Neuromorphic Engineering and MEMS Sensory Systems, March 2001, Baltimore; A.M. Abdelatty Ali, Jan Van der Spiegel and Paul Mueller.
79. "Background Digital Error Correction for Pipelined Analog-to-Digital Converters", IEEE Int. Symp. Circuits and Systems, ISCAS2001, pp. I-408-411, May 6-9, Sydney, Australia, S. Sonkusale, J. Van der Spiegel and K. Nagaraj.
80. "Fully Integrated CMOS Phase Locked Loop with 30MHz to 2GHz Locking Range and +/-35ps Jitter", IEEE Int. Conf. Electronics, Circuits and Systems, ICECS2001, Malta, Sept. 2001, vol. 1, pp. 55-58; Chao Xu, Winslow Sargeant, K. Laker and J. Van der Spiegel.
81. "A Low Distortion MOS Sampling Circuit", IEEE Int. Symposium on Circuits and Systems - ISCAS, May 2002, Vol. 5, pp. 585 -588; Sameer Sonkusale and Jan Van der Spiegel.
82. "Analysis of Clock Buffer Phase Noise", IEEE Int. Symposium on Circuits and Systems - ISCAS, May 2002, Vol. 5, pp. 657 -660; Chao Xu, F. Barber, W. Sargeant, K. Laker and J. Van der Spiegel.
83. "An Extended Frequency Range CMOS Voltage-Controlled Oscillator", 9th IEEE International Conference on Electronics, Circuits and Systems Conf - ICECS 2002, Proc. Volume: 2 , pp. 15-18 , Sept. 2002; Chao Xu, W. Sargeant, K. Laker and J. Van der Spiegel.
- 84*. "Biologically Inspired Vision Sensors", Proc. 23rd Int. Conf. On Microelectronics MIEL02), pp. 125-131, Vol.1 , Nis, Yugoslavia, May 2002; J. Van der Spiegel, R. Etienne-Cummings and M. Nishimura.
- 85 "Mixed-signal calibration of pipelined analog-digital converters, S. Sonkusale, J. Van der Spiegel; Proceedings. IEEE International SOC [Systems-on-Chip] Conference, 17-20 Sept. 2003.
- 86*. " Biologically Inspired Vision Sensor for the Detection of Higher-Level Image Features, Proc. of the IEEE Conf. Electron Devices and Solid-State Circuits, pp. 11-16, Hong Kong, Dec. 16-18, 2003. Jan Van der Spiegel and M. Nishimura. [Plenary talk].
87. "Non-Parallel Training For Voice Conversion By Maximum Likelihood Constrained Adaptation", A. Mouchtaris, J. Van der Spiegel and Paul Mueller, Proc. IEEE Int. Conference on Acoustics, Speech and Signal Processing (ICASSP04), Montreal, May 17-21, vol. 1, pp. 1-4, 2004.

88. "A Spectral Conversion Approach to The Iterative Wiener Filter for Speech Enhancement," A. Mouchtaris, J. Van der Spiegel and Paul Mueller, Proc. of IEEE Int. Conf. on Multimedia and Expo (ICME2004), pp. 1971-1974, Taipei, Taiwan, June 27-30, 2004
89. "A 50MS/s 12-bit CMOS Pipeline A/D Converter with Nonlinear Background Calibration," IEEE Custom Integrated Circuit Conference (CICC 2005), Sept. 2005, Jie Yuan, N. Farhat and J. Van der Spiegel.
90. "Combined Software/Hardware Implementation of a Filterbank Front-End for Speech Recognition", *Proc. IEEE Workshop on Signal Processing Systems (SIPS2005)*, pp. 436-441, November 2-4, Athens Greece, November 2005; A. Mouchtaris, Y. Cao, S. Khan, J. Van der Spiegel, and P. Mueller.
91. "A Spectral Conversion Approach to Feature Denoising and Speech Enhancement", *Prod. 9th European Conference on Speech Communication and Technology (EUROSPEECH)*, pp. 2057-2060, September 4-8, 2005, Lisbon; A. Mouchtaris, J. Van der Spiegel, P. Mueller, and P. Tsakalides.
92. "Extrapolating Analog-to-Digital Converter", *Proc. IEEE Int'l Midwest Symposium on Circuits & Systems (MWSCAS 2005)*, pp. 847-850, Cincinnati, Ohio, Aug 7 - 10, 2005; Zheng Yang, Jan Van der Spiegel.
93. "Real-time extraction of polarimetric information at the focal plane," SPIE Defense and Security Symposium on "Polarization: Measurement, Analysis, and Remote Sensing VII" 17-22 April 2006, Orlando, Florida; Viktor Gruev, Jan Van der Spiegel and Nader Engheta.
94. "Fabrication of a Thin Film Micro Polarization Array," V. Gruev, K. Wu, J. Van der Spiegel and N. Engheta, *Proc. IEEE Int. Symp. Circuits and Systems (ISCAS)*, pp. 209-212, May 2006.
95. "Image Sensor with Focal Plane Extraction of Polarimetric Information," V. Gruev, J. Van der Spiegel and N. Engheta, *Proc. IEEE Int. Symp. Circuits and Systems (ISCAS)*, pp. 213-216, May 2006.
96. "A CMOS Monolithic Implementation of a Nonlinear Element for Arbitrary 1-D Map Generation", Jie Yuan, N. Farhat and J. Van der Spiegel, *Proc. IEEE Int. Symp. Circuits and Systems (ISCAS)*, pp. 2765-2768, May 2006.
97. "A CMOS Monolithic Implementation of a Nonlinear Interconnection Module for a Corticonic Network," Jie Yuan, N. Farhat and J. Van der Spiegel, *Proc. IEEE Int. Symp. Circuits and Systems (ISCAS)*, pp. 2769-2772, May 2006.

98. "A CMOS Linear Voltage/Current Dual-Mode Imager," Zheng Yang, V. Gruev, Jan Van der Spiegel, Proc. IEEE Int. Symp. Circuits and Systems (ISCAS), pp. 3574-3577, May 2006.
99. "Image Sensor with General Spatial Processing in a 3D Integrated Circuit Technology," V. Gruev, R. Philipp, J. Van der Spiegel and R. Etienne-Cummings; Proc. IEEE Int. Symp. Circuits and Systems (ISCAS), pp. 4963-4966, May 2006.
100. * "Biologically Inspired Vision Sensors – Strategies of the Biological Sensory System, and CMOS Implementations", J. Van der Spiegel, V. Gruev and N. Nishimura, Proc. of the IBERSENSORS 2006 Conf, pp. 1-9, Montevideo, Sept, 27-29, 2006 [Keynote talk].
101. "Low Fixed Pattern Noise Current-mode Imager Using Velocity Saturated Readout Transistors" Zheng Yang, Viktor Gruev and Jan Van der Spiegel, Proc. IEEE Int. Symp. Circuits and Systems (ISCAS), pp. 2842-2845, May 2007 [2007 Best Paper Award of the Sensory Systems Technical Committee of the IEEE Circuits and Systems Society].
102. "Two Transistor Current Mode Active Pixel Sensor", Zheng Yang, Viktor Gruev, Jan Van der Spiegel and Ralph Etienne-Cummings, Proc. IEEE Int. Symp. Circuits and Systems (ISCAS), pp. 2846-2849, May 2007
103. "Cort-X II: Low Power Element Design of a Large-Scale spatio-Temporal Pattern Clustering System.," Jie Yuan, Ning Song, Nabil Farhat, Jan Van der Spiegel; Proc. IEEE Int. Symp. Circuits and Systems (ISCAS), pp. 1017-1020, May 2007

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.*, Campinas, 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.

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, *15th 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 TiSi₂," *Proc. of the Electrochem. Soc.*, Montreal, Quebec, Abstract 157, 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.

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 Pennsylvania, 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. "Computational 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 Systems 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", Philomethan 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.