

Wei-Chao Chen, Ph.D.

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Education

- 05/2001 - 07/2002 Ph.D. in Computer Science, advised by Dr. Henry Fuchs
Thesis: “*Light Field Mapping: Efficient Representation of Surface Light Fields*”.
Department of Computer Science, University of North Carolina at Chapel Hill
- 08/1998 – 05/2001 M.S. in Computer Science
Department of Computer Science, University of North Carolina at Chapel Hill
- 09/1994 - 07/1996 M.S. in Electrical Engineering
Thesis: “*Relativistic Computer Graphics for Accelerated Scenes and Objects*”.
Department of Electrical Engineering, National Taiwan University, Taiwan
- 09/1990 – 07/1994 B.S. in Electrical Engineering
Department of Electrical Engineering, National Taiwan University, Taiwan

Experiences

- 02/2007 - Present Member of Research Staff
Visual Computing and Ubiquitous Imaging Group
Nokia Research Center, Palo Alto, California, U.S.A.
Research on computer graphics, computer vision and user interaction techniques.
- 08/2002 - 12/2006 3D Graphics Architect
Architecture Group
nVidia Corporation, Santa Clara, California, U.S.A.
High-level design and testing of next-generation graphics processors (GPU):
 - *Architect, NV34 (GeForce 5200)*
 - *Shader Architecture Lead, NV41/NV43 (GeForce 6600 series).*
 - *Shader Architecture Lead, G70 (GeForce 7800 series)*
 - *Shader/Texture Architecture Lead, Sony Playstation 3 Rendering Subsystem.*
 - *Next-generation GPU designs (project undisclosed).*
- Fall 2001 –
Spring 2002 Consultant
Visual Interactivity Group, Microprocessor Research Lab
Intel Corp., Santa Clara, California, U.S.A.
Work on Open-Source Light Field Mapping and its MPEG4 Standardization.
- Summer 2001 Course Instructor: “COMP14-91: Introduction to Programming”
Department of Computer Science, University of North Carolina at Chapel Hill
Prepared and taught a full-semester undergraduate summer course.
- Summer 2000 Internship on Photorealistic 3D Modeling
Visual Interactivity Group, Microprocessor Research Lab
Intel Corp., Santa Clara, California, U.S.A.
Started development of Light Field Mapping technology, an efficient representation for image-based models. My dissertation topic is partly based on the research started here.
- 08/1998 – 05/2001 Research Assistant

Office of the Future/Teleimmersion Project (under Dr. Henry Fuchs)
Department of Computer Science
University of North Carolina at Chapel Hill

Research on Immersive Displays, Augmented Reality and Teleimmersion. I am the primary UNC-CH contributor to the "National Teleimmersion Initiative", a joint effort by UNC-CH, Brown University, University of Pennsylvania, and Advanced Network Services. This work is featured in department recruit poster and "Scientific American", among others.

08/1996 – 05/1998

Army Infantry (Obligatory Army Service), Taiwan

08/1993 – 07/1996

Research Assistant

Archi Group (under Dr. Feipei Lai)

Department of Electrical Engineering, National Taiwan University

Publications

1. JOURNAL & CONFERENCE PAPERS:

- ◆ Gabriel Takacs, Vijay Chandrasekhar, Natasha Gelfand, Yingen Xiong, **Wei-Chao Chen**, Thanos Bismipiannis, Radek Grzeszczuk, Kari Pulli and Bernd Girod. "*Outdoors Augmented Reality on Mobile Phone using Loxel-Based Visual Feature Organization*", ACM International Conference on Multimedia Information Retrieval, Oct. 2008
- ◆ **Wei-Chao Chen**, Yingen Xiong, Jiang Gao, Natasha Gelfand and Radek Grzeszczuk. "*Efficient Extraction of Robust Image Features on Mobile Devices*", International Symposium on Mixed and Augmented Reality, Nov. 2007
- ◆ Tianli Yu, Hongcheng Wang, Narendra Ahuja, **Wei-Chao Chen**. "*Sparse Lumigraph Relighting by Illumination and Reflectance Estimation from Multi-View Images*", in Eurographics Symposium on Rendering (EGSR 2006), June 2006.
- ◆ Tianli Yu, Narendra Ahuja, **Wei-Chao Chen**. "*3D Reconstruction of Non-lambertian Objects Using Graph Cuts on Surface Distance Grid*", to appear in IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), June 2006.
- ◆ Herman Towles, **Wei-Chao Chen**, Ruigang Yang, Sang-Uok Kum, Henry Fuchs, Nikhil Kelshikar, Jane Mulligan, Kostas Daniilidis, Loring Holden, Bob Zeleznik, Amela Sadagic and Jaron Lanier. "*3D Tele-Immersion Over Internet2*", in International Workshop on Immersive Telepresence (ITP2002), Dec. 2002.
- ◆ **Wei-Chao Chen**, Jean-Yves Bouguet, Michael Chu and Radek Grzeszczuk. "*Light Field Mapping: Efficient Representation and Hardware Rendering of Surface Light Field*", in ACM SIGGRAPH 2002 (also in ACM Transactions on Graphics, 21:3, July 2002).
- ◆ **Wei-Chao Chen**, Herman Towles, Lars Nyland, Greg Welch and Henry Fuchs. "*Toward a Compelling Sensation of Telepresence: Demonstrating a Portal to a Distant (Static) Office*", IEEE Visualization, Oct 2000.
- ◆ Ramesh Raskar, Greg Welch and **Wei-Chao Chen**. "*Table-top Spatially Augmented Reality: Bringing Physical Models to Life using Projected Imagery*", Second Int. Workshop on Augmented Reality (IWAR '99), Oct. 1999.
- ◆ Ramesh Raskar, Michael Brown, Ruigang Yang, **Wei-Chao Chen**, Greg Welch, Herman Towles, Brent Seales and Henry Fuchs. "*Multiprojector Displays using Camera-based Registration*", IEEE Visualization, Oct. 1999.
- ◆ Meng-Chou Chang, Feipei Lai and **Wei-Chao Chen**. "Image Shading Taking into Account Relativistic Effects", in ACM Transactions on Graphics, 15:4, Oct. 1996.

2. PATENTS & STANDARDS:

- ◆ "*Shared Eraser: Smart Photo Editing by Leveraging Large Online Photo Collections*", with Natasha

Gelfand and Kari Pulli, USA Patent Pending, 2008

- ◆ “An Interface for Viewing Photo Bursts and Stacks”, with Natasha Gelfand, Kari Pulli and Marc Levoy, USA Patent Pending, 2008
- ◆ “Fast and Efficient Mobile Visual Search”, with Yingen Xiong, Xianglin Wang, Jiang Gao, Radek Grzeszczuk, Natasha Gelfand, Philipp Schloter, Kari Pulli and Matthias Jacob, USA Patent Pending, 2007
- ◆ “Visual Search Interface”, with Natasha Gelfand, Radek Grzeszczuk, Yingen Xiong, USA Patent Pending, 2007
- ◆ “A Method and System for Processing Texture Samples with Programmable Filter Weights”, with Li-Yi Wei, USA Patent Pending, USA Patent Pending, 2007
- ◆ “Improving a Graphical Shader by Using Delay”, with Emmett Kilgariff, Rui Bastos and Douglas Hahn, USA Patent Pending (P001559), 2005
- ◆ “Divergent and Non-Divergent Texture Fetches”, with Christian Rouet, Emmett Kilgariff, Rui Bastos, USA Patent Pending (P001560), 2005
- ◆ “Compaction of Z-only Samples”, with Jonah Alben, Anjana Rajendran, USA Patent Pending (P001561), 2005
- ◆ “Dynamic Texture Fetch Cancellation”, with Mark Kilgard, Rui Bastos, Johnny Rhodes, Cass Everitt, USA Patent Pending (P001664), 2005
- ◆ “Standard Support for Progressive Encoding, Compression and Interactive Visualization of Surface Light Fields”, with R. Grzeszczuk, S. Molinov, A. Smirnov, MPEG4 Standard Proposal (accepted), 2002.
- ◆ “Hardware-Accelerated Visualization of Surface Light Fields”, with R. Grzeszczuk, J.-Y. Bouguet, USA Patent 6,677,957, issued January 2004.
- ◆ “Compression of Surface Light Fields”, with R. Grzeszczuk, J.-Y. Bouguet, U.S.A Patent 7,053,894, issued May 2006.

3. OTHERS & PENDING SUBMISSIONS:

- ◆ **Wei-Chao Chen**, Agathe Battestini, Natasha Gelfand and Vidya Setlur, “Visual Summaries of Popular Landmarks from Community Photo Collections”, submitted for publication, Sept 2008.
- ◆ Panel member, “Business Opportunities in Multi-Camera and Embedded Vision”, ACM/IEEE International Conference on Distributed Smart Camera, Sept. 2008.
- ◆ Tianli Yu, Hongcheng Wang, Narendra Ahuja, **Wei-Chao Chen**. “Sparse Lumigraph Relighting by Illumination and Reflectance Estimation from Multi-View Images”, Technical Sketch, SIGGRAPH 2006.
- ◆ Pei-Lun Li, Shih-Hsuan Hsu, **Wei-Chao Chen**, Li-Yi Wei, Yung-Yu Chuang. “Rendering Complex Scenes with Memory-Coherent Ray Tracing on Graphics Hardware”, submitted for publication.
- ◆ **Wei-Chao Chen**, L. Nyland, A. Lastra, H. Fuchs, “Acquisition of Large-Scale Surface Light Fields”, Technical Sketch, SIGGRAPH 2003.
- ◆ **Wei-Chao Chen**, “Light Field Mapping: Efficient Representation of Surface Light Fields”, book chapter in “Energy, Simulation-Training, Ocean Engineering and Instrumentation: Research Papers of the Link Foundation Fellows, Vol. 3”, pp 89-121, editor Brian J. Thompson, University of Rochester Press.
- ◆ **Wei-Chao Chen**, R. Grzeszczuk, “Image-Based Rendering for Computer Games”, course at Game Developer Conference, San Jose, March 2002.
- ◆ **Wei-Chao Chen**, Radek Grzeszczuk, Jean-Yves Bouguet. “Light Field Mapping: Efficient Compression and Interactive Rendering of Surface Light Field”, part of “Acquisition and Visualization of Surface Light Fields”, SIGGRAPH 2001 Course #46.

Services

Committee Member ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (2009)
IEEE Computer Society Conference on Computer Vision and Pattern Recognition (2009)

Reviewer ACM SIGGRAPH Conference
ACM SIGGRAPH Symposium on Computer Animation
ACM Transaction on Graphics
IEEE Computer Society Conference on Computer Vision and Pattern Recognition
IEEE Visualization
IEEE Transactions on Visualization and Computer Graphics
Computer Graphics International Conference (IEEE/ACM)
Pacific Graphics (Conference on Computer Graphics and Applications)
Eurographics

Updated: October 3, 2008