BIOGRAPHY OF JUIN J. LIOU

I. Summary of Personal Background and Professional Contributions

OFFICE ADDRESS:

678 Andover Circle, Winter Springs, Florida 32708, USA; Phone: (407)761-3102; Fax: (407)365-1650; Email: juin.liou@hotmail.com

AREA OF INTEREST:

Micro/nanoelectronics reliability, including design, modeling, simulation, and characterization of issues related to electromagnetic compatibility (EMC) and electrostatic discharge (ESD).

EDUCATION:

B.S., 1982, University of Florida in Electrical Engineering (with honors)
M.S., 1983, University of Florida in Electrical Engineering
Ph.D., 1987, University of Florida in Electrical Engineering

EXPERIENCE:

2017-present:	Chair Professor and Director, College of Electronics and Information Engineering, Zhengzhou University, China
2017-present:	President, Emoat Corp., LLC, USA
2013-2017	Director of Research Program, College of Engineering and Computer Science, University of Central Florida, USA
2013-2017	Lockheed Martin St. Laurent Professor of Engineering, University of Central Florida, USA
2009-2017	Pegasus Distinguished Professor and Analog Devices Fellow, University of Central Florida, USA
2002-2004:	Associate Dean for Graduate Studies, College of Engineering and Computer Science, University of Central Florida, USA
1997-2009:	Professor, Electrical and Computer Engineering Department, University of Central Florida, USA
1994-2017:	Director, Solid-State Electronics Lab and Device Characterization Lab, University of Central Florida, USA
1994-1999:	Graduate Program Coordinator and Resource Development Officer, Electrical & Computer Engineering Dept., University of Central Florida, USA
1991-1997:	Associate Professor, University of Central Florida, USA
19871991:	Assistant Professor, University of Central Florida, USA
19851986:	Instructor, University of Florida, USA
19821986:	Research Assistant, University of Florida, USA

19771979:   Product Engineer, Tatung Company, Taipei, Taiwan, R.O.C.

<u>PROFESSIONAL ACTIVITY</u>:

Fellow of the IEEE; Fellow of the IET; Fellow of the AAIA; Member of the New York Academy of Sciences; Member of National Academy of Inventors.
Regional Editor (in USA, Canada and South America), *Microelectronics Reliability*.
Associate Editor, *Simulation Journal* (VLSI and Circuit Simulation area).
IEEE Electron Devices Society Representative, IEEE Trans. Devices and Material Reliability (2016-present).
Guest Editor, *Microelectronics Reliability* Special Issue, "Reliability of Compound Devices and ICs", vol. 35, issue 3, 1996.
Guest Editor, *Microelectronics Reliability* Special Issue, "2009 International Electron Devices and Materials Symposium", vol. 50, issue 5, 2010.
Guest Editor, *Solid-State Electronics* Special Issue, "2011 International Nano-Electronics Conference", vol. 55, issue 12, 2011.
Guest Editor, *International Journal of Antennas and Propagation* Special Issue, "Modern Phased Arrays and its Hybrid Intelligent Processing", vol. 22, issue 11, 2013.
Guest Editor, *Microelectronics Reliability* Special Issue, "2014 International Electron Devices and Materials Symposium", vol. 54, issue 11, 2014.
Guest Editor, *IEEE Journal on Emerging and Selected Topics in Circuits and Systems* Special Issue, "Green Computational Trends for Security Systems", 2015.
Guest Editor, *Scientific World Journal* Special Issue, "Solution-Based Process on Electron Devices", 2015.
Guest Editor, *Microelectronic Reliability* Special Issue, "Reliability of Next-Generation Electronics," 2018.
Editorial Advisory Board, *International Journal of Electron Devices and Materials*
Editorial Advisory Board, *Advances in Microelectronic Engineering*
Editorial Advisory Board, *Journal of Semiconductors*
Editorial Advisory Board, *Microelectronics and Reliability*
IEEE Electron Device Society (EDS) Vice President
IEEE EDS Treasurer
IEEE EDS Finance Committee Chair
Member of IEEE Fellow Committee
Member of IEEE EDS Board of Governors; Member of IEEE Educational Activities Committee; Member of IEEE EDS Chapter/Region Committee; Member of IEEE EDS Ex-Officio AdCom; Member of IEEE Sensors Council Fellow Evaluation Committee
Chapter Partner of IEEE EDS Mexico Chapter, Venezuela Chapter, Mid-Hudson Chapter, Atlanta Chapter, and Vancouver Chapter
Honorary General Chair, IEEE International Conference on Next-Generation Electronics (2014)
Honorary General Chair, IEEE International Conference on Electron Devices and Solid-State Circuits (2013, 2016, 2017)
General Chair, IEEE International NanoElectronic Conference (2016)
General Chair, IEEE International Conference on Reliability, Maintainability, and Safety (2014)

General Chair, International Symposium on Physical Failure and Analysis of Integrated Circuits (2013, 2017, 2019)

General Chair, International Conference on Systems, Circuits and Devices (2020)

General Chair, IEEE International Conference on Electron Devices and Solid-State Circuits (2007, 2008, 2009, 2011, 2012, 2019)

General Chair, International Electron Device and Material Symposium (2009)

General Chair, International Workshop on Electrostatic Discharge Protection (2009)

General Chair, IEEE International Symposium on Next-Generation Electronics (2006, 2008, 2010, 2016, 2017, 2019, 2020)

General Chair, IEEE International Caribbean Conference on Devices, Circuits, and Systems (2008)

General Chair, IEEE/ECS ULSI Process Integration Symposium (2007)

General Chair, IEEE International Symposium on Electron Devices for Microwave and Optoelectronic Applications (2003)

General Chair, IEEE International Caracas Conference on Devices, Circuits, and Systems (2002).

Technical Program Chair, IEEE Workshop on Frontier Electronics (2007)

Technical Program Chair, IEEE International NanoElectronics Conference (2011)

International Advisory Committee Chair, International Symposium on Physical Failure and Analysis of Integrated Circuits (2009)

International Advisory Committee Chair, IEEE International Conference on Electron Devices and Solid-State Circuits (2005)

Local Program Chair, IEEE Workshop on Frontier Electronics (2004)

International Advisory Chair, IEEE International Caracas Conference on Devices, Circuits, and Systems (2004, 1997, 1995).

Technical Program Co-Chair, International Conference of Solid-State and Integrated Circuit Technology (2004, 2006, 2008, 2010, 2012, 2014)

Technical Program Chair, IEEE Hong Kong Electron Device Meeting (1998, 1999), IEEE International Reliability Physics Symposium (1997-2000), and IEEE International Caracas Conference on Devices, Circuits, and Systems (2000).

Registration Committee Chair, IEEE International Symposium on Circuits and Systems (1999).

Member of Steering Committee: IEEE International Conference on Microelectronics, IEEE International Symposium on Circuits and Systems, and IEEE Conference on Electron Devices and Solid-State Circuits.

Member of Technical Program Committee: International Symposium on Microelectronics, IEEE Southcon, IEEE Southeastcon, IEEE International Symposium on High Performance Devices, and IEEE Test Technology Technical Committee.

Consultant for OGDEN/ERC Government Systems, Wright Laboratory (Air Force), Sharp Corporation, and Superior Medical Technologies, Inc.

Reviewer for the following technical journals: Journal of Applied Physics, Applied Physics Letters, IEEE Trans. on Electron Devices, IEEE Electron Device Letters, IEEE Journal of Solid-State Circuits, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, IEEE Transactions on Circuits and Systems, IEEE Transactions on Neural Networks, IEEE Transactions on VLSI Systems, IEEE Transactions on Microwave Theory and Techniques, IEE Proceedings, Solid-State Electronics, Solar Energy Materials and Solar Cells, International

Journal of Electronics, International Journal of Modeling and Simulation, International Journal of Microcircuits and Electronic Packaging, and Microelectronics Journal.

Session Organizer/Chairman, "Compound Semiconductor Devices," IEEE Hong Kong Electron Device Meeting, Hong Kong (1996, 1997, 1998, 1999).

Session Organizer/Chairman, "Solid State Electronics," IEEE Southcon, Orlando, FL (1994, 1996).

Session Organizer/Chairman, "Device Modeling and Circuit Simulation," Modeling and Simulation Conference, Pittsburgh, PA (1991, 1992).

Session Organizer/Chairman, "Science and Technology," Annual Conference of Chinese-American Scholar Association of Florida, Miami, FL (1992).

Session Organizer/Chairman, "Modeling and Simulation of HBT," IEEE International Symposium on High Performance Devices, Leeds, UK (1996, 1997, 1999).

Secretary, Chinese-American Scholar Association of Florida (1991-1992).

Vice-President, Chinese-American Association of Central Florida (1994).

President, Chinese-American Association of Central Florida (1995).

Vice-President, Chinese-American Scholar Association of Florida (1999-2000).

Visiting Senior Fellow, Electrical Engineering Dept., National University of Singapore, Singapore, June 1997 to Dec. 1997.

Conducted an invited 3-day tutorial "Advanced Semiconductor Device Physics and Modeling," Singapore, Aug. 1995.

Conducted an invited 2-day tutorial "MOSFET Device Physics, Simulation, and Parameter Extraction," Singapore, Jan. 1997.

Conducted an invited 2-week short course, "Advanced Semiconductor Device Physics and Modeling," Wuhan, China, May 2001.

Conducted an invited 4-day short course, "Modern RF Transistors: Design, Modeling, and Applications," Taipei, Taiwan, Oct. 2003.

Conducted an invited 2-day short course, "Design and Modeling of Electrostatic Discharge Protection for Microchips," Shanghai, China, June 2006.

Conducted an invited tutorial, "Recent advances and compact modeling of RF CMOS," 2004 Nanotechnology Conference, Boston, MA, March 2004.

Conducted an invited tutorial, "Electrostatic discharge protection for microchips," International Symposium on Physical Failure and Analysis, Hsinchu, Taiwan, July 2004.

Conducted an invited tutorial, "Design and Modeling of Electrostatic Discharge Protection for Microchips," International Conference of Solid-State and Integrated Circuit Technology, Shanghai, China, Oct. 2006.

HONORS AND AWARDS:

Fellows Grades at Professional Organizations
Fellow of Institute of Electrical and Electronic Engineers (IEEE) (Citation: For contributions to development of electrostatic discharge protection of integrated circuits)
Fellow of Institute of Engineering and Technology (IET) (Citation: For sustained and outstanding contributions to electron device research and education)
Fellow of Asia-Pacific Artificial Intelligence Association (AAIA) (Citation: For outstanding

contributions to the improvement of reliability of AI integrated Circuits)
Fellow of Singapore Institute of Manufacturing Technology

Awards from University of Central Florida

Lockheed Martin St. Laurent Professor of Engineering, University of Central Florida (2013)
Pegasus Distinguished Professor, University of Central Florida (2000)
Fellow of UCF-Analog Devices, University of Central Florida (2000)
College Research Professorship Award, University of Central Florida (2013)
Distinguished Faculty of the Year, University of Central Florida (2009)
Distinguished Researcher Award, University of Central Florida (four times: 1992, 1998, 2002, and 2009).
Research Incentive Award, University of Central Florida (four times: 2000, 2005, 2010, 2015).
Teaching Incentive Award, University of Central Florida (1995).
Senior Department Research Award, University of Central Florida (1993).
Senior College Research Award, University of Central Florida (1993).
Outstanding Faculty Award, Student Engineering Council, University of Central Florida (1993).

Honorary Conference Chairs/Professorships

Honorary General Chair, IEEE International Symposium on Next-Generation Electronics (2014, 2022)
Honorary General Chair, IEEE International Conference on Electron Devices and Solid State Circuits (2013, 2016, 2017)
Chang Jiang Scholar Endowed Professor, Ministry of Education, China
1000 Talented Expert, Ministry of Organization, China
Renowned Overseas Scholar, Ministry of Education, China
Chunhui Eminent Scholar, Peking University, China
NSVL Distinguished Professor, National Semiconductor Corp., USA
Chang Gung Endowed Professor, Chang Gung University, Taiwan
Honorary Endowed Professor, National Taiwan University of Science and Technology, Taiwan
International Honorary Chair Professor, National Taipei University of Technology, Taiwan
Feng Chia Chair Professor, Feng Chia University, Taiwan
Cao Guang-Biao Endowed Professor, Zhejiang University, Hangzhou, China
Honorary Professor, Xidian University, Xian, China
Consultant Professor, Huazhong University of Science and Technology, Wuhan, China
Courtesy Professor, Shanghai Jiao Tong University, Shanghai, China
Courtesy Professor, South China University of Technology, Guangzhou, China

Awards from the IEEE

IEEE Electron Devices Society Education Award, 2014 (Citation: For promoting and inspiring global education and learning in the field of electron devices)
IEEE Joseph M. Biedenbach Outstanding Engineering Educator Award, 2004 (Citation: For contribution to exemplary teaching, research, and international collaboration)
IEEE ICSICT Contribution Award (2016).
IEEE Outstanding Educator Award, Florida Council (2003).

IEEE Outstanding Educator Award, Orlando Section (2003).
IEEE 10th Anniversary Award, Hong Kong Electron Device Meeting (2003).
Distinguished Lecturer, IEEE Electron Devices Society (2002-present).
Outstanding Contribution Award, IEEE International Microelectronics Conference (2000).
IEEE Engineer of the Year, Orlando Section (1992).
Best Paper Award, IEEE International Symposium on Physical and Failure Analysis of Integrated Circuits (2010).
Best Paper Award, IEEE International Reliability Physics Symposium (2009).

Other Awards Received

Outstanding Scholar Award, Taiwan Association of Academic Innovation (2017)
Distinguished Alumni Award, St. John University, Taiwan (2013)
Best Paper Award, American Society of Engineering Education Annual Meeting (1991)
Best Paper Award, Taiwan ESD and Reliability Conference (2015)
Distinguished Lecturer, National Science Council (2005-present)
Eminent Engineer, Tau Beta Pi (1992).
Visiting Senior Fellow, National University of Singapore, Singapore (1997).
U.S. Air Force Summer Faculty Fellow, Air Force Office of Scientific Research, Wright-Patterson AFB, Dayton, Ohio (1992, 1993, 1994).
Honors in B.S., Electrical Engineering Dept., University of Florida (1982).
Who's Who Among Young American Professionals, Who's Who in the South and Southwest, Who's Who in Technology, Who's Who in Science and Engineering, Who's Who in America, Dictionary of International Biography.

SUMMARY OF CONTRIBUTIONS:

Teaching (Details in Teaching Section)
   Taught more than 10 different undergraduate and graduate courses in Electrical Engineering with top 20% student teaching evaluations.
   Supervised more than 70 M.S./Ph.D. students and visiting scholars. Many of Dr. Liou's graduate students received fellowships, summer internships, and prestigious awards from the IEEE.
   Supervised more than 10 undergraduate students under research experiences for undergraduates (REU) projects funded by the National Science Foundation (NSF) and Semiconductor Research Corp. (SRC).
   Developed 3 new courses in the area of microelectronics.
   Published 13 text/reference books and 2 book chapters in the area of semiconductor device physics, modeling and simulation. Three more books contracted and in press/under preparation.

Research (Details in Research Section)
   Published more than 320 journal papers (including 23 invited review articles) and more than 240 conference papers (including more than 110 keynote/invited papers) in the field of semiconductor device modeling, simulation, reliability, and characterization.

Awarded 55 patents on the subject of microchip ESD protection.

More than 7,000 citations have been made on the articles published by Dr. Liou, according to the citation database by Institute for Scientific Information.

Established the Semiconductor Device Characterization Lab at UCF. The lab is equipped with microelectronics measurement and testing equipment purchased from a UCF grant ($150,000) and Lucent Technologies equipment donation ($430,000).

Established the Solid State Electronics Lab at UCF. The lab is equipped with several high-end Sun workstations and PCs to carry out research on computer-aided design of semiconductor devices and integrated circuits.

Established the Lockheed Martin Synthetic Environment Learning Center at UCF. This center was funded by Lockheed Martin with a budget of $500,000.

Established the Electrostatic Discharge (ESD) Design Center at Zhejiang University, China. The center, funded by the government and industry with a budget of $500,000, is equipped with advanced probe station, ESD testing facilities, and ESD design tools.

Obtained more than $13.0 million of research funding from federal agencies, state government, and semiconductor industry including National Science Foundation, DARPA, Navy, Air Force, NIST, Semiconductor Research Corporation, Intel Corp., Harris Semiconductor, Intersil Corp., Conexant Systems, Analog Devices, National Semiconductor, Alcatel Space, Fairchild Semiconductor, Texas Instruments, Lucent Technologies, etc.

Internationally known expert in the areas of electron devices and electrostatic discharge, as evidenced by the many keynote/invited papers at international conferences and invited presentations at companies and universities worldwide.

Administrative Experience and Professional Service (Details in Administrative Experience and Service Section)

Served as the College of Engineering and Computer Science Director of Research Program. Duties include promotion of collaborative projects with the industry sectors and federal agencies, and recruitment of graduate students, and development of international academic agreements.

Served as the College of Engineering and Computer Science Associate Dean. Coordinated graduate curriculum in the College, administrated recruiting, admission, and graduation processes, allocated funding for fellowships, scholarships and tuition waivers, and represented the College on graduate affair issues. The College currently has five graduate programs and about 1,200 graduate students.

Served as the ECE Dept. Graduate Coordinator and helped to increase the graduate enrollment from about 100 in 1994 to about 250 in 1999. Coordinated graduate curriculum in the ECE Dept. and gave presentations to industry and universities about the ECE graduate program. Administrated and allocated fellowships, scholarships, and tuition waiver for graduate students in the ECE Dept.

Served as the ECE Dept. Resource Development Officer and developed collaborative educational and research programs with local industry (i.e., Lockheed Martin, Harris Semiconductor, and Lucent Technologies) and universities abroad.

Served as associate/regional editor for two international journals.

Served as the Vice President, Treasurer, Finance Committee Chair of the IEEE Electron Device Society.

Served as the general or technical program chair of for more than 15 international conferences.

Served as a technical reviewer for many journal papers, book publishers, and conferences.

Served as a chair or member for many state/university/college/department committees.

Served as the president for two community associations in Florida.

II. Descriptions of Teaching, Research, and Administrative Experiences and Service

<u>II.1 TEACHING</u>

Publications Related to Teaching

1) Textbook (graduate-level): J. J. Liou, ***Advanced Semiconductor Device Physics and Modeling***, 9 chapters, 500 pages, Artech House, Inc., Boston, Feb. 1994.
2) Text book (graduate-level): J. J. Liou, ***Principles & Analysis of AlGaAs/GaAs Heterojunction Bipolar Transistors***, 8 chapters, 300 pages, Artech House, Inc., Boston, Feb. 1996.
3) Textbook (senior-level): J. S. Yuan and J. J. Liou, ***Semiconductor Device Physics and Simulation***, 9 chapters, 350 pages, Springer Publishers, New York, May 1998.
4) Textbook (graduate-level): J. J. Liou, A. Ortiz-Conde, and F. Garcia Sanchez, ***Analysis And Design of MOSFETs: Modeling, Simulation, and Parameter Extraction***, 6 chapters, 350 pages, Springer Publishers, New York, Sept. 1998.
5) Textbook (graduate-level): F. Schwierz and J. J. Liou, ***Modern RF/Microwave Transistors: Theory, Design, and Applications***, 8 chapters, 450 pages, Wiley, New York, 2003.

Textbook (graduate-level): J. Vinson, J. Bernier, G. Croft, and J. J. Liou, ***Electrostatic Discharge Analysis and Design Handbook***, 6 chapters, 300 pages, Springer Publishers, New York, Dec. 2003.

Textbook (graduate-level): C. Claeys, H. Iwai, M. Tao, and J. J. Liou, ***ULSI Process Integration***, 7 chapters, 500 pages, The Electrochemical Society, New York, Oct. 2007.

Textbook (graduate-level): J. J. Liou, F. Schwierz, and H. Wong, ***Nanometer MOS Devices***, 5 chapters, 300 pages, World Scientific Publishers, Singapore, Jan. 2009.

Textbook (graduate-level): Z. Gan, W. Wong, and J. J. Liou, ***Semiconductor Process Reliability in Practice***, 11 chapters, 500 pages, McGraw-Hill, New York, Nov. 2012.

Textbook (graduate-level): Y. Han, S. Dong, and J. J. Liou, ***Design, Methodology, and Implementation of Electrostatic Discharge for Integrated Circuits***, 12 chapters, 400 pages, China Science and Technology Publisher, Beijing, July 2014.

Textbook (graduate-level): Q. Cui, J. J. Liou, et al., ***On-Chip ESD Protection for Radio-Frequency/Microwave Integrated Circuits***, 6 chapters, 250 pages, Springer Publisher, New York, Feb. 2015.

Textbook (graduate-level): J. J. Liou (Editor), ***Electrostatic Discharge Protection of Semiconductor Devices and Integrated Circuits***, 10 chapters, 350 pages, CRC Press, New York, Oct. 2016.

Textbook (graduate-level): J. J. Liou and S. K. Liaw (Editors), ***Recent Advances on Nano Devices and Sensors***, 12 chapters, 250 pages, De Gruyter Publisher, Boston, May 2016.

Courses Taught

Linear Networks; Electrical Devices and Systems; Semiconductor Device Fabrication; Fundamental Semiconductor Device Physics; Advanced Semiconductor Device Physics; Device Electronics for Integrated Circuits; Electronic Circuit Design; and Electromagnetics.

Curriculum Development

Established the Solid State Electronics Lab at UCF. The lab is equipped with several high-end Sun workstations and PCs to carry out research on computer-aided design of semiconductor devices and integrated circuits.

Established the Semiconductor Device Characterization Lab at UCF. The lab is equipped with microelectronics measurement and testing equipment purchased from a UCF grant ($150,000) and Lucent Technologies equipment donation ($430,000).

Developed a new course in Microelectronics area, "Device Modeling and Circuit Simulation."

Developed a new course in Microelectronics area, "Device Electronics for Integrated Circuits."

Developed a new course in Microelectronics area, "Solar Cells: Theory and Application."

Developed a new course in Microelectronics area, "Advanced Semiconductor Device Physics and Modeling II."

Revised an existing course in Microelectronics area, "Advanced Semiconductor Device Physics and Modeling I."

Program Development

Contributed in developing the Minority Student Mentoring Program at University of Central Florida.

Contributed in developing an educational program between UCF and Lockheed Martin, Orlando, to encourage employees at Lockheed Martin to pursue M.S. and Ph.D. degrees at UCF.

Graduate Students/Visiting Scholars Supervised

Supervised 32 M.S. students (30 completed and 2 in progress), 28 Ph.D. students (24 completed and 4 in progress), and 4 visiting scholars.

Dissertation and Thesis Completed

Waisum Wong, "Computer-aided design and modeling of junction field-effect transistors," Ph.D. dissertation, Fall 1992.

Ching S. Ho, "Computer-aided analog and digital circuit design and simulation of adaptive resonance theory (ART) neural network architectures," Ph.D. dissertation, Fall 1994.

Yun Yue, "High-level free carrier injection in semiconductor devices," Ph.D. dissertation, Spring 1996.

S. H. Sheu, "Analysis and modeling of physical mechanisms contributing to the AlGaAs/GaAs heterojunction bipolar transistor reliability," Ph.D. dissertation, Spring 1997.

Jim E. Vinson, "Electrostatic discharge: protection technique and induced fusing in aluminum interconnect," Ph.D. dissertation, Fall 1998.

Jui-Chu Lee, "Characterization and modeling of electrostatic discharge (ESD) in semiconductor devices and ICs," Ph.D. dissertation, Summer 2000.

Qiang Zhang, "Statistical modeling of MOS devices, circuits, and interconnects for

improved manufacturability of IC design," Ph.D. dissertation, Spring 2001.

Xiaofang Gao, "Development of improved CAD tools for electrostatic discharge simulation of semiconductor devices and integrated circuits," Ph.D. dissertation, Fall 2002.

Zhi Cui, "Development of a Spice-like reliability model for RF CMOS devices and IC's," Ph.D. dissertation, Spring 2005.

Javier Salcedo, "Design and characterization of electrostatic discharge protection for microchips," Ph.D. dissertation, Summer 2006.

Ji Chen, "Design, modeling and optimization of spiral inductors for RF applications," Ph.D. dissertation, Fall 2006.

Hao Ding, "Compact modeling of four-terminal junction field-effect transistors," Ph.D. dissertation, Spring 2007.

Lifang Lou, "Design and compact modeling of silicon controlled rectifier for electrostatic discharge protection applications," Ph.D. dissertation, Fall 2008.

Zhiwei Liu, "Design of silicon controlled rectifiers for robust electrostatic discharge protection applications," Ph.D. dissertation, Summer 2009.

You Li, "Design of low-capacitance, high-speed electrostatic discharge devices for low-voltage protection applications," Ph.D. dissertation, Fall 2010.

Xiang Liu, "Modeling and simulation of reliability of GaAs heterjunction bipolar transistor (HBT) and HBT-based integrated circuits," Ph.D. dissertation, Summer 2011.

Slavica Malobabic, "Transient safe operation area for ESD applications," Ph.D. dissertation, Summer 2012.

Wen Liu, "Design and characterization of silicon nanowire and organic technologies for ESD applications," Ph.D. dissertation, Fall 2012.

Qiang Cui, "Design and development of electrostatic discharge protection solutions for high-speed input/output interfaces," Ph.D. dissertation, Spring 2013.

Sirui Luo, "Design, characterization and analysis of component level ESD protection solutions," Ph.D. dissertation, Spring 2015

Zhixin Wang, "Design of novel devices and circuits for ESD protection applications in advanced semiconductor technologies," Ph.D. dissertation, Spring 2015.

Yunfeng Xi, "Design and optimization of electrostatic discharge and surge protection solutions," Ph.D. dissertation, Spring 2016.

Meng Miao, "Development of robust and accurate compact models for electrostatic discharge protection applications," Ph.D. dissertation, Spring 2017.

Xiaozhong Huang, "Robust and latchup-immune devices for ESD protection of high-voltage integrated circuits," Ph.D. dissertation, Fall 2017.

William A. Drafts, "Modeling the heterojunction bipolar transistor for computer aided simulation," M.S. thesis, Spring 1990.

Scott Knapp, "Charge transport in acoustic charge transport devices," M.S. thesis, Fall 1990.

Ken L. Jones, "Application of response surface and robust design methods to semiconductor process and device modeling," M.S. thesis, Fall 1991.

Hooman Shakouri, "Numerical simulation and fabrication of photoconductive circuit elements," M.S. thesis, Fall 1992.

Huiping Chen, "One step direct convergence characteristics of hebbian-type associative memory with failed interconnections," M.S. thesis, Spring 1993.

Donald Wuerz, "Adaptive resonance theory (ART) neural network circuit design and simulation," M.S. thesis, Fall 1993.

Andrew Kager, "Numerical study of single and multiple emitter finger AlGaAs/GaAs heterojunction bipolar transistors," M.S. thesis, Fall 1994.

Dilip Gupta, "Optimization of Si homojunction and Si/SiGe heterojunction bipolar transistors," M.S. thesis, Fall 1994.

Ashok Parthasarathy, "Simulation and analysis of semiconductor device using a two-dimensional device simulator," M.S. thesis, Fall 1994.

Shiow-Feng Lin, "Modeling the AlGaAs/GaAs heterojunction bipolar transistors operating between 300 and 500 K," M.S. thesis, Spring 1995.

Revathi Narayanan, "Device parameters extraction of submicron MOSFETs using device simulator," M.S. thesis, Summer 1995.

Jianzhong Xu, "Simulation and modeling of junction field-effect transistors," M.S. thesis, Spring 1996.

Zahid A. Latif, "Methods for extracting the MOSFET model parameters: simulations and applications," M.S. thesis, Fall 1996.

Md Hassan, "Extraction of key model parameters for conventional and LDD MOSFETs," M.S. thesis, Summer 1997.

Jing Xue, "A comprehensive and physics-based model for the quasi-neutral-region capacitance of p/n junction devices and its application to SPICE simulation," M.S. thesis, Summer 1997.

Rick Langford, "Semiconductor fabrication yield modeling," M.S. thesis, Spring 1998.

Xiaochong Cao, "Parameter extraction and optimization of new industry standard VBIC95 model," M.S. thesis, Spring, 1998.

Md. Anamal Hoque, "Simulation and characterization of electrostatic discharge in semiconductor devices," M.S. thesis, Fall 1999.

Shaed Hasan, "Simulation of poly-depletion effect on the characteristics of polysilicon-gate MOSFETs," M.S. thesis, Fall 2000.

Ying Tan, "Analysis of Reliability of AlGaAs/GaAs HBTs based on device simulation," M.S. thesis, Fall 2000.

Rozina Shireen, "Simulation of the effect of polysilicon-gate depletion on the subthreshold behavior of submicron MOSFETs," M.S. thesis, Summer 2001.

Ji Chen, "Design of spiral inductor for RF applications," M.S. thesis, Spring 2006.

Chi-Tae Chen, "Database development of ESD protection designs," M.S. thesis, Fall 2006.

Xiang Liu, "Simulation of reliability of GaAs-based heterojunction bipolar transistors," M.S. thesis, Fall 2006.

Brian Cheng, "Modeling of deep submicron MOS devices," M.S. thesis, Fall 2006.

Slavica Malobabic, "TCAD simulation of safe operating area for ESD applications," M.S. thesis, Spring 2009.

Blerina Aliaj, "2.5-D simulation of power array subject to ESD stresses," M.S. thesis, Fall 2009.

Wen Liu, "Characterization of emerging technologies for ESD protection applications," M.S. thesis, Spring 2010.

David Ellis, "Prediction of oxide failure under ESD stresses," M.S. thesis, Fall 2011.

Visiting Scholars

Wen-Yi Zhou, "Modeling and simulation of AlGaAs/GaAs HBTs," home institution: Tsinghua University, China, Fall 1996-Summer 1997, supported by the Chinese Academic & of Science.

Adelmo Ortiz-Conde, "Parameter extraction of advanced MOS devices," home institution: Simon Bolivar University, Venezuela, Fall 1997-Summer 1998, supported by the Science Foundation in Latin America.

Seonghearn Lee, "Modeling and characterization of advanced MOS devices," home institution: Hankuk University of Foreign Studies, Korea, Spring 2001, supported by the Korea National Science Foundation.

Abdul Baloch, "Design and characterization of Si/SiGe HBTs," home institution: Mehran University of Engineering & Technology, Pakistan, Spring 2001, supported by Fulbright Foundation.

Awards Supervised Students Received

W. W. Wong, Outstanding Graduate Student Award, IEEE Orlando Section, 1990.

W. W. Wong, Student Excellence in Research Award, University of Central Florida, 1991.

Hooman Shakouri, Student Excellence in Research Award, University of Central Florida, 1991.

D. Wuerz, Who's Who in American Colleges and Universities, 1992.

Andy Kager, Research Graduate Student Summer Internship, Air Force Research Laboratory, Dayton, Ohio, 1994.

Yun Yue, Outstanding Graduate Student Award, IEEE Orlando Section, 1996.

Zahid Latif, Graduate Student Summer Internship, Lucent Technologies, Orlando, FL, 1996.

R. Lee, Graduate Student Summer Internship, Harris Semiconductor, Melbourne, FL, 1998.

A. Sun, Graduate Student Summer Internship, Lucent Technologies, Orlando, FL, 1998.

Y. Ma, Summer Fellowship, University of Central Florida, 1999.

Q. Zhang, Graduate Student Summer Internship, Lucent Technologies, Orlando, FL, 1999.

Kelcia Edwards, Undergraduate Summer Scholarship, Semiconductor Research Corporation, 1999.

Q. Zhang, Graduate Student Summer Internship, Lucent Technologies, Orlando, FL, 2000.

S. Roberts, Undergraduate Student Summer Internship, Lucent Technologies, Orlando, FL, 2000.

Ying Tan, Graduate Enhancement Award, University of Central Florida, 2000.

X. Gao, EE Graduate Fellowship, University of Central Florida, 2000.

G. Yi, EE Graduate Fellowship, University of Central Florida, 2001.

Zhi Cui, Provost Fellowship, University of Central Florida, 2001.

M. Gupta, Graduate Summer Internship, Philips Research Laboratory, Belgium, 2001.

Ji Chen, Graduate Student Summer Internship, Skyworks Inc., LA, CA, 2002.

Yue Fu, Presidential Fellowship, University of Central Florida, 2002.

Javier Salcedo, Outstanding Graduate Student Award, IEEE Orlando Section, 2003.

Ji Chen, Graduate Student Summer Internship, Conexant Systems, LA, CA, 2003-2005.

Javier Salcedo, Graduate Student Summer Internship, National Institute of Standards and Technology, Washington DC, 2003-2006.
Javier Salcedo, EDS Graduate Student Fellowship Award, IEEE Worldwide, 2003.
Hao Ding, Graduate Student Summer Internship, Texas Instruments, Dallas, TX, 2004-2005.
Lifang Lou, Graduate Student Summer Internship, Fairchild Semiconductor, Portland, ME, 2005-2006.
Dennis Chen, Graduate Student Summer Internship, Taiwan Semiconductor Manufacturing Co., Taiwan, 2005.
Slavica Molbabic, Graduate Student Fellowship Award, IEEE Region 9, 2005.
Xiang Liu, Graduate Student Summer Internship, Intersil Corp., 2006.
Brain Cheng, Graduate Student Summer Internship, Conexant Systems, 2006.
Zhiwei Liu, Outstanding Graduate Student Award, IEEE Orlando Section, 2007.
Blerina Aliaj, EDS Master Student Fellowship Award, IEEE Worldwide, 2008.
Xiang Liu, Outstanding Graduate Student Award, IEEE Orlando Section, 2008.
You Li, Outstanding Graduate Student Award, IEEE Orlando Section, 2009.
David Ellis, Outstanding Graduate Student Award, IEEE Orlando Section, 2010.
Wen Liu, Outstanding Graduate Student Award, IEEE Orlando Section, 2012.
Zhixin Wang, Graduate Student Scholarship Award, IEEE Orlando Section, 2012.

II.2 RESEARCH

Research Grants and Contracts
   Principal or coprincipal investigator for over $13.0 million of research grants from federal agencies (NSF, DARPA, NASA, Air Force, Navy, NIST), State, and industry (Semiconductor Research Corp., Intel Corp., Lucent Technologies, Texas Instruments, Conexant Systems, Alcatel Space, Harris Semiconductor, National Semiconductor, Fairchild Semiconductor, Analog Devices, Intersil Corporation, Maxim Integrated Systems, Allegro Microsystems, Lockheed Martin, etc.).

"Modeling the Heterojunction Bipolar Transistors-I," Advanced Research Project Agency (Co-PI), $300,000, Sept. 1988-Sept. 1989.
"Modeling the Heterojunction Bipolar Transistors-II," Advanced Research Project Agency (Co-PI), $300,000, Sept. 1989-Sept. 1991.
"Neural Network Design for Wafer Scale Integration," Advanced Research Project Agency (Co-PI), $97,000, Sept. 1989-Sept. 1991.
"Designing the Photoconductive Switch for Power Applications-I," Florida High Tech. Council (PI), $20,000, Jan. 1988-Dec. 1988.
"Designing the Photoconductive Switch for Power Applications-II," Florida High Tech. Council (PI), $50,000, Jan. 1989-Dec. 1989.
"Designing the Photoconductive Switch for Power Applications-III," Florida High Tech. Council (PI), $50,000, Jan. 1990-Dec. 1990.
"Acoustic/Semiconductor Integration-I," Florida High Tech. Council (Co-PI), $130,000, Jan. 1988-Dec. 1988.

"Acoustic/Semiconductor Integration-II," Florida High Tech. Council (Co-PI), $200,000, Jan. 1989-Dec. 1989.

"Acoustic/Semiconductor Integration-III," Florida High Tech. Council (Co-PI), $95,000, Jan. 1990-Dec. 1990.

"Modeling the Junction Field-Effect Transistor for CAD," DSR/UCF (PI), $5,000, May 1989-May 1990.

"A Neural Network-Based Adaptive Sensor Array System-II," Florida High Tech. Council (PI), $25,000, Jan. 1991-Dec. 1991.

"A Neural Network-Based Adaptive Sensor Array System-III," Florida High Tech. Council (PI), $40,000, Jan. 1992-Dec. 1992.

"A Neural Network-Based Adaptive Sensor Array System-IV," Florida High Tech. Council (PI), $38,000, Jan. 1993-Dec. 1993.

"Design and Modeling the HBT's" DSR/UCF Development Grant (PI), $10,000, June 1991-June 1992.

"PISCES Simulations of Photoconductive Circuit Elements," ORDEN/ERC Government Systems, Boston, MA (PI), $2,500, Dec. 1991.

"Circuit Design and Simulation of Neural Network," DSR/UCF Special Grant (Co-PI), $5,000, June 1992-June 1993.

"A Physics-Based Heterojunction Bipolar Transistor Model Including Thermal, Avalanche Multiplication, and Multi-Emitter Finger Effects," Air Force Office of Scientific Research (PI), $20,000, Jan. 1993-Dec. 1993.

"Software Donation of MEDECI 1.1, HD-AAM, and LT-AAM for the Heterojunction Bipolar Transistor Research," Technology Modeling Associates, Inc., Palo Alto, CA (Co- PI), $35,000, June 1993.

"Study of Commutation Voltage and Current-Handling Characteristics of Optically-Activated Silicon Switches," Office of Naval Research (PI), $18,000, Aug. 1993-July 1994.

"Hardware Implementation of ART-1 and Fuzzy ART Neural Networks," Harris Semiconductor Corp., Melbourne, FL (PI), $10,000, Aug. 1, 1993-July 31, 1994.

"A Neural Network-Based Adaptive Sensor Array System-V," Florida High Tech. Council (PI), $25,000, Jan. 1994-Dec. 1994.

"Investigation of AlGaAs/GaAs Heterojunction Bipolar Transistor Reliability Based on Noise and Leakage Current Characteristics," Air Force Office of Scientific Research (PI), $25,000, Jan. 1995-Dec. 1995.

"Design, Simulation and Fabrication of High Quantum Efficiency Photodetectors," L. J. Edison Laboratories (PI), $25,000, May 1995-Apr. 1997.

"Summer Mentoring of Minority Students in Science and Engineering," UCF Strategic Planning Award (Co-PI), $26,100, May 1995-Apr. 1996.

"Analysis and Modeling of AlGaAs/GaAs Heterojunction Bipolar Transistor Reliability," Defense Advanced Research Project Agency (PI), $52,000, Mar. 1996-Feb. 1997.

"Research on Low Cost Platform," Lockheed Martin (Co-PI), $10,000, Feb. 1996-Jan. 1997.

"Development of Power Electronics Undergraduate Curriculum," UCF Strategic Planning Award (Co-PI), $25,000, May 1996-Apr. 1997.

"Development of Bipolar Transistor Parameter Extraction Software for Industry Standard VBIC95 Model," Lucent Technologies (PI), $32,000, Sept. 1996-June 1997.

"Development of Bipolar Transistor Parameter Extraction Software for Industry Standard VBIC95 Model," (continuation) Lucent Technologies (PI), $38,000, Jan. 1 1998-Dec. 31, 1998.

"An Improved Methodology for SPICE simulation of Electrostatic Discharge (ESD) in Integrated Circuits," Harris Semiconductor (PI), $50,000, Jan. 1, 1998-Dec. 31, 1999.

"Enhancement of Microelectronics Program in the ECE Dept. at UCF," Florida I-4 Corridor Council (Co-PI), $250,000, July 1, 1998-June 30, 1999.

"Development of Synthetic Environment Learning Center at University of Central Florida," Lockheed Martin (Co-PI), $500,000, Jan. 1, 1999-Dec. 31, 2002.

"Research Experiences for Undergraduates in Process Automation and Device/Circuit Designs for Semiconductor Manufacturing," National Science Foundation (Co-PI), $170,000, Jan. 1, 1999-Dec. 31, 2000.

"Development of Microelectronics Design Center at UCF," UCF Equipment Funding Award (PI), $145,465, Feb. 1999.

"Equipment for Measuring the Flat Panel Display Manufacturing," UCF Equipment Funding Award (Co-PI), $52,000, Feb. 1999.

"Equipment for Microelectronics Design Center at University of Central Florida," Lucent Technologies (PI), $430,000, March 1999.

"International Cooperative Research Project Between University of Central Florida and Technical University Ilmenau, Germany," National Science Foundation (PI), $22,100, Feb. 1, 1999-Jan. 31, 2001.

"Development of Improved Methodology for Measurements and SPICE Simulation of Electrostatic Discharge in Integrated Circuits," Semiconductor Research Corporation (PI), $150,000, Dec. 1, 1998-Nov. 30, 2001.

"SRC Summer Undergraduate Scholarship for ESD Research," Semiconductor Research Corporation (PI), $5,000, May 1, 1999-April 30, 2000.

"Measurements, Modeling, and Simulation of Electrostatic Discharge in Semiconductor Devices," Intersil Corp. and UCF (PI), $40,000, July 1, 1999-June 30, 2000.

"Research in Digital Signal Processing/Wireless Communications Technology," Intersil Corp. (Co-PI), $270,000, Jan. 1, 2000-Dec. 31, 2002.

"Graduate Students Summer Internship on Microelectronics Projects," Lucent Technologies (PI), $86,400, May 1, 2000-Aug. 31, 2002.

"International Travel Grant," National Science Foundation (PI), $1,200, June 2000.

"International Travel Grant," College of Engineering & Computer Science, UCF (PI), $1,500, Nov. 2000.

"SRC Research Experiences for Undergraduates in Microelectronics," Semiconductor Research Corporation (PI), $60,000, Oct. 1, 2000-Sept. 1, 2002.

"Intersil/UCF Partnership on Wireless Communications," I-4 Phase III (Co-PI), $60,000, July 1, 2000-June 30, 2001.

"From Antennas to Bits: Intersil Corp./UCF Partnership," I-4 Phase IV (Co-PI), $70,000, Jan. 1, 2001- Dec. 31, 2001.

"Physical Transport Models for Nano-Scale MOS Devices, with Applications to Computer-Aided Design for Next-Generation Integrated Circuits," Semiconductor Research Corporation (Co-PI), $35,000, Jan. 1, 2001-Dec. 31, 2001.

"From Antennas to Bits: Intersil Corp./UCF Partnership," I-4 Phase V (Co-PI), $90,000, Jan. 1,

2002-Dec. 31, 2002.

"Development of Electrostatic Discharge Protection Circuitry for RF Microchips," Intel Corporation (PI), $60,000, Mar. 1, 2002-Dec. 31, 2003.

"Research in Digital Signal Processing/Wireless Communications Technology," Intersil Corp. (Co-PI), $90,000, Jan. 1, 2003-Dec. 31, 2003.

"From Antennas to Bits: Intersil Corp./UCF Partnership," I-4 Phase VI (Co-PI), $72,000, Jan. 1, 2003-Dec. 31, 2003.

"Isolated Top and Bottom Gate Junction Field-Effect Transistor Model for CAD Circuit Design," Semiconductor Research Corp./Texas Instruments (PI), $150,000, May 1, 2003-April 30, 2006.

"Electrostatic Discharge Protection for Multi-Technology Systems on a Chip," National Institute of Standards and Technology (PI), $25,000, July 1, 2003-Dec. 31, 2003.

"Design and Development of Robust ESD Protection Structures," Intersil Corp./I-4 (PI), $60,000, Oct. 1, 2003-Dec. 31, 2004.

"Electrostatic Discharge Protection for Gas-Sensor and MEMS Chip," National Institute of Standards and Technology (PI), $25,000, April 1, 2004-Dec. 31, 2004.

"Reliability Study and Modeling of RF CMOS for Wireless Applications," Conexant Systems/ I-4 (PI), $45,000, April 1, 2004-Mar. 1, 2005.

"Reliability Study and Modeling of GaAs-Based HBT's" Alcatel Space Co. (PI), $45,000, July 1, 2004-June 30, 2005.

"Electrostatic Discharge Protection for Gas-Sensor and MEMS Chip," National Institute of Standards and Technology (PI), $60,000, Oct. 1, 2004-Dec. 31, 2005.

"Noise Characterization and Modeling of MOS Devices for Wireless Applications," Conexant Systems/I-4 (PI), $75,000, Feb. 1, 2005-June 30, 2006.

"Design and Development of Robust ESD Protection Structures," Intersil Corp./I-4 (PI), $85,000, Feb. 1, 2005-June 30, 2006.

"Modeling and Design of MOS Devices for Wireless Applications," Conexant Systems/I-4 (PI), $85,000, Jan. 1, 2006-Dec. 31, 2006.

"Development of Robust ESD Protection Structures for Data Communication Transceiver," Intersil Corp./I-4 (PI), $116,000, May 1, 2006-Aug. 31, 2007.

"Design and Development of Robust ESD Protection Solutions," Fairchild Semiconductor, (PI), $30,000, Aug. 1, 2006-Aug. 31, 2007.

"Electrostatic Discharge Protection for Gas-Sensor and MEMS Chip," National Institute of Standards and Technology (PI), $29,800, Mar. 1, 2006-Oct. 31, 2006.

"Evaluation and Qualification of GaAs-Based HBT's for Space Applications," Alcatel Space Co. (PI), $45,000, Dec. 15, 2006-Dec. 31, 2007.

"ESD Design, Modeling and Simulation," Huahong-NEC Corp. (PI), $35,000, Dec. 2006-Dec. 2007.

"Robust ESD Designs for Mixed Analog/Digital Integrated Circuits," Analog Devices Inc. (PI), $75,000, May 1, 2007-April 30, 2008.

"Design and Development of ESD Protection for High-Speed Interface Microchips," Intersil Corp./I4 (PI), $120,000, Sept. 1, 2007-Dec. 31, 2008.

"Failure Matrix Development for CDM ESD Events," Analog Devices Inc. (PI), $600,000, Sept. 1, 2008-Aug. 30, 2014.

"Nanotechnology ESD for the Next-Generation Electronics," Korea Nanotechnology Council (PI), $200,000, June 1, 2008-Dec. 31, 2011.

"Development of a Standard Methodology for the Design and Optimization of ESD Protection of Power Switching Regulators," National Semiconductor Corp. (PI), $180,000, June 1, 2008-May 31, 2011.

"Electrostatic Dust Hazard Prediction and Control for Lunar and Mars Missions," NASA Space Initiative (Co-PI), $1,200,000, Feb. 1, 2009-Jan. 31, 2012.

"Design and Characterization of Transient Power Clamps for ESD Protection Applications," Intersil Corp. (PI), $220,000, May 1, 2011-Apr. 30, 2016.

"Design and Development of System-Level ESD Protection Solutions," Maxim Integrated Systems (PI), $40,000, Oct. 1, 2012-Sept. 30, 2013.

"Design, Characterization, and Optimization of Electrostatic Discharge (ESD) Power Clamps for Automotive Electronics," Allegro Microsystems (PI), $40,000, May 1, 2013-April 30, 2014.

"Failure Matrix Development for CDM ESD Events," Analog Devices Inc. (PI), $600,000, Sept. 1, 2014-Aug. 30, 2019.

"Design, Characterization, and Optimization of Electrostatic Discharge (ESD) Power Clamps for Automotive Electronics," Allegro Microsystems (PI), $144,000, May 1, 2014-April 30, 2017.

"Design and Characterization of Electromagnetic Compatibility for Integrated Circuits," Siruiqi Information Corp. (PI), $52,000, Jan. 1, 2015-Dec. 31, 2016.

"Design and Development of GaN-Based ESD Protection Solutions," CNSF (PI), $100,000, Jan. 1, 2018-Dec. 31, 2021.

Research Center/Lab Development

Electrostatic Discharge (ESD) Lab, University of Central Florida. Funded by projects from several leading semiconductor companies in the U.S., this lab is equipped with the state of the art ESD testing equipment and several high-end servers to carry out research on the design, simulation, and characterization of ESD protection technologies.

Semiconductor Device Characterization Lab, University of Central Florida. The lab is equipped with microelectronics measurement and testing equipment purchased from a UCF grant ($150,000) and Lucent Technologies equipment donation ($430,000).

Synthetic Environment Learning Center at UCF. This center was funded by Lockheed Martin with a budget of $500,000.

Electrostatic Discharge (ESD) Design Center, Zhejiang University, China. The center was funded by grants totaling $500,000 from the Chinese government, Zhejiang University and semiconductor industry in China. The center is equipped with advanced probe station, ESD testing facilities, and ESD design tools.

Electrostatic Discharge (ESD) Design and Failure Analysis Center, Singapore Institute of manufacturing Technology (SIMTech), Singapore. The center was funded by a grant of $1,000,000 from the government and semiconductor industry in Singapore. The center is equipped with advanced probe station, ESD testing and failure analysis facilities.

Innovation and Commercialization Center for Application-Specific Integrated Circuits, Kunshan Institute of High Technology, China. The center was funded by a grant of $2,500,000 from the Kunshan City government. The center is equipped with advanced probe station, ESD

testing and high-frequency characterization facilities.

Publications

18 patents, 13 books, 2 book chapters, 330 refereed journal articles (including 23 invited review articles), 256 conference papers (including 124 keynote/invited papers), and 1 conference proceedings. List of publications attached at the end of vitae.

II.3 ADMINISTRATIVE EXPERIENCES AND SERVICE

Administrative Experiences as Associate Dean in College of Engineering and Computer Science

Coordinated the graduate programs in the College of Engineering and Computer Science (CECS). The college has 5 graduate programs and more than 1,200 graduate students.

Allocated scholarships, fellowships, and tuition waivers among the five departments in CECS (budget of about $3 millions).

Supervised and assisted curriculum/course development in CECS.

Administrated graduate applications, admissions, and graduations.

Represented the College on the university committees for graduate affairs.

Served as the College representative to promote and establish cooperative programs in the industry and at universities worldwide.

Recruited and retained quality graduate students in the U.S. and abroad.

Administrative Experiences as Graduate Coordinator in Electrical and Computer Engineering Dept.

Recruited graduate students and reviewed M.S. and Ph.D. applications in the Electrical and Computer Engineering program. Also, advised graduate students (100 Ph.D. and 150 M.S. in 1998-1999) on course enrollment, program of study, and graduation requirements.

Administrated and allocated fellowships, scholarships, and tuition waiver for graduate students (budget of about $400,000 in 1998-1999).

Coordinated graduate curriculum in the ECE Dept. and gave presentations to industry and universities about the ECE graduate program.

Developed an official and long-term research program between Lockheed Martin and UCF. The program is intended to encourage the employees at Lockheed Martin to pursue M.S. and Ph.D. degrees at UCF and to provide the ECE faculty incentives to supervise students from Lockheed Martin. About 15 students from Lockheed Martin enrolled in this program each year.

Led the ECE Dept. faculty in establishing training and research programs with Lucent Technologies, Orlando. Attended meetings to discuss possible training courses, and organized meetings for ECE faculty and students to present their research activities to Lucent Technologies.

Led the ECE Dept. faculty in developing the Lockheed Martin Synthetic Environment Learning Center. The center was supported by Lockheed Martin with a budget of $500,000 for four years.

Obtained measurement and testing equipment (valued at $450,000) donated by Lucent Technologies, Orlando to enhance the research, teaching, and training in microelectronics.

Served as the UCF representative on a State committee to promote the microelectronics design

industry in Central Florida.

Established co-op programs with AT&T Orlando, Harris Semiconductor, and Raytheon Corp.

Established international collaborative agreements between the UCF and several universities in Asia, South America, and Europe.

Served as the coordinator for College of Engineering for UCF Minority Student Mentoring Program. The purpose of the program is to help and encourage minority students to enter the graduate program at UCF.

Coordinated ECE Lab tours for high school minority students.

Department/College/University Committees
College Sabbatical Committee, College of Engineering and Computer Science, 2013
Professional Fellow Committee, College of Engineering and Computer Science, 2014
International Scholar Committee, College of Engineering and Computer Science, 2014
Faculty Senate, University of Central Florida, 2010-2012
Graduate Committee, ECE Dept., 1988, 1989, 1990, 1991, 1992, 1994-1998 (chair), 1999-present
Undergraduate Committee, ECE Dept., 1992, 1993
Personnel and Tenure Committee, ECE Dept., 1991, 1993, 1994 (chair), 1995, 1998, 2000 (chair), 2001, 2002, 2004
Search Committee, ECE Dept., 1990, 1998, 1999, 2000, 2001, 2002 (chair), 2004 (chair), 2005 (chair), 2006 (chair), 2012, 2014
Microelectronics Subcommittee, ECE Dept., 1987-1990, 1991 (chair), 1992-present
Administrative Committee, ECE Dept., 1994-1998
Space and Lab Management Committee, ECE Dept., 1994 (chair)
Liaison Selection Committee, College of Engineering, 1990
Research Incentive AdHoc Committee, College of Engineering, 1991
Honors and Award Committee, College of Engineering, 1994
Laboratory Safety Committee, College of Engineering, 1994
Chemical Hygiene Committee, University of Central Florida, 1995-1998
Graduate Council, University of Central Florida, 1996-present
Research Council, University of Central Florida, 2001-2004
RIA Selection Committee, College of Engineering and Computer Science, 2002 (chair)

Community
Secretary, Chinese-American Scholar Association of Florida, 1991
Vice-president, Chinese American Association of Central Florida, 1994
President, Chinese American Association of Central Florida, 1995
Vice-president, Chinese-American Scholar Association of Florida, 1999
President, Chinese-American Scholar Association of Florida, 2000

III. List of Publications

Total: 18 patents, 13 books, 2 book chapters, 330 journal papers (including 23 invited review articles), 256 conference papers (including 124 keynote/invited papers), and numerous invited presentations.

Selected Patents

On-Chip Structure for Electrostatic Discharge Protection, U.S. Patent No. 7,202,114, 2009

Electrostatic Discharge Protection Device for Digital Circuits and for Applications with I/O Bipolar Voltage Much Higher than the Core Circuit Power Supply-I, U.S. Patent No. 7,285,828, 2010

Electrostatic Discharge Protection Device for Digital Circuits and for Applications with I/O Bipolar Voltage Much Higher than the Core Circuit Power Supply-II, U.S. Patent No. 7,479,414, 2011

Electrostatic Discharge Protection Devices with Adjustable Dual-Polarity Trigger and Holding Voltages-I, U.S. Patent No. 7,566,914, 2012

Electrostatic Discharge Protection Devices with Adjustable Dual-Polarity Trigger and Holding Voltages-II, U.S. Patent, No. 8,283,695, 2012

Novel On-Chip Structure for Electrostatic Discharge (ESD) Applications, U.S. Patent No. 7,601,991, 2012

Silicon-Controlled Rectifier Device for High-Voltage Electrostatic Discharge (ESD) Applications, U.S. Patent No. 7,842,971, 2013

Devices with Adjustable Dual-Polarity Trigger- and Holding-Voltage/Current for High-Level of Electrostatic Discharge Protection in Submicron Mixed Signal CMOS/BiCMOS Technology, U.S. Patent No. 7,985,640, 2013

Novel Multi-Gate pHEMT Devices for On-Chip Electrostatic Discharge (ESD) Protection of Gallium Arsenide Integrated Circuits, U.S. Patent No. 9,171,963, 2014

Electrostatic Discharge Protection Device for Low-Voltage Applications, U.S. Patent No. 9,318,481, 2015

Direct Connected Silicon Controlled Rectifier (SCR) having Internal Trigger, U.S. Patent No. 9,368,486, 2015

Electrostatic Discharge (ESD) Shunting Circuits, Taiwan Patent No. I518,866, 2016

No-Snapback SCR with Adjustable Trigger and Holding Voltages for High-Voltage ESD Protection Applications, U.S. Patent, filed Oct. 2015

Books

1. J. J. Liou, ***Advanced Semiconductor Device Physics and Modeling***, 9 chapters, 500 pages, Artech House, Inc., Boston, Feb. 1994. The book deals with the physics and modeling of eight important semiconductor devices used in integrated circuits. It has been adopted as text or reference at many universities worldwide including: University of Connecticut, University of Cincinnati, University of Illinois, Mercer University, India Institute of Technology (India), National Tsing Hua University (Taiwan), University of Simon Bolivar (Venezuela), University of Waterloo (Canada), Dong-A University

(Korea), Technical University Ilmenau (Germany), King's College in London (United Kingdom), City University of Hong Kong (Hong Kong), University of Bordeaux (France), and National University of Singapore (Singapore).

2. J. J. Liou, ***Principles and Analysis of AlGaAs/GaAs Heterojunction Bipolar Transistors***, 8 chapters, 300 pages, Artech House, Inc., Boston, Feb. 1996. This book focuses on an increasingly important high-speed semiconductor device called the heterojunction bipolar transistor (HBT). It is a widely used reference for researchers and engineers working in the HBT area.

3. J. S. Yuan and J. J. Liou, ***Semiconductor Device Physics and Simulation***, 9 chapters, 350 pages, Springer Publishers, New York, May 1998. A practical text/reference book addressing issues related to the designs and simulations of several important semiconductor devices.

4. J. J. Liou, A. Ortiz-Conde, and F. Garcia Sanchez, ***Analysis and Design of MOSFETs: Modeling, Simulation, and Parameter Extraction***, 6 chapters, 350 pages, Springer Publishers, New York, July 1998. A highly useful book for the students, researchers, and engineers interested in MOS devices and ICs. It covers a wide spectrum of topics critical to the design, simulation, and parameter extraction of such devices.

5. F. Schwierz and J. J. Liou, ***Modern RF/Microwave Transistors: Theory, Design, and Applications***, 8 chapters, 450 pages, Wiley, New York, 2003. A comprehensive and in-depth book covering the current status and future trends of semiconductor devices used in radio/microwave frequency electronic systems, such as wireless communications and high-speed internets.

J. Vinson, J. Bernier, G. Croft, and J. J. Liou, ***Electrostatic Discharge Analysis and Design Handbook***, 6 chapters, 300 pages, Springer Publishers, New York, Dec. 2003. A practical and up-to-date book on topics relevant to the physical mechanisms, failures, modeling, simulation, and design of electrostatic discharge (ESD) protection for integrated circuits.

C. Claeys, H. Iwai, M. Tao, and J. J. Liou, ***ULSI Process Integration***, 7 chapters, 500 pages, The Electrochemical Society, New York, Oct. 2007. This book covers recent development, progress, and advance in the area of ultra-large scale semiconductor process integration and optimization.

J. J. Liou, F. Schwierz, and H. Wong, ***Nanometer MOS Devices***, 5 chapters, 300 pages, World Scientific Publishers, Singapore, Jan. 2009. This book provides an in-depth and up-to-date coverage on the design, modeling, and characterization of the fast growing and evolving CMOS-based nanostructure semiconductor devices used in modern and next-generation electronic systems.

Z. Gan, W. Wong, and J. J. Liou, ***Semiconductor Process Reliability in Practice***, 11 chapters, 500 pages, McGraw-Hill, New York, Nov. 2012. This book offers a comprehensive and practical coverage on the design, modeling, and characterization pertinent to reliability and electrostatic discharge of modern MOS processes, devices, and integrated circuits.

Y. Han, S. Dong, and J. J. Liou, ***Design, Methodology, and Implementation of Electrostatic Discharge for Integrated Circuits***, 12 chapters, 400 pages, China Science and Technology Publisher, Beijing, July 2014. This book covers a wide range of subjects pertinent to the design and development of electrostatic discharge protection solutions for modern integrated circuits.

Q. Cui, J. J. Liou, et al., ***On-Chip ESD Protection for Radio-Frequency/Microwave Integrated Circuits***, 6 chapters, 250 pages, Springer Publisher, New York, Feb. 2015. This is the first book

focuses entirely on the concepts and approaches critical to the design and development of electrostatic discharge (ESD) protection solutions for high-frequency integrated circuits.

J. J. Liou (Editor), ***Electrostatic Discharge Protection of Semiconductor Devices and Integrated Circuits***, 13 chapters, 350 pages, CRC Press, New York, Oct. 2015. A highly useful and comprehensive edited book with 13 chapters written by renowned researchers and experts in the field of electrostatic discharge protection of devices and circuits. Subjects include design, modeling and simulation of ESD protection in Si CMOS, Si BCD, Si SOI, GaAs, and GaN technologies.

J. J. Liou and S. K. Liaw (Editors), ***Recent Advances on Nano Devices and Sensors***, 12 chapters, 250 pages, De Gruyter Publisher, Boston, May 2016. An edited book with chapters covering the recent progress and future directions of nano devices and sensors.

Book Chapters

Z. Cui and J. J. Liou, A New Approach to Characterize and Predict Lifetime of Deep-Submicron NMOS Devices, in ***Frontiers in Electrons*** (Editors: H. Iwai et al.), World Scientific Publisher, 2006. This book chapter describes the development of an advanced model to predict the reliability of MOS devices.

W. Liu and J. J. Liou, Characterization of Nanowire Field-Effect Transistors under Electrostatic Discharge Stresses, in ***Silicon Nanowire Field-Effect Transistors*** (Editors: Y. H. Jeong and D. M. Kim), Springer Publishers, 2013. This book chapter covers the electrostatic discharge (ESD) characterization and ESD protection solutions of the emerging Si nanowire field-effect transistors.

Journal Papers Published or Accepted (including 22 invited review papers, and the following in the leading and most referenced journals in Electron Devices area: 122 in IEEE Transactions/Letters, 82 in Solid-State Electronics, 48 in Microelectronics Reliability, and 29 in Journal of Applied Physics/Applied Physics Letters)

d)-1 Invited Review Papers

1. J. J. Liou, "Long-term base current instability in AlGaAs/GaAs HBTs: physical mechanisms, modeling, and SPICE simulation," Microelectronics Reliability, vol. 38, pp. 709-725, May 1998.
2. J. J. Liou, "Long-term base current instability: a major concern for the reliability of AlGaAs/GaAs HBTs," Romanian Journal of Information Science & Technology, vol. 20, pp. 1-18, July 1999.
3. F. J. Garcia Sanchez, A. Ortiz-Conde, and J. J. Liou, "On the extraction of the source and drain series resistances of MOSFETs," Microelectronics Reliability, vol. 39, pp. 1173-1184, Aug. 1999.
4. J. C. Lee, G. D. Croft, J. J. Liou, W. R. Young, and J. Bernier, "Modeling and measurement approaches for electrostatic discharge in semiconductor devices and ICs: an overview," Microelectronics Reliability, vol. 39, pp. 579-594, May 1999.

A. Ortiz-Conde, F. J. Garcia Sanchez, and J. J. Liou, "On the extraction of threshold voltage, effective channel length and series resistance of MOSFETs," Journal of Telecommunications and

Information Technology, vol. 3, pp. 43-60, April 2000.

6. F. Schwierz and J. J. Liou, "Semiconductor devices for RF applications: evolution and current status," Microelectronics Reliability, vol. 41, pp. 145-168, Feb. 2001.

7. J. E. Vinson and J. J. Liou, "Electrostatic discharge in semiconductor devices: protection techniques," Proceedings of the IEEE, vol. 88, pp. 1878-1900, Dec. 2000.

8. J. J. Liou and C. I. Huang, "AlGaAs/GaAs heterojunction bipolar transistors for power applications: issues of thermal effect and reliability," Microelectronics Journal, vol. 32, pp. 419-432, June 2001.

9. J. J. Liou, Q. Zhang, J. McMacken, J. Thomson, K. Stiles, and P. Layman, "Statistical modeling of MOS devices for parametric yield prediction," Microelectronics Reliability, vol. 42, pp. 787-795, May 2002.

A. Ortiz-Conde, F. J. Garcia Sanchez, J. J. Liou, A. Cerderia, M. Estrada, and Y. Yue, "A review of recent MOSFET threshold voltage extraction methods," Microelectronics Reliability, vol. 42, pp. 583-596, May 2002.

J. J. Liou and F. Schwierz, "RF MOSFET: recent advances, current status and future trends," Solid-St. Electron., vol. 47, pp. 1881-1895, Oct. 2003.

J. J. Liou and F. Schwierz, "Evolution and recent advances in RF transistors," Journal of Telecommunications and Information Technology, vol. 14, pp. 1-7, Jan. 2004.

J. Chen and J. J. Liou, "On-chip spiral inductors for RF applications: an overview," Journal of Semiconductor Technology and Science, vol. 4, pp. 149-167, Sept. 2004.

F. Schwierz and J. J. Liou, "RF transistors: recent developments and roadmap toward terahertz applications," Solid-St. Electron., vol. 51, pp. 1079-1091, Aug. 2007.

Y. Li, J. J. Liou, S. Dong, and H. Yan, "Design of robust and low-capacitance diodes for low-voltage electrostatic discharge (ESD) protection," Journal of Science A, pp. 167-179, July 2009.

B. Aliaj and J. J. Liou, "Self-protection capability of integrated NLDMOS power arrays in ESD pulse regimes," Microelectronics Reliability, vol. 51, pp. 2015-2030, Dec. 2011.

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f) Other Publications

J. J. Liou and C. C. Lee (editors), ***Proceedings of Third Annual Conference of Chinese -American Scholars Association of Florida***, June 19-21, 1992, Miami, Florida.

J. J. Liou (editor), ***Newsletter of the Chinese-American Association of Central Florida***, 1993-1994.

Invited Tutorials/Seminars/Presentations

1. "Current status and future trend of AlGaAs/GaAs HBTs," National Taiwan University, Taipei, Taiwan, 1991.
2. "Modeling the AlGaAs/GaAs HBT with a graded base layer," National Chiao-Tong University, Taipei, Taiwan, 1992.
3. "Testing model for bipolar junction transistors," IBM, Boca Raton, Florida, 1993.
4. "Neural networks: its design and applications," Harris Semiconductor Corp., Melbourne, Florida, 1993.
5. "Modeling and simulation of AlGaAs/GaAs HBTs," Wright Lab., Wright-Patterson Air Force Base, Ohio, 1993.
6. "Optimization of CMOS process," AT&T Microelectronics, Orlando, Florida, 1993.
7. "Thermal effects on the performance of power AlGaAs/GaAs HBTs," Sharp Corporation, Nara, Japan, 1993.
8. "AlGaAs/GaAs HBTs: an overview," National Cheng-Kung University, Tainan, Taiwan, 1994.
9. "Leakage currents of AlGaAs/GaAs HBTs," National Central University, Taipei, Taiwan, 1994.
10. "Advanced semiconductor device physics and modeling," National Singapore University, Singapore, 1995.
11. "Semiconductor device physics: an overview," Technical University Ilmenau, Ilmenau, Germany, 1995.
12. "Two-dimensional simulation of AlGaAs/GaAs HBTs," Tsinghua University, Beijing, China, 1995.
13. "Device physics and modeling of CMOS," MOSEL Semiconductor, Taipei, Taiwan, 1995.
14. "MOSFET parameter extraction based on two-dimensional device simulation," AT&T Microelectronics, Orlando, 1995.
15. "MOSFET simulation using device simulator," IEEE Hong Kong Electron Device Society Meeting, Hong Kong, Jan. 28, 1997.
16. "Computer-aided design for microelectronics: an overview," National Yunlin University of Science & Technology, Taiwan, Dec. 1998.
17. "Reliability of AlGaAs/GaAs HBTs," Hitachi Corp., Tokyo, Japan, June 1999.
18. "Research activities in microelectronics at University of Central Florida," Tsinghua University, Beijing, China, April 1999.
19. "Research activities in microelectronics at University of Central Florida," Fudan University, Shanghai, China, April 1999.
20. "Device simulation and parameter extraction of MOSFETs," Silicon Manufacturing

Partners, Singapore, July 1999.

21. "Research activities in microelectronics at University of Central Florida," United Silicon Integrated Corp., Taiwan, June 1999.
22. "Reliability of AlGaAs/GaAs HBTs: modeling and characterization," Thomson-CSF Corp, Paris, France, Nov. 1999.
23. "Computer-aided design for microelectronics devices and ICs," National Chi Nan University, Taiwan, June 2000.
24. "Statistical modeling of MOS devices and ICs," National Taiwan University, Taiwan, June 2000.
25. "Simulation and parameter extraction of semiconductor devices," Chongqing University, Chongqing, China, June 2000.
26. "Electrostatic discharge in semiconductor devices: improved measurement technique and SPICE modeling," Conexant Systems, Inc., Oct. 2000.
27. "Overview of electrostatic discharge in microchips," IEEE Singapore Section, Singapore, Jan. 2001.
28. "Evolution and current status of RF/microwave semiconductor devices," IEEE Hong Kong Section, Jan. 2001.
29. "Evolution and current status of RF/microwave semiconductor devices," Nanjing University, Nanjing, China, Jan. 2001.
30. "Evolution and current status of RF/microwave semiconductor devices," Huazhong University of Science & Technology, Wuhan, China, Jan. 2001.
31. "Overview of RF/microwave semiconductor devices and applications," Tsinghua University, Beijing, China, May 2001.
32. "Electrostatic discharge protection for RF microchips," Intel Corp., Sacramento, CA, Aug. 2001.
33. "Progress in RF semiconductor devices," Conexant Systems, Inc., Orange County, CA, Aug. 2001.
34. "RF transistors and circuits: a historical prospect," IEEE Korea Section, Seoul, Korea, Sept. 2001.
35. "SPICE modeling of electrostatic discharge (ESD) in microchips," University of Nevada, Las Vegas, NV, Oct. 2001.
36. "Recent advances in RF semiconductor devices," University degli Studi di Rome, Rome, Italy, Nov. 2001.
37. "Reliability of AlGaAs/GaAs and InGaP/GaAs heterojunction bipolar transistors," IBM, Fishkill, NY, Dec. 2001.
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   "Overview of modern transistors for RF applications," IEEE Orlando Section, Orlando, Florida, April 2003.
   "Modeling of junction field-effect transistors for computer-aided design," Semiconductor

Research Corp., Raleigh, North Carolina, June 2003.

"Electrostatic discharge (ESD) protection for microchips," IEEE Orlando Section, Orlando, Florida, Sept. 2003.

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"Evolution and recent advances in RF transistors," IEEE Switzerland Section, Zurich, Switzerland, Oct. 2003.

"RF CMOS: recent advances and future applications," Promos Corporation, Hsinchu, Taiwan, Oct. 2003.

"Evolution and recent advances in RF transistors," IEEE Mexico Section, Mexico City, Mexico, Nov. 2003.

"RF CMOS: recent advances and future applications," IEEE Venezuela Section, Caracas, Venezuela, Feb. 2004.

"High-speed semiconductor devices: an overview," National Cheng Kung University, Tainan, Taiwan, June 2004.

"On-chip spiral inductor for RF applications," IEEE Singapore Section, Singapore, July 2004.

"Overview of recent progress in RF transistors," IEEE Vancouver ED Chapter, Vancouver, Canada, Sept. 2004.

"On-chip spiral inductors for RF applications," IEEE Hong Kong ED Chapter, Hong Kong, Jan. 2005.

"Reliability modeling of MOS devices and circuits," Taiwan Semiconductor Manufacturing Co., Hsinchu, Taiwan, June 2005.

"Modeling of spiral inductor for RF applications," Freescale Semiconductor, Phoenix, AZ, Aug. 2005.

"Spiral inductors for RF applications," Peking University, Beijing, China, Dec. 2005.

"Recent progress in RF CMOS," University of Calgary, Calgary, Canada, Sept. 2006.

"Electrostatic discharge protection in CMOS technology," Simon Fraser University, Vancouver, Canada, Sept. 2006.

"Electrostatic discharge protection in CMOS technology," Samsung, Seoul, Korea, April 2007.

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"Model development of junction field-effect transistors," National Semiconductor, San Jose, CA, Dec. 2007.

"ESD protection based on silicon controlled rectifier," IBM, Fishkill, NY, Dec. 2007.

"Recent advances in RF electronics," Panasonic Research Center, Osaka, Japan, Mar. 2008.

"Compact modeling for ESD applications," IMEC, Brussels, Belgium, Oct. 2008.

"Electrostatic discharge protection solutions in Si nanowire technology," Seoul National University, Seoul, Korea, April 2009.

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Beijing, China, May 2009.

"Electrostatic discharge protection solutions for low-voltage IC's," National Semiconductor, San Jose, CA, July 2009.

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"ESD protection solutions in CMOS technology," Imperial College, London, UK, Jan. 2010.

"ESD protection solutions for modern and future integrated circuits," China Academic of Science, Beijing, China, May 2010.

"ESD protection solutions for modern and future integrated circuits," Qingdao University, Qingdao, China, May 2010.

"Design, Characterization and modeling of ESD protection solutions in CMOS technology," Global Foundries, Singapore, Nov. 2010.

"Challenges in ESD protection for emerging organic technology," University of Tokyo, Tokyo, Japan, Jan. 2011.

"Outlook and challenges of electrostatic discharge protection of modern and future integrated circuits," University of California Berkeley, Berkeley, CA, April, 2011.

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