PUNEET GUPTA

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EDUCATION

University of Maryland (UMD) August 2000 - May 2002 College Park, MD
MS, Electrical and Computer Eng. GPA: 3.88/4.00 Major: Signal Processing and Communications

Indian Institute of Technology (IITD) July 1996 - May 2000 New Delhi, India
Bachelor of Technology, Electrical Eng. GPA: 8.95/10.00 Among top 5% in class

CAREER SUMMARY

Telogy Networks, a Texas Instruments (TI) company June 2002 - present Germantown, MD
Software Design Engineer, Echo Cancellation Technology Group
Design, implementation and testing of acoustic echo cancellation software for Voice over IP

Center for Automation Research, UMD August 2000 - May 2002 College Park, MD
Research Assistant, Language and Media Processing Laboratory
Development and evaluation of an automated system for classification of silicon wafer defects

Hughes Research Laboratories (HRL) May 2001 - August 2001 Malibu, CA
Summer Intern, Information Sciences Laboratory
Conceptualization and implementation of an end-to-end video surveillance system for intruder detection

Analog Devices India, Inc. May 1999 - July 1999 Bangalore, India
Summer Intern, DSP Core Development and Testing Group
Drafting of test cases and white-box testing of SDRAM interface of SHARC DSP processor

WORK EXPERIENCE

- **Phone and Media Processing** (Voice over IP Group, Telogy Networks)
  Software Development and Integration
  - Designed and implemented state-of-the-art Acoustic Echo Cancellation (AEC) software – Echo Canceller (full duplex solution) and Echo Suppressor (half duplex solution)
  - Lead engineer for finite state machine modeling of AEC for design enhancements and for introduction of new features such as noise guard and high level compensation
  - Technical lead for integration of AEC and AGC for all software releases
  - Developed an Automatic Gain Control (AGC) unit to adaptively monitor and control DSP system gains
  - Principal architect for design and development of a bidirectional signal equalizer for IP Phone (IPP) and Wireless LAN IPP (WIPP) applications
  - Designed and implemented a comprehensive band-splitting approach for wideband AEC operation
  - Lead engineer for AEC and AGC related special engineering releases to customers

  Testing, Calibration and Training
  - Coordinated complete unit testing, black-box testing and white-box testing of AEC and AGC
  - Trained test engineers in calibration of AEC and AGC software, and testing for compliance with benchmark industry standards like G.167
  - Contributed new test tools for AEC convergence analysis and echo path estimation; developed a complete set up for narrow-band and wide-band testing of IPP enclosures and software
  - Responsible for comprehensive evaluation of noise characteristics of the analog codec on TI's Titan chip
  - Principal engineer for customer training and workshops on AEC/AGC for Voice over IP applications
  - Team member for qualitative and quantitative evaluation of transducers and enclosure designs for TI's IPP
- **Image Processing** (UMD, IITD)
  - Proposed and developed an automated industry solution for robust pattern recognition and classification of semiconductor defects (using classifiers such as discriminant analysis and support vector machines)
  - Designed and implemented a novel smart-beam-search algorithm for feature selection in pattern classification

- Proposed and implemented an innovative scheme for automated segmentation and script identification of electronic document images
- Developed a novel content-based retrieval engine for electronic document images
- Implemented and evaluated various algorithms for face-recognition, digital watermarking, texture-segmentation and geometric correction of images

- **Speech and Video Processing** (HRL, UMD)
  - Formulated, designed and developed an intelligent video surveillance system for intruder detection under non-stationary ambient conditions
  - Formulated, implemented and evaluated a speaker-independent digit recognition system
  - Conducted in-depth analysis of different algorithms for speech recognition in noisy telephony environments; made recommendations for enhancing algorithm performance
  - Analyzed and evaluated different feature extraction schemes as front-ends to Hidden Markov Modeling based speech recognition systems
  - Implemented and evaluated algorithms for estimation of structure from motion and video mosaicing
- **Communication Theory/Systems** (UMD, IITD)
  - Implementation and validation of the Viterbi decoder and trellis-coded modulation encoder/decoder
  - Circuit realization for direct sequence spread spectrum modulation and demodulation
  - Development, fabrication and evaluation of a novel design for fiber array blocks used in optical networks

SKILL SET

• Programming Languages	C/C++, Visual C++, Pascal; familiarity with SQL, VHDL, HTML
• Operating Systems	VxWorks (RTOS), Windows'2000/XP, DOS, UNIX, Linux
• Processors	TNETV1050 (Titan), TMS320C5472 (Orion), TMS320C5409, TMS320C5510; Analog Devices ADSP-21161 (Hammerhead); Intel 8086, 8085
• Standards, Protocols and Recommendations	ITU-T: P.340, P.341, G.167, G.161, G.711, G.722; ETSI: IETS 300.245.2-6; TIA/EIA 810A, 920; MPEG, JPEG 2000, RFC1889, IEEE 802.11, ISO-9000
• Tools and Software	Rational ClearCase, Rational ClearQuest, eXpressDSP Code Composer Studio, MATLAB, XWaves, Cool Edit Pro, Network Monitor, MS Office, LaTEX, Windows Media Player/Encoder SDK, MS Visio, MS FrontPage

PUBLICATIONS AND PATENTS

- "*Smart Beam Search for Effective Feature Selection in SVM Automatic Defect Classification*," International Conference on Pattern Recognition, 2002, Quebec City, Canada
- "*A Model Guided Document Image Analysis Scheme*," International Conference on Document Analysis and Recognition, 2001, Seattle, USA
- "*Wavelet based page segmentation*," Proceedings of International Conference on Vision, Graphics and Image Processing (ICVGIP), 2000, Bangalore, India. Awarded *Best Technical Paper Award*.
- "*Preparation and Evaluation of Optical Fiber Array Blocks*," Photonics, 1998, Delhi, India
- Patent for "*Design and Fabrication Methodology for Optical Fiber Array Blocks*", 1998

HONORS AND AWARDS

- *Best Undergraduate Research Project*, Electrical Engineering Department, IITD (1999 - 2000)
- *Students' Undergraduate Research Award*, Electrical Engineering Department, IITD (1998 - 1999)
- *Jawahar Lal Nehru Memorial Scholarship* for academic excellence at IITD (1999 – 2000)
- *Merit Scholarship* from Ramanujan Society of Born Mathematicians (1996 - 1997)
- *Merit Scholarships* for outstanding performance in Junior Science Talent Search (1993 - 1995)
- *Mathematics Wizard Award* for excellence in Mathematics Talent Search (1990 - 1992)

EXTRACURRICULAR ACTIVITIES

- Volunteer for publicity and fundraising activities of non-governmental organizations working for the welfare of under-privileged in India, 1999 – present
- Coordinator and supervisor for technical and cultural campus events at UMD and IITD, 1997 - 2002

- Executive coordinator of Social Maladies Committee of the National Service Scheme, India, 1997 - 1998
- Volunteer for adult and children literacy programs and other community welfare efforts, 1996 – 2000

HOBBIES

- Painting, traveling, reading, listening to music, theater, badminton