Peng Sun

Office: Engineering Building 327, Department of Electrical and Computer Engineering
University of New Mexico, Albuquerque, NM 87131
505-277-1085 pengsun@eece.unm.edu
Home: 931 Buena Vista Dr. SE APT D111, Albuquerque, NM 87106
505-400-0335

ACADEMIC PREPARATION:

Ph.D. in Electrical Engineering
University of New Mexico, Albuquerque, NM Expected May 2007
Concentrations: Communication Theory, Signal Processing
Dissertation: *Mathematical Theory of Modern Avalanche Photodiodes and Its Application to Ultra fast Communications*
Advisor: Dr. Majeed M. Hayat

M.S. in Statistics
University of New Mexico, Harbin, Albuquerque, NM December 2006
Concentrations: Stochastic Process, Computational Statistics
Advisor: Dr. Ronald Christensen

B.S. in Electrical Engineering
Harbin Institute of Technology, Harbin, HLJ, P. R. China June 1998
Concentrations: Power System and Its Automation

CURRENT RESEARCH INTERESTS:

Optical Communication, Signal Processing, Applied Probability and Stochastic Processes, Semiconductor device modeling, Device simulation and characterization., Support vector machine and its applications.

PROFESSIONAL EXPERIENCE:

Research Assistant, 2003-Present
Department of Electrical Engineering
University of New Mexico, Albuquerque, NM 87106

- Developed a novel theory to characterize the multiplication process in the thin GaAs, InGaAs, InP and other APDs used as the high-speed optical receiver.
- Solved the complete statistical properties of gain and buildup time of the avalanche photodiode for the first time. Proposed a randomized-parameter model

for the multiplication process.
- Built a stochastic model that fully characterizes the high-speed optical receiver. Demonstrated the usage of this model in analyzing the receiver performance and designing noise-cancellation methods.
- Simulated and analyzed the ultrafast fiber optical transmission system, measured the receiver performance at ultrafast transmission rate.
- Designed signal processing techniques for equalizing the random channel dispersion, inter-symbol interference exhibited by APD-based optical receiver.
- Implemented equalization techniques for APD-based integrate and dump receiver to realize stable optical communication up to 40Gbps.

Technical Consultant 1998-2000

HARBIN SHIRBLE ELECTRIC-HEAT CO., LTD
Harbin, Heilongjiang, P. R. China
- Provided technical support for energy-handling electric circuits and electromechanical equipments in the power plant
- Participated in project planning, analyzing the plant and equipment needs

TEACHING EXPERIENCES

Instructor 2006
Department of Electrical and Computer Engineering, University of New Mexico

COURSE TAUGHT

Signals and Systems
Digital Communications (on selected topics)
Optical Communications (on selected topics)
Detection and Estimation Theory (on selected topics)

SKILLS:

- Numerical Analysis, Modeling and Simulating, Parallel Computing
- Proficient in Matlab, Simulink, Maple, Mathematica, Labview, Fortran, C/C++

LANGUAGES:

- Native Fluency in Chinese and Fluency in English

PUBLICATIONS:

P. Sun, M. M. Hayat, "Equalized APD-based receiver for ultrafast optical communication system " Proc. SPIE Vol. 6368 Oct. 2006

P. Sun, M. M. Hayat, B. E. A. Saleh, and M. C. Teich, "Statistical correlation of gain and buildup time in APDs and its effects on receiver performance," *IEEE/OSA J. Lightwave Technology*, 2006

P. Sun and M. M. Hayat, "A Linear Equalizer for High-Speed APD-Based Integrate-and-dump Receivers," *IEEE Communications Lett*., Dec. 2005

P. Sun, M. M. Hayat, J. C. Campbell, B. E. A. Saleh, and M. C. Teich, "Correlation between Gain and Buildup-Time Fluctuations in Ultrafast Avalanche Photodiodes and Its Effect on Receiver Sensitivity," *IEEE/OSA* 2005 OFC/NFOEC Meeting, Anaheim, CA, Mar., 2005

Kwon, **P. Sun**, M. M. Hayat, J. C. Campbell, B. E. A. Saleh, and M. C. Teich, "EnhancedGain-Bandwidth Product and Performance in Thin Heterostructure Avalanche Photodiodes," *IEEE-LEOS 2003: High-Speed Photodetectors*, Tucson, AZ, vol. 2, pp. 997-998, Nov., 2003

PROFESSIONAL MEMBERSHIPS:

IEEE and IEEE Society of Communications
SPIE the International Society for Optical Engineering

COMMUNITY SERVICES

Science fair judge at Queen of Heaven Elementary School, Albuquerque, NM 2006
Vice president of UNM Chinese Student Friendship Association 2003-2004