

Trista Pei-chun Chen

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- EXPERIENCE**
- NVIDIA Corporation**, Santa Clara, CA Aug 2003~Sept 2004
Architecture Lead, NV4x Video Processor (VP)
- Designing video processor (VP) for the next-generation graphics hardware
 - VP is a programmable unit inside the graphics hardware that performs advanced video algorithms such as MPEG-x decoding.
 - Designing and studying future media processor that integrates graphics, video, and vision
 - Validating and testing the video processor
- Carnegie Mellon University**, Pittsburgh, PA Aug 1999~July 2003
Research Assistant, Electrical and Computer Engineering
- Conducted research and developed “Networked Video Systems with Statistical Approaches: Rate Shaping, Error Concealment, and Traffic Modeling”
 - Conducted research and developed “Optimal Blind Watermark Detector” and “Progressive Watermark” for streaming media
 - Developed the face authentication module in the project “Multi-model Person Authentication Interface”. I built a biometric signal processing toolbox (API).
- Teaching Assistant*, Electrical and Computer Engineering, “Signals and Systems” course
- Sony Electronics, Inc.**, Pittsburgh, PA June 2001~Aug 2001
Intern, Pittsburgh Sony Design Center
- Designed and tested circuits of Video Watermark (VWM) for the next-generation DVD recorder, which is the first watermark chip in the world.
- Hewlett-Packard Company**, Cambridge, MA May 2000~Aug 2000
Research Intern, Cambridge Research Lab
- Designed “System and Method for Efficiently Finding Near-Similar Images in Massive Databases” (<http://www.crl.hpl.com/vision/multimedia/similarity/default.htm>). We proposed “minutia” based feature extraction and locality-sensitive-hashing (LSH) based smart searching to find near-similar images in a robust and quick manner.
- Startek Engineering Inc.**, Hsinchu, Taiwan July 1998~June 1999
R&D Software Engineer, R&D Department
- Standardized Startek’s fingerprint identification modules to HAAPI (Human Authentication API) and BAPI (Biometric API)
 - Developed a new fingerprint identification algorithm based on directional Fourier filters
- National Tsing Hua University**, Hsinchu, Taiwan Sept 1997~June 1999
Research Assistant, Electrical Engineering
Mentor, Electrical Engineering, “Undergraduate Research” course for the project “Digital Image Watermark”. The project was ranked No. 1 in the class
Teaching Assistant, Electrical Engineering, “Computer Architecture” and “Lab of Electrical Circuits” courses
- EDUCATION**
- Carnegie Mellon University**, Pittsburgh, PA May 2003
Ph.D. in Electrical and Computer Engineering, Advisor: Prof. Tsuhan Chen
- Thesis: “Error-Resilient Rate Shaping for Video Streaming over Packet-Loss Networks”
- National Tsing Hua University**, Hsinchu, Taiwan June 1999
Master of Science in Electrical Engineering, Advisor: Prof. Wen-Hsing Hsu
- Thesis: “Modeling, Performance Analysis, and Applications of Digital Image Watermarking Systems”
- Bachelor of Science in Physics/Electrical Engineering June 1997

COMPUTER SKILLS	C/C++ Java Verilog	DirectX Perl Windows/Dos	MFC Matlab Unix/Linux
RELEVANT COURSES	Signals and Systems Digital Signal Processing Stochastic Processes Pattern Recognition Digital Image Processing	Digital Video Processing Optical Imaging and Radar Processing Multimedia Communications Communication Theory Error Correction Coding	Packet and Circuit Switching QoS for Networked Computer Systems Introduction to NII Computer Security Algorithms in the Real World
HONORS	<ul style="list-style-type: none"> • Institute of Information and Computing Machinery (ICM) Best Thesis Award 1999 • Ministry of Education of Taiwan Scholarship for Gifted Students studying Mathematics and Natural Science 1993-1997 • Dr. Shih-Chin Chang's Scholarship for Students with Outstanding Performance in Experimental Physics 1995 • Taiwan National Physics Exam Award for Physics-majored College Students 1995 		
INVITED TALKS	<ul style="list-style-type: none"> • "Signal Modeling for Video, Vision, and Graphics", Intel Research Lab, Santa Clara, NY, July 12, 2004 • "Multimedia Streaming and Security: Error-Resilient Rate Shaping", IBM Research, Hawthorne, NY, June 09, 2003 • "Signal Analysis for Multimedia Security and Streaming", Intel Corporation, Santa Clara, CA, May 23, 2003 • "Rate Shaping for Video Multicasting", Computer Science Department, Carnegie Mellon University, Pittsburgh, PA, April 11, 2003 • "Streaming Media over Wireless Networks", Center for Wireless and Broadband Networking (CWBN) Annual Spring Review, Carnegie Mellon University, Pittsburgh, PA, April 8, 2003 • "Error Resilient Video Streaming with Rate Shaping", ADVENT Seminar, Columbia University, New York, NY, February 7, 2003 • "Cross-Layer Optimization for Wireless Video Streaming" <ul style="list-style-type: none"> o Department of Electrical and Computer Engineering, University of California, Davis, CA, January 10, 2003 o Signal and Image Processing Institute, University of Southern California, Los Angeles, CA, January 6, 2003 • "Fine-Grained Rate Shaping for Video Streaming", Center for Wireless and Broadband Networking (CWBN) Seminar, Carnegie Mellon University, Pittsburgh, PA, October 29, 2002 • "Life after Video Coding Standards: Rate Shaping and Error Concealment" <ul style="list-style-type: none"> o Institute of Information Science, Academic Sinica, Taipei, Taiwan, March 18, 2002 o Video Signal Processing Lab, National Tsing Hua University, Hsinchu, Taiwan, March 14, 2002 o Computer Vision Lab, National Chiao Tung University, Hsinchu, Taiwan, March 14, 2002 • "Progressive and Scalable Watermarking", HP Cambridge Research Lab, Cambridge, MA, June 2000 		
ACTIVITIES AND MEMBERSHIPS	<ul style="list-style-type: none"> • Technical Program Committee Member: 2003 IEEE International Conference on Multimedia & Expo (ICME 2003) • International Program Committee Member: EuroIMSA 2005 • Reviewer: <ul style="list-style-type: none"> o IEEE Transactions on Multimedia o IEEE Transactions on Image Processing o IEEE Transactions on Circuits and Systems for Video Technology o EURASIP Signal Processing: Image Communication o EURASIP Journal on Applied Signal Processing o IEEE international conferences: ISCAS 2001, ICIP 2002, WCNC 2003, ICC 2003, ISCAS 		

2003, ICME 2003, ICIP 2003, ICICS-PCM 2003, ICC 2004, ISCAS 2004, VTC'F04, GlobalCom'04

- Member: IEEE
- Member: Institute of Information and Computing Machinery (IICM)
- Web Administrator: Advanced Multimedia Processing (AMP) Lab, Carnegie Mellon University
- Vice President: Hsinchu Alumni Association, National Tsing Hua University

PUBLICATIONS *Journal Papers and Technical Reports*

- “Adaptive Probabilistic Principal Component Analysis”, T. P.-C. Chen and T. Chen, prepared for submission to *IEEE Signal Processing Letters*, September 2004.
- “Error-Resilient Rate Shaping for Video Streaming over Packet-Loss Networks”, T. P.-C. Chen and T. Chen, prepared for submission to *IEEE Transactions on Multimedia*, September 2004.
- “Fine-Grained Rate Shaping for Video Streaming over Wireless Networks”, T. P.-C. Chen and T. Chen, *EURASIP Journal on Applied Signal Processing*, Special Issue on Multimedia over IP and Wireless Networks, 2004, pp. 176-191.
- “Error Concealment Aware Rate Shaping for Wireless Video Transport”, T. P.-C. Chen and T. Chen, *EURASIP Signal Processing: Image Communication*, Special Issue on Recent Advances in Wireless Video, 2003, pp. 889-905
- “Second-Generation Error Concealment for Video Transport over Error Prone Channels”, T. P.-C. Chen and T. Chen, *Wireless Communications and Mobile Computing*, Special Issue on Multimedia over Mobile IP, October 2002.
- “A Framework for Optimal Public Watermark Detection”, T. P.-C. Chen and T. Chen, *Carnegie Mellon University Technical Report AMP01-03*, Sept. 2001.
- Invited paper: “A Digital Image Watermarking System: Modeling, Performance Analysis, and Application”, T. P.-C. Chen, Y.-S. Chen, and W.-H. Hsu, *Journal of Computers*, March 2001.

Conference Papers

- “Incorporating Digital Typography With Handwriting Styles”, L.-Y. Wei, W.-C. Chen, and T. P.-C. Chen, prepared for submission to SIGGRAPH 2005.
- “Rate Shaping for Video with Frame Dependency”, T. P.-C. Chen and T. Chen, to appear in *ICME 2003*, Baltimore, MD, July 2003.
- “Error Concealment Aware Rate Shaping for Wireless Video Transport”, T. P.-C. Chen and T. Chen, *Packet Video 2003*, Nantes, France, April 2003.
- “Fine-Grained Rate Shaping for Video Streaming over Wireless Networks”, T. P.-C. Chen and T. Chen, *ICASSP 2003*, Hong Kong, China, April 2003.
- “Second-Generation Error Concealment for Video Transport over Error-Prone Channels”, T. P.-C. Chen and T. Chen, *ICIP 2002*, Rochester, NY, September 2002.
- “Updating Mixture of Principal Components for Error Concealment”, T. P.-C. Chen and T. Chen, *ICIP 2002*, Rochester, NY, September 2002.
- “Adaptive Joint Source-Channel Coding using Rate Shaping”, T. P.-C. Chen and T. Chen, *ICASSP 2002*, Orlando, FL, May 2002.
- “Markov Modulated Punctured Autoregressive Processes for Video Traffic and Wireless Channel Modeling”, T. P.-C. Chen and T. Chen, *Packet Video 2002*, Pittsburgh, PA, April 2002.
- Invited paper: “Life after Video Coding Standards: Rate Shaping and Error Concealment”, T. P.-C. Chen, T. Chen, and Y.-F. Hsu, *Visual Information System 2002*, Hsinchu, Taiwan, March 2002.
- “A Framework for Optimal Blind Watermark Detection”, T. P.-C. Chen and T. Chen, *ACM Multimedia 2001 Workshop on Multimedia and Security: New Challenges*, Ottawa, Canada, Oct 2001.
- “Progressive Image Watermarking”, T. P.-C. Chen and T. Chen, *ICME 2000*, New York, NY, July 2000.
- “Modeling, performance analysis, and applications of digital image watermarking systems”, T. P.-C. Chen, W.-H. Hsu, and Y.-S. Chen, *1999 12th IPPR Conference on Computer Vision, Graphics and Image Processing (CVGIP'99)*, Taipei, Taiwan, August 1999.
- “A Communication System Model for Digital Image Watermarking Problems”, T. P.-C. Chen, Y.-S. Chen, and W.-H. Hsu, *World Multiconference on Systems, Cybernetic, and Informatics (ISAS'99)*, Orlando, FL, July 1999.
- “Adaptive-Rate Image Watermarking based on Spread Spectrum Communication Technique”, T. P.-C. Chen, Y.-S. Chen, and W.-H. Hsu, *3rd World Multiconference on Circuits, Systems, Communications and Computers (CSCC'99)*, Athens, Greece, July 1999.

Patents

- “Method for Video Error Concealment by Updating Statistics”, T. Chen, T. P.-C. Chen and Y.-F. Hsu, applying for *U.S. and Taiwan patents*, October 2002.
- “System and Method for Efficiently Finding Near-Similar Images in Massive Databases”, T. P. Chen, T. M. Murali (now at Boston University), and R. Sukthankar (now at Intel Research Pittsburgh), filed for *U.S. Patent: 10/005,193*, December 2001.

Thesis

- Ph.D. Thesis: “Error-Resilient Rate Shaping for Video Streaming over Packet-Loss Networks”, May 2003.
- M.S. Thesis: “Modeling, Performance Analysis, and Applications of Digital Image Watermarking Systems”, May 1999, awarded 1999 IICM Best Thesis Award.

(Reprints and preprints can be accessed from <http://www.andrew.cmu.edu/~peichun/Publications.htm>)