

## Wei-Chao Chen, Ph.D.

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Taipei, Taiwan 100

### Education

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- 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

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- 12/2011 - Present Co-Founder and Director in RD & IT  
Skywatch Innovation  
Taipei, Taiwan  
*Cloud cameras and related software services*  
[www.skywatch.com.tw](http://www.skywatch.com.tw)
- 01/2010 - Present Adjunct Assistant Professor  
Department of Computer Science and Information Technology  
National Taiwan University  
*Course on GPU Programming*  
[www.weichaochen.org](http://www.weichaochen.org)
- 8/2009 - 12/2011 Director  
Center for Information Technology Development  
SDI Corporation, Taiwan  
*Leading a new business unit to explore and develop projects related to rich media messaging and GPU technology*
- 02/2007 - 07/2009 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, with focuses on early computer vision and computational photography. Collaborate actively with Stanford University, MIT Media Lab, and Georgia Tech, among others.*
- 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

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### 1. JOURNAL & CONFERENCE PAPERS:

- ◆ *Warping-Based Novel View Synthesis from a Binocular Image for Autostereoscopic Displays*  
Yu-Hsiang Huang, Tzu-Kuei Huang, Yan-Hsiang Huang, Wei-Chao Chen, Yung-Yu Chuang  
IEEE International Conference on Multimedia and Expo (ICME 2012), to appear, July 2012
- ◆ Chia-Kai Liang, **Wei-Chao Chen** and Natasha Gelfand, “*TouchTone: Interactive Local Image Adjustment Using Point-and-Swipe*”, Eurographics, May 2010 (also in Computer Graphics Forum Journal).
- ◆ **Wei-Chao Chen**, Agathe Battestini, Natasha Gelfand and Vidya Setlur, “*Visual Summaries of Popular*

*Landmarks from Community Photo Collections*", ACM Multimedia, October 2009

- ◆ Duy-Nguyen Ta, **Wei-Chao Chen**, Natasha Gelfand, Kari Pulli. "SURFTrac: Efficient Tracking and Continuous Object Recognition using Local Feature Descriptors", IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR) (oral, 4% acceptance rate), June 2009.
- ◆ Orazio Gallo, Natasha Gelfand, **Wei-Chao Chen**, Marius Tico, Kari Pulli. "Artifact-free High Dynamic Range Imaging", IEEE International Conference on Computational Photography, April 2009.
- ◆ Gabriel Takacs, Vijay Chandrasekhar, Natasha Gelfand, Yingen Xiong, **Wei-Chao Chen**, Thanos Bismpiagiannis, 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:

- ◆ "Interactive Local Image Adjustment Interface for Directional Keypad", with Chia-Kai Liang and Natasha Gelfand, USA Patent Pending (NC69625), 2009
- ◆ "Interactive Local Image Adjustment Using Point-And-Swipe", with Chia-Kai Liang and Natasha Gelfand, USA Patent Pending (NC69623), 2009
- ◆ "SURFTrac: Efficient Tracking and Continuous Object Recognition using Local Feature Descriptors", with Duy-Nguyen Ta, Natasha Gelfand and Kari Pulli, USA Patent Pending, 2009
- ◆ "Method, Apparatus And Computer Program Product For Providing Image Modification", with Natasha Gelfand and Kari Pulli, USA Patent Pending (NC64547), 2008
- ◆ "Method, Apparatus, And Computer Program Product For Presenting Burst Images", with Natasha Gelfand, Kari Pulli and Marc Levoy, USA Patent Pending (NC64255), 2008
- ◆ "Method, Device, Mobile Terminal And Computer Program Product For A Point Of Interest Based Scheme For Improving Mobile Visual Searching Functionalities", with Natasha Gelfand, Ramakrishna Vedantham, Philipp Schloter, Radek Grzeszczuk, Suresh Chitturi, Jiang Gao, Markus Kahari, David Murphy, Kari Pulli, Ramin Vatanparast and Yingen Xiong, USA Patent Pending (Pub. App. No.

20080268876), filed April 2008

- ◆ *“Method, Apparatus And Computer Program Product For Providing A Visual Search Interface”*, with Natasha Gelfand, Radek Grzeszczuk, Yingen Xiong, USA Patent Pending (Pub. App. No. 20090083237), filed Sept. 2007
- ◆ *“Method, Apparatus and Computer Program Product for Performing a Visual Search Using Grid-Based Feature Organization”*, with Matthias Jacob, Jiang Gao, Natasha Gelfand, Radek Grzeszczuk, Kari Pulli, Philipp Schloter, Xianglin Wang, Yingen Xiong, USA Patent Pending (Pub. App. No. 20090083275), filed Sept. 2007
- ◆ *“Method and system for processing texture samples with programmable filter weights”*, with Li-Yi Wei, USA Patent 7,623,136, filed Dec. 2006, issued Nov. 2009.
- ◆ *“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 7,616,202, filed June 2006, issued Nov. 2009
- ◆ *“Graphical Shader by Using Delay”*, with Emmett Kilgariff, Rui Bastos and Douglas Hahn, USA Patent 7,486,290, filed June 2005, issued Feb. 2009
- ◆ *“Dynamic Texture Fetch Cancellation”*, with Mark Kilgard, Rui Bastos, Johnny Rhodes, Cass Everitt, USA Patent 7,528,843, filed Aug. 2005, issued May 2009.
- ◆ *“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, filed Jan. 2001, issued Jan. 2004.
- ◆ *“Compression of Surface Light Fields”*, with R. Grzeszczuk, J.-Y. Bouguet, USA Patent 7,053,894, filed Jan. 2001, issued May 2006.

### 3. INVITED, PENDING AND OTHER PUBLICATIONS:

- ◆ Yu-Hsiang Huang, Yan-Hsiang Huang, Tzu-Kuei Huang, **Wei-Chao Chen**, Yung-Yu Chuang. *“Multi-view Image Synthesis from Two-view Images Using a Content-preserving Warping Method”*, IPPR Conference on Computer Vision, Graphics, and Image Processing (CVGIP 2011), August 2011 [Excellent Paper Award]
- ◆ Kari Pulli, **Wei-Chao Chen**, Natasha Gelfand, Radek Grzeszczuk, Marius Tico, Ramakrishna Vedantham, Xianglin Wang, Yingen Xiong. *“Mobile Visual Computing”*, International Symposium on Ubiquitous Virtual Reality (ISUVR'09), GIST, Gwangju, South Korea, July 2009
- ◆ **Wei-Chao Chen**, Agathe Battestini, Natasha Gelfand and Vidya Setlur, *“Visual Summaries of Popular Landmarks from Community Photo Collections”*, Asilomar Conference on Signals, Systems, and Computers, October 2009
- ◆ 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

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<i>Committee Member</i>	ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (2009, 2010) IEEE Computer Society Conference on Computer Vision and Pattern Recognition (2009) IEEE International Symposium on Mixed and Augmented Reality (2009, 2010) ACM Workshop on Interactive Multimedia for Consumer Electronics (2009) IEEE International Conference on Computer Vision (ICCV 2011)
<i>Reviewer</i>	ACM SIGGRAPH / Transaction on Graphics Pacific Graphics (Conference on Computer Graphics and Applications) Eurographics ACM SIGGRAPH Symposium on Computer Animation (SCA) IEEE Transactions on Visualization and Computer Graphics (TVCG) IEEE Visualization IEEE Computer Graphics and Applications (CG&A) IEEE International Symposium on Mixed and Augmented Reality (ISMAR) Computer Graphics International Conference (IEEE/ACM) IEEE Computer Society Conference on Computer Vision and Pattern Recognition IEEE International Conference on Computer Vision (ICCV) Asian Conference on Computer Vision (ACCV) IEEE Conference on Computer Vision and Pattern Recognition (CVPR) IEEE Multimedia / Transaction on Multimedia

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