

## **Jiann-Shiun (Peter) Yuan**

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### **Field of Expertise and Interest**

Nanoelectronics Device and Circuit Reliability, Device Modeling and Simulation; RF, Analog, and Digital Circuit Design and Analysis, DC-DC Synchronous Buck Converters, and Mixed-Signal Design for Biomedical Applications

### **Education**

Ph.D. (Electrical Engineering), University of Florida, 12/88  
M.S. (Electrical Engineering), University of Florida, 12/84  
B.S. (Marine Electronic Engineering), National Taiwan Ocean University, 6/80

### **Research and Work Experience**

8/01 - present	Department of Electrical Engineering and Computer Science University of Central Florida <i>Professor and Director of Nanoelectronics Reliability Laboratory</i>
8/95 - 7/01	Department of Electrical and Computer Engineering University of Central Florida <i>Associate Professor</i>
1/90 - 7/95	Department of Electrical and Computer Engineering University of Central Florida <i>Assistant Professor</i>
5/91 - 8/91	Applied Research Center Land Mobile Group, Motorola <i>Visiting Researcher</i>
11/88 -12/89	MOS Memory Research and Development Texas Instruments <i>Design Engineer</i>
12/83 - 11/88	Department of Electrical Engineering University of Florida <i>Research Assistant</i>

## **Honors and Awards**

- TIP Award, University of Central Florida, 2009-2010
- Distinguished Lecturer, IEEE Electron Devices Society, March 2006-present
- TIP Award, University of Central Florida, 2003-2004
- Research Incentive Award, University of Central Florida, 2002-2003
- Distinguished Research Lecturer, College of Engineering and Computer Science, University of Central Florida, 2003
- Outstanding Engineering Award, IEEE Orlando Section, 2002
- Distinguished Researcher Award, College of Engineering and Computer Science, 2001-2002
- Graduate Teaching Award, ECE Dept. University of Central Florida, 1999
- Who's Who in Science and Engineering, 1997-present
- Outstanding Teacher, ECE Dept., University of Central Florida, 1997
- Who's Who in American Education, 1996-present
- Distinguished Researcher Award, ECE Dept., University of Central Florida, 1996
- TIP Award, University of Central Florida, 1995-1996
- Who's Who in American Men and Women of Science, 1995-present
- Engineering Faculty Internship Award, National Science Foundation, 1994
- Outstanding Engineering Educator Award, Florida Council of IEEE (FCIEEE), 1993
- Outstanding Engineering Educator Award, IEEE Orlando Section, 1993
- Distinguished Researcher Award, ECE Dept., University of Central Florida, 1993
- International Man of the Year, 1992-1993
- Senior Member grade of IEEE, 1992
- Eminent Engineer, Tau Beta Pi, Florida Delta Chapter, 1992
- Summer Research Faculty, Applied Research Center, Motorola, 1991
- Best Paper Award, central Florida Chapter, American Society of Engineering Education, 1991
- Outstanding Ph.D. Dissertation Award, EE Dept., University of Florida, 1989

## **Invited Seminars and Papers Given**

- “CMOS RF circuit design for reliability and variability,” National Chiayi University, Taiwan, November 21, 2012
- “RF wireless communication ICs for information system,” I-Shou University, Kaohsiung, Taiwan, November 22, 2012
- “CMOS RF circuit design for reliability and variability,” MStar Semiconductors, Hsinchu, Taiwan, December 21, 2011
- “CMOS RF circuit design for reliability and variability,” IEEE Distinguished Lecture, National Sun-Yat-Sen University, Taiwan, May 10, 2011; National University of Kaohsiung, Taiwan, May 11, 2011, National Kaohsiung Normal University, Taiwan, May 12, 2011, National Taiwan University of Science and Technology, May 16, 2011
- “CMOS RF circuit reliability,” IEEE Distinguished Lecture, CEPREI, Guangzhou, China, July 10, 2010
- “Semiconductor device and circuit reliability,” Invited Talk, Hwan-Chung University Science and Technology, Hubei, China, July 13, 2010

- “CMOS circuit reliability,” IEEE Distinguished Lecture, National Device Laboratories, Hsinchu, Taiwan, November 10, 2009; Feng-Chia University, Taichung, Taiwan, November 11, 2009
- “LDMOS reliability in synchronous DC-DC buck converters,” National University of Kaohsiung, Taiwan, November 13, 2009
- “CMOS circuit reliability,” Peking University Shanghai Microelectronics Institute, Shanghai, China, July 3, 2009
- “LDMOS reliability in synchronous DC-DC buck converters,” Zhejiang University, Hangzhou, China, July 6, 2009
- “CMOS device and circuit reliability,” IEEE Distinguished Lecture, Peking University, Beijing, China, December 17, 2008; Tsinghua University, Beijing, China, October 20, 2008
- “CMOS device and circuit reliability,” IEEE Distinguished Lecture, National Cheng-Kung University, Tainan, Taiwan, May 6, 2008, National University of Kaohsiung, Kaohsiung, Taiwan, May 7, 2008, and National Sun Yat-Sen University, Kaohsiung, Taiwan, May 8, 2008
- “DFR for RF applications,” UMC, Taiwan, December 18, 2007
- “HfO<sub>2</sub> CMOS device and circuit reliability,” Taiwan Semiconductor Manufacturing Company (TSMC), Taiwan, December 19, 2007
- “HfO<sub>2</sub> CMOS device and circuit reliability,” IEEE International Electron Devices and Solid-State Circuits Conference, Tainan, Taiwan, December 20-22, 2007
- “RF CMOS device and circuit reliability,” ECE Seminar, University of Central Florida, February 18, 2005
- “RF CMOS device and circuit reliability subject to electrical and temperature stresses,” *Microelectronic Reliability & Qualification Workshop*, Manhattan Beach, CA, December 7-8, 2004
- “CMOS RF Device and Circuit Reliability,” *11<sup>th</sup> IEEE International Symposium on Electron Devices for Microwave and Optoelectronic Applications*, Orlando, Florida, November 17-18, 2003
- “Overview of SiGe Technology Modeling and Application,” *First International Symposium on Quality of Electronic Design*, San Jose, California, March 20-22, 2000
- “Study of SiGe Heterojunction Bipolar Transistors in BiCMOS Process for Wireless Telecommunication Applications,” Lucent Technologies, Orlando, FL, July 20, 1998
- "Heterojunction Bipolar Transistor Modeling and Analysis," Motorola, Plantation, FL, 4/93
- “Scalable Bipolar Transistor Model for Circuit Simulation,” National Semiconductor, Santa Clara, CA, 11/95
- "Delay Analysis of BiNMOS Driver including High Current Transients and Temperature Dependence", National Semiconductor, Santa Clara, CA, 11/91
- "HBT Performance, Modeling and Applications," Motorola, Boynton Beach, FL, 7/91

### **Courses Taught**

EEL 6338 - Advanced Topics in Microelectronics: GaAs Heterojunction Devices and Circuits

EEL 6338 - Advanced Topics in Microelectronics: Advanced Semiconductor Device Simulation

EEL 6371 - Advanced Electronics I

EEL 5353 - Semiconductor Device Modeling and Simulation

EEL 5378 - CMOS Analog and Digital IC Design  
EEL 4309 - Electronics II  
EEL 4314 – Device Electronics  
EEL 3307 - Electronics I  
EEL 3306 - Semiconductor Devices I  
EEL 3004 – Electrical Network

### **Courses Developed at UCF**

EEL 5353 - *Semiconductor Device Modeling and Simulation*

(This course provides a bridge between device physics and circuit design. The course teaches the students large and small signal models including semiconductor diodes, BJTs, and MOSFETs. Parameter extraction, numerical algorithm, and SPICE simulation are included.)

EEL 5378 - *CMOS Analog and Digital IC Design*

(This course provides the students updated knowledge in advanced CMOS technology. The objective of this course is to present the principles and techniques of the design of analog and digital circuits that are implemented in a CMOS technology.)

EEL 6338 - *Advanced Topics in Microelectronics: GaAs Heterojunction Devices and Circuits*

(The advanced topics provide the students to familiarize with the most advanced semiconductor technology using III-V compound devices. Heterostructure devices such as heterojunction bipolar transistors and high electron mobility transistors are introduced in this class. Heterojunction device physics, device modeling, and device and circuit design are included.)

### **Development of Laboratory Manual**

EEL 3307 - Electronics I, revised summer 2011

### **Development of Laboratory**

#### **Device and Circuit Characterization and Reliability Laboratory**

This lab is equipped with Cascade Semi-Automatic Probe Station, Agilent 85107B Network Analyzer System (45 MHz to 50 GHz), Agilent 4156B Parameter Analyzer, Agilent 8564EC Spectrum Analyzer (to 40 GHz), Agilent 4284A Precision LCR Meter, Agilent 8133A Signal Generator (2 GHz), Agilent N8975A Noise Figure Analyzer (40 GHz), Agilent Infiniium 54832B Digital Oscilloscope (1 GHz), IFI TEM cell, and Laser Scanning Microscope as well as state-of-the-art design automation software from Cadence, Synopsys, and Agilent Technologies.

### **Theses and Dissertations Supervisions**

summary: directed 2 postdoc research, 20 Ph.D. Dissertations, 30 Master Theses, 5 Undergraduate Honor Theses, and 6 NSF REU student reports

Currently, 4 Ph.D. students are in progress

- postdoc. research, Dr. Minguo Liu, 9/98-3/99

- postdoc. research, Dirk Nuernbergk, 8/97-12/97
- visiting scholar, Min Wang, 1/12-1/13
- visiting scholar, Dejie Shi, 10/11-9/12
- visiting scholar, Yibing Shi, 3/98-2/99
- visiting scholar, Bowen Zhang, 8/93-7/94
- Ph.D. Dissertation, Shuyu Chen, “RF Power amplifier and oscillator design for reliability and variability,” May 2013
- Ph.D. Dissertation, Gabriel Vazquez Ramos, “Wireless power transfer for space applications: System design and electromagnetic compatibility compliance of radiated emissions,” August 2012
- Ph.D. Dissertation, Hongxia Tang, “Study of design for reliability of RF and analog circuits,” May 2012
- Ph.D. Dissertation, Yidong Liu, “CMOS RF circuit variability and reliability resilient design, modeling, and simulation,” May 2011
- Ph.D. Dissertation, Jun Ma, “Study of gate oxide breakdown and hot electron effect on CMOS circuit performances,” December 2009
- Ph.D. Dissertation, Liangjun Jiang, “Study of hot electron effect on LDMOS transistor performance,” May 2007
- Ph.D. Dissertation, Chuanzhao Yu, “Study of nano-scaled CMOS device and circuit reliability”, May 2006
- Ph.D. Dissertation, Yi Liu, “Study of oxide breakdown, hot carrier and NBTI effects on MOS device and circuit reliability,” May 2005
- Ph.D. Dissertation, Anwar Sadat, “Low power CMOS circuit design and reliability analysis for wireless MEMS sensors,” December 2004
- Ph.D. Dissertation, Hong Yang, “CMOS device and circuit reliability analysis,” December 2004
- Ph.D. Dissertation, Jia Di, “Energy aware design and analysis of synchronous and asynchronous circuits,” May 2004
- Ph.D. Dissertation, Weidong Kuang, “Design and analysis of delay-insensitive NCL ring and energy-efficient circuits,” December 2003
- Ph.D. Dissertation, Li Yang, “Analysis and design of digital circuits for low switching noise,” August 2003
- Ph.D. Dissertation, Enjun Xiao, “CMOS RF circuit design and reliability for wireless communications,” May 2003
- Ph.D. Dissertation, Wen Wu, “Copper interconnect reliability on integrated circuits,” December 2002
- Ph.D. Dissertation, Qiang Li, “CMOS RF front-end IC design and reliability for portable wireless receiver,” December 2001
- Ph.D. Dissertation, Jinlong Zhang, “Gate oxide integrity for deep submicron CMOS device/circuit reliability,” May 2001
- Ph.D. Dissertation, Jiling Song, “Analysis and modeling of SiGe HBTs,” August 1998
- Ph.D. Dissertation, Yong Dai, “A scalable bipolar transistor model including quasi-saturation and high current effects of bipolar and BiCMOS circuit applications,” August 1996

- Ph.D. Dissertation, Jinghui Ning, "High performance heterojunction bipolar transistor model development," May 1996
- M.S. Thesis, Alan Gibsons, Jr., "Design and simulation of CMOS active RF mixers," December 2011
- M.S. Thesis, Jason Steighner, "Investigation and trade study on hot carrier reliability of pHEMT for DC and RF performance," August 2011
- M.S. Thesis, Giji Skaria, "Class F and inverse class F power amplifiers subject to electrical stress effect," August 2011
- M.S. Thesis, Yiheng Wang, "Design and analysis of 5.8GHz high linearity power amplifier with an on-chip linearizer," May 2011
- M.S. Thesis, Divya Narasimha Raju, "Study of ESD effects on RF power amplifiers," May 2011
- M.S. Thesis, Shauna McCartney, "The simulation and control of a grid-connected wind energy conversion system," December 2010
- M.S. Thesis, Karan Kutty, "Class-E cascode power amplifier analysis and design for long term reliability," August 2010
- M.S. Thesis, Mark Corey, "Conventional and ZVT synchronous buck converter design, analysis, and measurement," May 2010
- M.S. Thesis, Smitha Krishnamurthy, "Solar and fuel cell circuit modeling, analysis and integrations with power conversion circuits for distributed generation," August 2009
- M.S. Thesis, Yidong Liu, "Study of InGaAs LDMOS for power conversion applications," August 2009
- M.S. Thesis, Yinxin Yu, "Study of negative bias temperature instability and fast charge trapping effect on nanoelectronics reliability", December 2007
- M.S. Thesis, Lin Shen, Hot electron stress effect on low-noise amplifier RF performances under weak and strong inversions, May 2006
- M.S. Thesis, Rajeev Verma, "Design low voltage, high speed, and high resolution CMOS comparable using 0.18  $\mu\text{m}$  technology," May 2004
- M.S. Thesis, Ranganath Panchangam, "Analysis of low power digital circuit design," May 2004
- M.S. Thesis, Akarsh Reddy, Globally-asynchronous, locally-synchronous wrapper configurations for point-to-point and multi-point data communication," December 2004
- M.S. Thesis, Wade Randall Smith, "Analysis of oxide breakdown effect on class-E power amplifiers," December 2003
- M.S. Thesis, Fei Liu, "Noise and linearity analysis for RF CMOS mixers," August 2003
- M.S. Thesis, Hong Yang, "Hot electron effects on circuit reliability," May 2002
- M.S. Thesis, Ning Weng, "Energy efficient design and analysis for delay-insensitive digital circuits," December 2000
- M.S. Thesis, Jignesh Soncharatra, "Signal integrity in deep submicron CMOS chip design," December 2000
- M.S. Thesis, Kongfan Pan, "System design of an ATM over satellite interconnect device," April 2000

- M.S. Thesis, Aleksandar Hadzibabic, “Testing of delay-insensitive asynchronous circuits,” April 2000
- M.S. Thesis, Mir M. Mahin, “Analysis and modeling of substrate noise coupling in mixed-signal ICs,” April 1998
- MS Thesis, Yuhua Gu, “Hot electron effects on submicron n-MOSFETs including gate oxide thickness dependence,” August 1996
- MS Thesis, Rafik Awadallah, “SOI MOS transistor model including self-heating effects,” August 1996
- MS Thesis, Long Nguyen, “Analog performance of BiCMOS circuits,” December 1994
- MS Thesis, Chandrasekaran Panchapakesan, “Thermal and intermodulation analysis of AlGaAs/GaAs heterojunction bipolar transistor,” April 1994
- MS Thesis, Abhijit Phanse, “BiCMOS switching analysis,” April 1994
- MS Thesis, Cheng-Hao Huang, “Study on scanning delivery system for holmium YAG laser thermalkeratoplasty,” August 1993
- MS Thesis, Hoanh Pham, “BiCMOS analysis including high injection and base pushout effect,” August 1993
- Undergraduate Honor Thesis, Jason Steighner, “Analysis and enhancement of the LDMOSFET for safe operating area and device ruggedness,” May 2010; Outstanding Honor Thesis (1<sup>st</sup> prize), UCF, 2011
- Undergraduate Honor Thesis, Wade Randall Smith, “A study of the changes in electromagnetic radiation from a microprocessor due to differences in programs and clock cycles,” May 2001
- Undergraduate Honor Thesis, Kelley Davis, “Substrate noise modeling in a complex mixed-signal circuit,” August 1998
- Undergraduate Honor Thesis, Anthony Klee, “Noise analysis for analog amplifiers,” December 1993
- Undergraduate Honor Thesis, Brian Smith, “Theoretical analysis of avalanche breakdown in heterojunction light amplifying optical switches,” August 1993

## **Research Grants**

- Planning Grant: I/UCRC for Multi-functional Integrated System Technology, NSF, Principal Investigator, \$11,500, 7/13-6/14
- High linearity RF power amplifier design, simulation, and characterization, Jiangxi Xinyu Huatong Machinery Co., Ltd, \$30,000, 7/11-8/13
- Yuan’s Nanoelectronics Reliability lab, Dr. Ma’s donation, \$20,000, 7/10-4/14
- Design and analysis of high energy efficient dc-dc converters for small satellites, Florida Space Grant Consortium, Principal Investigator, \$25,000, 8/08-8/09
- International planning visits to develop for research and education partnerships in SiGe power devices and dc-dc converters, NSF, Principal Investigator, \$15,180, 10/08-9/10
- Yuan’s research, Dynetix Design Solutions, Principal Investigator, \$15,000, 8/06-7/09
- Rapid Prototyping and Packaging of Microsystems for Interdisciplinary Research, Presidential Initiative, UCF, Co-PI, \$180,000, 1/06-6/06
- Modeling of Semiconductor Devices for Circuit Simulation and Design, Empirion, Principal Investigator, \$8,750, 3/05-5/05

- Development of Designing-in-Reliability Tools for Next Generation ULSI Designs, Principal Investigator, Lucent Technologies, \$795,102, 7/99-6/05
- Three-Axis Gyroscope for Space Applications, Co-Principal Investigator, UCF-UF Space Research Initiative, \$170,000, 11/02-6/03
- Development of VLSI design laboratory for integrated research and education, Presidential Initiative, UCF, Principal Investigator, \$65,000, 2/02–6/02
- Self-timed digital circuits using NULL convention logic, Theseus Logic and I-4 Phase VI matching funding, Principal Investigator, \$150,000, 7/02-6/03
- Delay-insensitive chip design using NCL, Theseus Logic and I-4 Phase IV matching funds, Principal Investigator, \$195,000, 1/01-12/01
- IC Failure Analysis, Lucent Technologies, Principle Investigator, \$548,601, 6/00-8/00
- Application-Specific Chip Design using Asynchronous Digital Methodologies, Theseus Logic and I-4 Corridor phase-II matching funds, Principal Investigator, \$330,000, 8/99-12/00
- Interdisciplinary research in Computer Architecture, ASIC, and Microelectronics Testing and Characterization, Presidential Initiative, UCF, Principle Investigator, \$115,862, 1/00-12/00
- Adaptive Reed-Solomon Decoder Design for Wireless Communications, RSI Baseband Technologies, Principle Investigator, \$60,000, 1/00-12/00
- Research Experience for Undergraduates in Process Automation and Device/Circuit Designs for Semiconductor Manufacturing, NSF, Co-PI, \$301,494, 2/99-1/01
- A Satellite Based ATM Network, RSI Baseband Technologies and Florida Space Grant Consortium, Principal Investigator, \$20,000, 5/99-8/00
- Hardware Description Language for System Design, Florida Space Grant Consortium, Principal Investigator, \$8,000, 5/99-8/99
- Microelectronics Design Center at the University of Central Florida, Co-PI, Presidential Initiative, UCF, \$145,465, 1/99-12/99
- An Electrical Motion Platform, Co-PI, Presidential Initiative, UCF, \$52,000, 1/99-12/99
- Development of an MEMS-Based Motion Testing, Co-PI, USDC, \$105,674, 1/99-12/99
- ECE and Harris Partnership in Microelectronics, Principal Investigator, State of Florida and Harris Corporation, \$250,000 (my share was \$70,000), 7/98-6/99
- CAD/CAE Training Center, Principal Investigator, Enterprise Florida, \$100,000, 1/98-12/98
- Application of Mentor Graphics CAD Software at the University of Central Florida, Principal Investigator, Mentor Graphics Corporation, software donation, 4/98
- Modeling of Substrate Noise in Mixed-Signal ICs, Principal Investigator, Harris Semiconductor, \$27,700, 1/98-12/99
- A Study in Low Cost, High Performance SiGe BiCMOS Technology for Wireless Communication Systems, Principal Investigator, Lucent Technologies, \$38,179, 8/97-7/98
- Low Power ICs in Space Applications, Principal Investigator, Florida Space Grant Consortium, \$10,000 total (\$4,000, 5/97-7/97 and \$6,000 8/97-4/98)
- Radiation Effects on CMOS Devices in Space Applications, Principal Investigator, Florida Space Grant Consortium, \$10,000 total (\$4,000, 5/96-7/96 and \$6,000, 8/96-4/97)
- Enhancement of Undergraduate Electrical Engineering Program: Option of Power Engineering, Co-Principal Investigator, AISP, University of Central Florida, \$25,000, 7/96-6/97
- Research in GaAs Device and Circuit Modeling, Principal Investigator, Engineering Faculty Internship Award, National Science Foundation, \$40,000, 2/94-1/95



- Semiconductor Device Modeling and Simulation, Principal Investigator, REU Supplement, National Science Foundation, \$10,000, 1/95-8/95
- BiCMOS Technology Transfer and Scalable Bipolar Transistor Model Development, Principal Investigator, National Semiconductor Corporation, \$20,652, 12/93-12/94
- Software Donation of MEDICI 1.1, HD-AAM, LT-AAM for the Heterojunction Transistor Research at UCF, Principal Investigator, Technology Modeling Associates, \$30,600
- Radiation Effects on Photoconductor and Photodiode in Space, Principal Investigator, Undergraduate Student Participation Program, Florida Space Grant Consortium, \$5,000, 5/93-4/94
- BiCMOS Technology Characterization, Simulation, and Modeling, Principal Investigator, National Semiconductor Corporation, \$16,020, 9/92-12/93
- Software and Hardware Development for Medical Laser Applications, Principal Investigator, Laser Sight Inc., \$10,134, 9/92-5/94
- Modeling of Si/Si<sub>1-x</sub>Ge<sub>x</sub> Heterojunction Bipolar Transistors, Principal Investigator, Division of Sponsored Research, UCF, \$5,000, 5/92-5-93
- Heterostructure Transistor Modeling and Circuit Application in RF Communication, Principal Investigator Motorola, \$24,863, 12/91-12/92
- Modeling of Homojunction and Heterojunction Bipolar Transistors, Principal Investigator, Motorola, \$18,786, 5/91-8/91
- Fiber-Optic Temperature Sensing System Design using Cr:LiSAF Crystal, Principal Investigator, CREOL, UCF, \$11,000, 1/92-5/92
- Design and Modeling of Heterojunction Bipolar Transistors including High Current Effects and Temperature Dependence, Principal Investigator, Division of Sponsored Research, UCF, \$10,000, 5/91-5/92

## **Publications**

Summary: 2 textbooks, 1 book chapter, 149 journal papers, and 126 conference papers

### *Books and Book Chapters:*

1. J. S. Yuan and J. J. Liou, *Semiconductor Device Physics and Simulation*, Plenum, 1998, 336 pages
2. J. S. Yuan, *SiGe, GaAs, and InP Heterojunction Bipolar Transistors*, Wiley Interscience, 1999, 463 pages
3. *Handbook of RF/Microwave Components*, book chapter: heterojunction bipolar transistors and applications, 1784 pages, Wiley Interscience, 2003

### *Referred Journals:*

1. J. S. Yuan, J. J. Liou, and W. R. Eisenstadt, "A physics-based current-dependent base resistance model for advanced bipolar transistors," *IEEE Trans. Electron Devices*, vol. ED-35, pp. 1055-1062, July 1988
2. J. J. Liou and J. S. Yuan, "A two-dimensional model for emitter-base junction capacitance of bipolar transistors," *Solid-State Electron.*, vol. 31, pp. 1541-1549, October 1988

3. J. S. Yuan and W. R. Eisenstadt, "S-parameter measurement prediction for bipolar transistors using a physical device simulator," *IEEE Trans. Electron Devices*, vol. 35, pp. 1633-1639, October 1988
4. J. S. Yuan and W. R. Eisenstadt, "Circuit modeling of collector current spreading effects in quasi-saturation for advanced bipolar transistors," *Solid-State Electron.*, vol. 31, pp. 1725-1731, December 1988
5. J. J. Liou, A. Whittaker, and J. S. Yuan, "Modeling the two-dimensional emitter-base and base-collector junction capacitances of bipolar junction transistors," *Phys. Stat. Sol.*, vol. 113, pp. 267-271, June 1989
6. J. S. Yuan and J. J. Liou, "Circuit modeling of transient emitter crowding and dynamic resistance effects for advanced bipolar transistors," *Solid-State Electron.*, vol. 32, pp. 623-631, August 1989
7. J. J. Liou and J. S. Yuan, "A physics-based bipolar transistor model for low-temperature circuit simulation," *J. Appl. Phys.*, vol. 66(9), pp. 4474-4480, November 1989
8. J. J. Liou and J. S. Yuan, "An avalanche multiplication model for bipolar transistors," *Solid-St. Electron.*, vol. 33, pp. 35-37, January 1990
9. J. J. Liou and J. S. Yuan, "Compact bipolar transistor model for circuit simulation," *Int. J. Electron.*, vol. 68, pp. 265-273, February 1990
10. J. S. Yuan, W. R. Eisenstadt, and J. J. Liou, "A novel lossy and dispersive interconnect model for integrated circuit simulation," *IEEE Trans. Components, Hybrids, and Manufac. Tech.*, vol. 13, pp. 275-280, June 1990
11. J. J. Liou, W. W. Wang, and J. S. Yuan, "A study of base built-in field effects on the steady-state current gain of heterojunction bipolar transistors," *Solid-St. Electron.*, vol. 33, pp. 845-849, July 1990
12. J. S. Yuan and J. J. Liou, "An improved latching pulse design for dynamic sense amplifiers," *IEEE J. Solid-State Circuits*, vol. SC-25, pp. 1294-1299, October 1990
13. J. J. Liou and J. S. Yuan, "Modeling the reverse base current phenomenon due to avalanche effect in advanced bipolar transistors," *IEEE Trans. Electron Devices*, vol. 37, pp. 2274-2276, October 1990
14. J. J. Liou, J. S. Yuan, and W. W. Wong, "Effects of using the more accurate intrinsic concentration on bipolar transistor modeling," *J. Appl. Phys.*, vol. 68(11), pp. 1911-1912, December 1990
15. J. J. Liou, K. Lee, S. M. Knapp, K. B. Sundaram, J. S. Yuan, D. C. Malocha, M. Belkerdid, "A non-quasi-static small-signal model for metal-semiconductor junction diode," *Solid-State Electron.*, vol. 33, pp. 1629-1632, December 1990
16. J. S. Yuan and J. J. Liou, "An improved Early voltage model for advanced bipolar transistors," *IEEE Trans. Electron Devices*, vol. ED-38, pp. 179-182, January 1991
17. J. J. Liou and J. S. Yuan, "Physics-based large-signal heterojunction bipolar transistor model for circuit simulation," *IEE Proceedings*, Part G, vol. 138, pp. 97-103, February 1991
18. J. S. Yuan, W. R. Eisenstadt, and J. J. Liou, "Modeling of coupled interconnect Lines for integrated circuits," *Int. J. Electron.*, vol. 70, pp. 751-764, April 1991
19. J. S. Yuan and J. J. Liou, "Modeling of temperature-dependent avalanche currents in advanced bipolar transistors," *Solid-State Electron.*, vol. 34, pp. 533-534, May 1991
20. J. S. Yuan, "Two-dimensional lateral bipolar transistor model for circuit simulation," *Int. J. Electron.*, vol. 70, pp. 1041-1048, June 1991

21. J. S. Yuan, C. S. Yeh, and B. Gadepally, "Temperature and impact ionization effects on  $f_T$  of advanced bipolar transistors," *J. Appl. Phys.*, vol. 70(4), pp. 2402-2407, August 1991
22. J. S. Yuan, "Modeling the current-dependent  $f_T$  for AlGaAs/GaAs heterojunction bipolar transistor design," *Solid-State Electron.*, vol. 34, pp. 1103-1107, October 1991
23. J. S. Yuan, "Optimal CMOS interconnect width design in electromigration free," *Int. J. Electron.*, vol. 71, pp. 771-779, November 1991
24. J. S. Yuan, "High performance P-n-p heterojunction bipolar transistor design," *Solid-St. Electron.*, vol. 34, pp. 1347-1352, December 1991
25. J. S. Yuan, C. S. Yeh, and B. Gadepally, "Effects of using minority hole mobility in  $n^+$  emitter on bipolar transistor modeling," *Solid-State Electron.*, vol. 34, pp. 1460-1462, December 1991
26. J. S. Yuan, "Delay analysis of BiNMOS driver including high current transients," *IEEE Trans. Electron Devices*, vol. ED-39, pp. 587-592, March 1992
27. J. J. Liou, J. S. Yuan, and S. Hooman, "Modeling of the bipolar transistors subjected to neutron irradiation for circuit simulation," *IEEE Trans. Electron Devices*, vol. 39, pp. 593-597, March 1992
28. J. S. Yuan and J. J. Liou, "Improved bipolar model equations for small-signal circuit simulation," *Int. J. Electron.*, vol. 72, pp. 619-630, May 1992
29. J. J. Liou and J. S. Yuan, "Surface recombination current of AlGaAs/GaAs Heterojunction bipolar transistors," *Solid-State Electron.*, vol. 35, pp. 805-813, June 1992
30. J. J. Liou and J. S. Yuan, "Optically driven photoconductive devices for power switching application, Part II: thermal modeling including heat sink," *IEE Proceedings*, Part G, vol. 139, pp. 350-355, June 1992
31. J. S. Yuan, "Modeling of Si/Si<sub>1-x</sub>Ge<sub>x</sub> heterojunction bipolar transistors," *Solid-State Electron.*, vol. 35, pp. 921-926, July 1992
32. J. S. Yuan, "Collector-base junction capacitance of advanced bipolar transistors operating at avalanche breakdown," *Physica Status Solidi*, vol. 134, pp. 575-581, December 1992
33. J. S. Yuan, "Modeling of GaAs MESFET output conductance and transconductance frequency dispersion," *Int. J. Electron.*, vol. 74, pp. 51-58, January 1993
34. J. S. Yuan, "Testing the impact of process defects on ECL power-delay performance," *Int. J. Electron.*, vol. 74, pp. 201-207, February 1993
35. J. S. Yuan and J. J. Liou, "Array noise analysis for megabit DRAM's," *Int. J. Electron.*, vol. 74, pp. 265-279, February 1993
36. J. S. Yuan, "Base pushout effect on collector signal delay and Early voltage for heterojunction bipolar transistors," *Solid-State Electron.*, vol. 36, pp. 657-660, April 1993
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53. X. Duan, W. Wu, and J. S. Yuan, "Hole detrapping effect on gate oxide breakdown under ac and dc stresses", *International Integrated Reliability Workshop*, Stanford Sierra Camp, Lake Tahoe, California, October 23-26, 2000

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64. E. Xiao and J. S. Yuan, "Effects of hot carrier stress and oxide soft breakdown on VCO performance," *IEEE Radio Frequency Integrated Circuits (RFIC) Symposium*, Seattle, Washington, June 2-4, 2002
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85. L. Yang and J. S. Yuan, "Design of enhancement current-balanced logic for mixed-signal ICs," *IEEE International Symposium on Circuits and Systems*, Bangkok, Thailand, May 25-28, 2003

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92. A. Sadat, Y. Liu, J. S. Yuan, and H. Xie, "Soft breakdown effects on MOS switch and passive mixer," *International Reliability Physics Symposium*, Phoenix, AZ, April 25-29, 2004
93. J. S. Yuan, "Education on CMOS RF device and circuit reliability," *American Association of Engineering Education - Southeast Section Annual Conference*, Auburn Alabama, April 4-6, 2004
94. H. Qu, D. Fang, A. Sadat, J. S. Yuan, and H. Xie, "High-resolution integrated micro-gyroscope for space applications," *41<sup>st</sup> Space Congress*, Cape Canaveral, Florida, April 27-30, 2004
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98. C. Yu and J. S. Yuan, "RF reliability of MOSFETs subject to electrical stress," *7<sup>th</sup> International Conference on Solid-State and Integrated-Circuit Technology*, Beijing, China, October 18-21, 2004
99. J. S. Yuan, "RF CMOS device and circuit reliability subject to electrical and temperature stress," *Microelectronic Reliability & Qualification Workshop*, Manhattan Beach, CA, December 7-8, 2004
100. C. Yu and J. S. Yuan, "Evaluation of performance degradation in RFICs due to voltage stress," *The Graduate Research Forum*, University of Central Florida, Orlando, Florida, March 22, 2005
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105. J. Di and J. S. Yuan, "Dynamic active-bit detection and operands exchange for designing energy-aware asynchronous multipliers," *2005 International Multiconference in Computer Science & Computer Engineering*, Las Vegas, Nevada, June 27-30, 2005
106. C. Yu, E. Xiao, and J. S. Yuan, "Voltage stress-induced hot carrier effect on SiGe HBT VCO," *European Symposium on Reliability of Electron Devices*, Bordeaux, France, October 11-14, 2005
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110. C. Yu, L. Jiang, and J. S. Yuan, "Study of performance degradations in DC-DC converter due to hot carrier stress by simulation," *European Symposium on Reliability of Electron Devices*, Wuppertal, Germany, October 3-6, 2006
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112. L. Jiang and J. S. Yuan, "Dynamic stress effect on LDMOS RF performances," *IEEE Power Electronics Specialists Conference*, Orlando, Florida, June 17-21, 2007
113. J. S. Yuan, invited paper, "HfO<sub>2</sub> CMOS device and circuit reliability," *IEEE International Conference on Electron Devices and Solid-State Circuits*, Tainan, Taiwan, December 20-22, 2007
114. X. Liu, J. S. Yuan, and J. J. Liou, "InGaP/GaAs heterojunction bipolar transistor and RF power amplifier reliability," *European Symposium on Reliability of Electron Devices*, Maastricht, Netherlands, September 29-October 2, 2008
115. J. S. Yuan and J. Ma, Invited paper, "Gate oxide breakdown location effect on power amplifier and mixed-signal circuits," *9<sup>th</sup> International Conference on Solid-State and Integrated-Circuit Technology*, Beijing, China, October 20-23, 2008
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119. B. Yang, J. S. Yuan, Z. Shen, "Reliability and failure mechanisms of lateral MOSFETs in synchronous DC-DC buck converter," *16<sup>th</sup> IEEE International Symposium on the Physical and Failure Analysis of Integrated Circuits*, Suzhou, China, July 6-10, 2009
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123. G. V. Ramos and J. S. Yuan, "Development of a novel wireless electric power transfer system for space applications," *15<sup>th</sup> World Multiconference on Systemics, Cybernetics, and Informatics*, Orlando, Florida, July 19<sup>th</sup> - 22<sup>nd</sup>, 2011
124. Y. Wang and J. S. Yuan, "An integrated CMOS high power amplifier using power combining technique," *IEEE Southeastcon*, Orlando, Florida, March 15-18, 2012
125. G. R. Varquez and J. S. Yuan, "FEM simulation to characterize wireless electric power transfer elements," *IEEE Southeastcon*, Orlando, Florida, March 15-18, 2012
126. G. R. Varquez and J. S. Yuan, "Radiated emissions testing of space wireless electric power transfer systems," *IEEE Southeastcon*, Orlando, Florida, March 15-18, 2012

## Affiliations

Eta Kappa Nu, Tau Beta Pi, and IEEE

## Professional Services

- Editor, *IEEE Transactions on Device and Materials Reliability*, 2000-present
- Distinguished Lecturer, IEEE Electron Devices Society, 2006-present
- Panelist, Texas Higher Education Coordinating Board, 2008
- Session Chair, IEEE International Conference on Electron Devices and Solid-State Circuits, Tainan, Taiwan, December 20-22, 2007
- Judge of the 50th State Science and Engineering Fair, Orlando, FL, April 6-8, 2005
- Associate Editor, *International Journal of Modeling and Simulation*, 8/98-12/02
- Member of Technical Committee, International Association of Science and Technology for Development (IASTED), 9/00-present
- Reviewer for the *IEEE Transactions on Electron Devices*, *IEEE Transactions on Circuits and Systems*, *IEEE Electron Device Letters*, *Solid-State Electronics*, *Microelectronics Journal*, *International Journal of Electronics*, *Microelectronics Reliability*, and NSF

- Session Chair, 8<sup>th</sup> World Multi-Conference on Systemics, Cybernetics and Informatics, Orlando, Florida, July 18-21, 2004
- Session Chair, 11<sup>th</sup> IEEE International Symposium on Electron Devices for Microwave and Optoelectronic Applications, Orlando, Florida, November 17-18, 2003
- Chair, Electron Devices Chapter, IEEE Orlando Section, 1998-2002
- Exhibits Chair, International Symposium on Circuits and Systems, Orlando, Florida, May 31-June 1, 1999
- Technical Program Co-Chair, IEEE Southeastcon, Orlando, FL, April 1998
- Technical Committee member, 2nd International Conference on Devices, Circuits, and Systems, Margarita Island, Caracas, Venezuela, Feb. 1998
- Technical Committee member, IEEE Southeastcon, Tampa, FL, April 1996
- Technical Committee member, IEEE Southcon, Orlando, FL, June 1996
- Session Organizer, IEEE Southcon, Orlando, FL, June 1996
- Faculty Advisor, Eta-Kappa-Nu, 1995-1996
- Regional Coordinator, Chinese American Scholars Association of Florida, 1995-1996
- Session Chair, 1st International Caracas Conference on Devices, Circuits, and Systems, Caracas, Venezuela, Dec. 1995
- Session Organizer, IEEE Westcon, San Francisco, CA, Nov. 1995
- Secretary, Chinese American Scholars Association of Florida, 1994-1995
- Technical Committee member of the 1994 IEEE Southcon Conference, Orlando, FL, Apr. 1994
- Session Chair of the 1994 IEEE Southcon Conference, Orlando, FL, Apr. 1994
- Judge of the 38th State Science and Engineering Fair, Orlando, FL, Apr. 14-16, 1993
- Session Organizer of the 23rd Annual Pittsburgh Conference on Modeling and Simulation, Pittsburgh, PA, April 30 - May 1, 1992
- Session Chair of the 23rd Annual Pittsburgh Conference on Modeling and Simulation, Pittsburgh, PA, April 30 - May 1, 1992
- Session Chair of the 1992 IEEE Southeast Conference, Birmingham, AL, Apr. 12-15, 1992
- Session Chair of the 22nd Annual Pittsburgh Conference on Modeling and Simulation, Pittsburgh, PA, May 2-3, 1991
- Judge of the 42nd International Science and Engineering Fair, Orlando, FL, May 5-8, 1991

### **Committee Services**

- Chair, TIP Criteria Committee, College of Engineering and Computer Science, 2012-2013
- Awards Committee, College of Engineering and Computer Science, 2012-2014
- TIP Selection Committee, College of Engineering and Computer Science, 2011-2012
- Research Committee, College of Engineering and Computer Science, 2011-2012
- Space and Safety Committee, College of Engineering and Computer Science, 2010-2012
- Promotion and Tenure Committee, College of Engineering and Computer Science, 2008-2010
- ECE Advisory Committee, Department of EECS, ECE Division, 2010-present
- Chair, Promotion and Tenure Committee, Department of Electrical Engineering and Computer Science, 2012-present; member (2005-2012)
- Faculty Search Committee, ECE Department of EECS, ECE Division, 2011-2012
- Lecturer Search Committee, ECE Department of EECS, ECE Division, 2011-2012, 2012-2013

- Graduate Committee, Department of EECS, ECE Division, 2010-present
- Technical Area Committee Chair, Device Electronics, ECE Department of EECS, ECE Division, 2011
- Faculty Judge, Showcase of Undergraduate Research Excellence, UCF, 2010
- EE Curriculum Oversight and Review Committee, EE program, EECS, 2008
- TIP Selection Committee, CECS, 2004-2005
- Senator, Faculty Senate (University), 2003-2005
- Personnel Committee, Faculty Senate, 2003-2005
- Engineering III Building Committee, ECE Dept. 2004-2005
- Awards and Scholarships Committee, College of Engineering and Computer Science, 2003-2005
- Faculty Search Committee, ECE, 2003-2004, Committee Chair
- Research Committee, College of Engineering and Computer Science, 2003-2004
- Promotion and Tenure Committee, EE, SEECS, 2003
- Faculty Search Committee, EE, SEECS, 2002-2003
- Electronics Subcommittee (Electrical and Computer Engineering Dept.), 1994-present
- Graduate Affairs Committee (Electrical and Computer Engineering Dept.), 1992-1993, 2001-2002
- ABET Coordinator, ECE Programs, SEECS, 2001-2002
- Faculty Senate (University), 1999-2001, Alternative
- Personnel Committee (Electrical and Computer Engineering Dept.), 1998-1999
- Microelectronics Faculty Search Committee (Electrical and Computer Engineering Dept.), 1998-1999
- External Relation Committee (College of Engineering), 1995-1999
- Named Professor Selection Committee (College of Engineering), 1997-1998
- Chair of Lab and Space Committee (Electrical and Computer Engineering Dept.), 1997-1998
- Mater of Ceremonies, Birthday Party (Electrical and Computer Engineering Dept.), 1996-1997
- Joint VLSI/Architecture Committee (Electrical and Computer Engineering Dept. and Computer Science Dept.), 1995-1996
- Industrial Advisory Committee (Electrical and Computer Engineering Dept.), 1995-1996
- Academic Initiative Strategic Program Committee (University), 1995
- Library Representative (College of Engineering), 1994-1995
- Undergraduate Affairs Committee (Electrical and Computer Engineering Dept.), 1993-1995
- Computer Usage Committee (Electrical and Computer Engineering Dept.), 1994-1995
- Microelectronics Subcommittee (Electrical and Computer Engineering Dept.), 1990-1994
- ECE Chair Search Committee (Electrical and Computer Engineering Dept.), 1994
- Honor in Major Committee (College of Engineering), 1992-1993
- Minority Program Committee (College of Engineering), 1991-1992