

Henry FUCHS

Federico Gil Distinguished Professor of Computer Science
Adjunct Professor in Department of Biomedical Engineering
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Citizenship: USA

Education

1975 Ph.D Computer Science, University of Utah
1970 B.A. Information and Computer Science, University of California at
Santa Cruz

Position(s) Held

1978- present UNC Chapel Hill
Adjunct Professor of Biomedical Engineering (2000-)
Federico Gil Distinguished Professor (1988-)
Adjunct Professor of Radiation Oncology (1988-2008)
Professor of Computer Science (1983-)
Associate Professor of Computer Science (1978-83)

1975-82 University of Texas at Dallas
Adjunct Associate Professor of Medical Computer Science,
Southwestern Medical School, The University of Texas Health
Science Center (1979-82)
Adjunct Associate Professor, Programs in Mathematical
Sciences (1978-82)
Computer Science Coordinator, Programs in Mathematical
Sciences (1977-78)
Assistant Professor, Mathematical Sciences (1975-78)

1970-74 University of Utah Research Assistant and Teaching Fellow,
Computer Science Department

1976- Present	Consultant or Member of Technical Technical Advisory Board, Mersive Technologies External Advisory Board, Harvard Neuroimage Analysis Center Former consulting and advisory board memberships: Mitsubishi Electric Research Lab, Thomson, Digital Equipment Corp., Fraunhofer CRCG, General Electric, Lockheed-Georgia, RAND Corp., Research Triangle Institute, ShoGraphics, Stellar Computer, Xerox Palo Alto Research Center, others
1968-74	Engineer and Consultant, Image Processing Laboratory of Jet Propulsion Laboratory of the California Institute of Technology (summers)
1968-70	Programmer and Consultant, Computer Center, University of California at Santa Cruz

Honors

- The 2013 IEEE VGTC Virtual Reality Career Award (“In recognition of his lifetime contributions to research and practice of virtual environments, telepresence and medical applications”).
- Fellow, the American Academy of Arts and Sciences, 1997.
- Member, the National Academy of Engineering, 1997.
- The 1997 Satava Award, Medicine Meets Virtual Reality Conferences. (“For your commitment to the transformation of medicine through visionary applications of interactive technology”).
- ACM Fellow, 1994. (“For distinguished contributions in the field of computer graphics”).

- The 1992 Computer Graphics Achievement Award, ACM/SIGGRAPH. ("In recognition of his outstanding contribution to high-performance, parallel display architecture").
- The 1992 National Computer Graphics Association (NCGA) Academic Award. ("For his outstanding leadership in the development and promotion of computer graphics applications in the academic community").

Patents and Patents Applications

18. A. Maimone, H. Fuchs, "Methods, Systems, and Computer Readable Media for Generating an Augmented Scene Display," WO 2014/113455.

17. H. Fuchs, N. Dierk, J.-M. Frahm, A. Lastra, D. Perra, "Low-Latency Stabilization for Head-Worn Displays," WO 2014/160342.

16. H. Fuchs, G Welch, "Methods, Systems, and Computer Readable Media for Improved Illumination of Spatial Augmented Reality Objects," PCT/US2014/065258; US 61/902,588.

15. J.-M. Frahm, H. Fuchs, M. Marathe, B. Mauchly, "System and Method for providing depth adaptive video conferencing," U.S. Patent No. 8.896,655.

14. H. Fuchs, K. Keller, R. Schubert, A. State, G. Welch, "Concepts for real and apparent deformation and motion of physical virtual objects," WO 2013/173724, US 14/401,834

13. G. Bishop, M. Dou, J.-M. Frahm, H. Fuchs, G. Welch, "Methods, Systems and Computer Readable Media for Unified scene acquisition, head and hand tracking in a wearable display," WO 2013/173728; US 14/401,833.

12. H. Fuchs, P. Lincoln, M. Marathe, B. Mauchly, A. Nashel, H. Towles, G. Welch, "System and method for depth perspective image rendering," US 12/366,593.

11. H. Fuchs, P. Lincoln, A. Nashel, A. State, G. Welch, "Methods, systems, and computer readable media for shader-lamps based physical avatars of real and virtual people," WO 2010/102288.

10. H. Fuchs, L. McMillan, A. Nashel, "Methods, systems, and computer readable media for generating autostereo three-dimensional views of a scene for a plurality of viewpoints using a pseudo-random hole barrier," WO 2010/102290.

9. A. Bulysheva, H. Fuchs, T. Peck, A. State, H. Yang, "Methods, systems, and computer readable media for image guided ablation," US 12/842,261.
8. H. Fuchs, K. Keller, L. McMillan, "Methods, systems, and computer program products for full spectrum projection," U.S. Patent No. 8,152,305.
7. H. Fuchs, D. Cotting, M. Naef and M. Gross, "Methods, systems and computer program products for imperceptibly embedding structured light patterns in projected color images for display on planar and non planar surfaces," U.S. Patent No. 7,182,465.
6. K. Keller, J. Ackerman, M. Rosenthal, H. Fuchs and A. State, "Methods and systems for real-time structured light depth extraction, and endoscope using real—time structured light depth extraction," U.S. Patent No. 6,503,195.
5. H. Fuchs, M. Livingston, T. Bishop, and G. Welch, "Dynamic generation of imperceptible structured light for tracking and acquisition of three dimensional scene geometry and surface characteristics in interactive three dimensional computer graphics applications," U.S. Patent No. 5,870,136.
4. H. Fuchs, "Image buffer having logic-enhanced pixel memory cells and method for setting values therein." U.S. Patent No. 4,827,445.
3. H. Fuchs and J. Poulton, "VLSI Graphic Display Image Buffer Using Logic Enhanced Pixel Memory Cells," U.S. Patent No. 4,783,649.
2. H. Fuchs and S. Pizer, "A 3-D Display Based on Conventional 2-D Graphics Equipment," U.S. Patent No. 4,607,255.
1. H. Fuchs, "Graphics Display System Using Logic-Enhanced Pixel Memory Cells," U.S. Patent No. 4,590,465.

Grants & Contracts (Selected)

1. National Science Foundation: "CHS: CGV: Small: Minimal-latency Tracking and Display for Matching Real and Virtual Worlds in Head-worn Displays" IIS-1423059, Sept. 2014 – Aug. 2017 (Fuchs, PI)
2. National Science Foundation: "II-New: Seeing the Future: Ubiquitous Computing in EyeGlasses" CRI-1405847, Sept. 2014 – Aug. 2017 (Fuchs, Co-PI)
3. National Science Foundation: "HCC: CGV: Small: Eyeglass-Style Multi-Layer Optical See-Through Displays for Augmented Reality" CHS-1319567, Sept. 2013-Aug. 2016 (Fuchs, PI).
4. NVIDIA Research: Cooperative Agreement & Support (Fuchs, PI).

5. Cisco Systems: "Telepresence Systems," 2006 – present (Fuchs, PI).
6. National Science Foundation: "II-NEW: A Robot Testbed for Real-time Motion Strategies and Autonomous Personal Assistants" CRI-1305286, Sept. 2013-Aug. 2015 (Fuchs, co-PI).
7. National Science Foundation: "CRI:IAD Integrated Projector-Camera Modules for the Capture and Creation of Wide-Area Immersive Experiences" CRI- 0751187, April 2008-March 2011 (Fuchs, PI)
8. Naval Air Systems Command-NAVAIR: SBIR Phase 2: "Deployable Intelligent Projections Systems for Training" Renaissance Science Corporation, Prime; (Fuchs, PI of UNC subcontract)
9. Office of Naval Research: "3D Display and Capture of Humans for Live-Virtual Training" (Fuchs joint PI)
10. Office of Naval Research: "Behavioral Analysis and Synthesis for Intelligent Training" (Fuchs joint UNC PI; Project lead by Naval Postgraduate School, A. Sadagic, PI)

OTHER FORMER GRANTS AND CONTRACTS from Defense Advanced Research Projects Agency; National Institutes of Health, National Cancer Institute; National Science Foundation; U.S. Air Force; U.S. Dept. of Energy.

Professional Activities (Selected)

- Member, Editorial Advisory Board, Computers & Graphics, 2013
- Member, External Advisory Board, Harvard's Neuroimage Analysis Center, 2004-2012.
- Member, External Advisory Board, Mersive Technologies. ~2008-present.
- Member, Steering Committee, ISMAR, International Symposium on Mixed and Augmented Realities, 2008 – present.
- Member, Dept. of Energy Blue Ribbon Panel for Evaluation of ASCI Program, 1998-1999.
- UNC Delegate, New Vistas in Transatlantic Science and Tech Cooperation, Washington D.C., 1998.
- Member, Information Science and Technology Study Group, Advanced Research Projects Agency, 1994.

- Member, Computer Science and Telecommunications Board, National Research Council, 1993-1997.
- Co-Director (with Gary Bishop), NSF Invitational Workshop on Research Directions in Virtual Environments, Chapel Hill, NC, March 1992.
- Co-Director (with K.H. Höhne and Steve Pizer), NATO Advanced Research Workshop in 3D Imaging in Medicine, Travemünde, Germany, June 1990.
- Chairman, 1986 Workshop on Interactive 3D Graphics, UNC Chapel Hill, Oct. 1986.
- Distinguished Visitor, IEEE Computer Society, 1985-1986.
- Chairman, 1985 Chapel Hill Conference on VLSI, May 1985. (7th Annual. All previous ones held at Caltech and MIT). Conference now called S.I.S.
- Chairman, Tutorial on VLSI and Computer Graphics, SIGGRAPH'83, SIGGRAPH'84, SIGGRAPH'85.
- Associate Editor, *ACM Transactions on Graphics*, 1983-1988.
- Guest Editor, *ACM Transactions on Graphics*, Vol.1, No. 1, January 1982.
- Technical Program Chairman, SIGGRAPH'81.
- Member, Advisory Committee, National Science Foundation, Division of Microelectronic Information Processing Systems.
- Member, Special Study Sections, National Institutes of Health; Review Panels and Site Visit Committees, National Science Foundation: 1978-Present.

Program Committee Memberships (Selected)

- ACM-SIGGRAPH Asia (2013)
- ACM-SIGGRAPH (1979, 1980, 1981, 1985-1992, 1998-2001, 2005) Annual Conferences on Computer Graphics and Interactive Techniques
- Symposium on Interactive 3D Graphics, 2001 in Chapel Hill, N.C.
- Symposium on Interactive 3D Graphics, 1990 at Snowbird, Utah
- Workshop on Volume Visualization, 1989 at UNC-Chapel Hill

- Conference on Advanced Research in VLSI (1986 at MIT, 1987 at Stanford, 1988 at MIT, 1989 at Caltech)
- EUROGRAPHICS, 1997
- International Electronic Image Week (CESTA, SIGGRAPH) FRANCE (1986 and 1987)
- Computer Graphics International (1987 in Japan; 1988 in Switzerland)

Publications (Reverse chronological order)

202. A. Ullah Naweed, L. Chen, M. Dou, H. Fuchs. "Enhancement of 3D Capture of Room-sized Dynamic scenes with Pan-Tilt-Zoom Cameras." International Symposium on Visual Computing (ISVC) 2014 (Las Vegas, Nevada, Dec. 8-10, 2014).
201. F. Zheng, T. Whitted, A. Lastra, P. Lincoln, A. State, A. Maimone, and H. Fuchs. "Minimizing Latency for Augmented Reality Displays: Frames Considered Harmful." IEEE ISMAR, September 2014.
200. H. Fuchs, A. State, J. Bazin. "Immersive 3D Telepresence." *IEEE Computer*. Vol.47, no. 7, pp. 46-52. July 2014.
199. D. Sonnenwald, H. Söderholm, G. Welch, B. Cairns, J. Manning, and H. Fuchs. "Illuminating collaboration in emergency health care situations: paramedic-physician collaboration and 3D telepresence technology". Information Research, 19(2) paper 618, 2014.
198. C. Fleury, T. Popa, T. Cham, and H. Fuchs. "Merging Live and pre-Captured Data to support Full 3D Head Reconstruction for Telepresence." *Eurographics 2014*, (Strausbourg, France, April 7-11, 2014), pp 9-12, 2014.
197. A. Maimone, D. Lanman, K. Rathinavel, K. Keller, D. Luebke, and H. Fuchs. Pinlight Displays: Wide Field of View Augmented Reality Eyeglasses Using Defocused Point Light Sources. SIGGRAPH 2014 (Vancouver, Canada, August 10-14, 2014)
196. M. Dou and H. Fuchs. "Temporally Enhanced 3D Capture of Room-sized Dynamic Scene with Commodity Depth Cameras" IEEE VR2014, 2014. Award: Best short paper
195. A. Maimone, R. Chen, H. Fuchs, R. Raskar, and G. Wetzstein. "Wide Field of View Compressive Light Field Display using a Multilayer Architecture and

- Tracked Viewers“. Society of Information Display Week 2014 (San Diego, CA, USA, June 1-6, 2014)
194. A. Maimone and H. Fuchs. "Computational Augmented Reality Eyeglasses." International Symposium on Mixed and Augmented Reality (ISMAR) 2013 (Adelaide, Australia, October 1-4, 2013).
 193. M. Dou, H. Fuchs, and J.-M. Frahm. "Scanning and Tracking Dynamic Objects with Commodity Depth Cameras." International Symposium on Mixed and Augmented Reality (ISMAR) 2013 (Adelaide, Australia, October 1-4, 2013).
 192. A. Sadagic, M. Kolsch, G. Welch, C. Basu, C. Darken, J. Wachs, H. Fuchs, H. Towles, N. Rowe, J.-M. Frahm, L. Guan, R. Kumar, H. Cheng. "Smart Instrumented Training Ranges: Bringing Automated System Solutions to Support Critical Domain Needs," The Journal for Defense Modeling and Simulation (JDMS), Vol. 10 No. 3, July 2013.
 191. A. Maimone, G. Wetzstein, M. Hirsch, D. Lanman, R. Raskar, and H. Fuchs. Focus 3D: Compressive Accommodation Display. ACM Trans. Graph. 32, 5. Article 153 (September 2013).
 190. A. Maimone, X. Yang, N. Dierk, A. State, M. Dou, and H. Fuchs. "General-Purpose Telepresence with Head-Worn Optical See-Through Displays and Projector-Based Lighting." IEEE Virtual Reality 2013 (Orlando, FL, USA, March 16-23, 2013) Award: Best short paper
 189. A. Maimone and H. Fuchs. "Real-Time Volumetric 3D Capture of Room-Sized Scenes for Telepresence." 3DTV Conference: The True Vision - Capture, Transmission and Display of 3D Video (3DTV-CON) 2012 (Zurich, Switzerland, October 15-17, 2012).
 188. A. Maimone, J. Bidwell, K. Peng and H. Fuchs. "Enhanced Personal Autostereoscopic Telepresence System using Commodity Depth Cameras.", Computers & Graphics, Volume 36, Issue 7, November 2012, pp. 791-807.
 187. T. Peck, H. Fuchs, and M. Whitton (2012). The Design and Evaluation of a Large-Scale Real-Walking Locomotion Interface. IEEE Transactions on Visualization and Computer Graphics 18(7), July 2012, 1053-1067.
 186. A. Maimone and H. Fuchs. "Reducing Interference Between Multiple Structured Light Depth Sensors Using Motion." IEEE Virtual Reality 2012 (Orange County, CA, USA, March 4-8, 2012) Award: Best short paper

185. M. Dou, L. Guan, J.-M. Frahm, H. Fuchs: Exploring High-Level Plane Primitives for Indoor 3D Reconstruction with a Hand-held RGB-D Camera. ACCV Workshops (2) 2012: 94-108.
184. M. Dou; Y. Shi; J.-M. Frahm; H. Fuchs; B. Mauchly; M. Marathe: "Room-sized informal telepresence system," *IEEE Virtual Reality 2012 Conference (Orange County, CA, 4-8 March 2012)*, pp. 15-18.
183. A. Maimone and H. Fuchs. "A First Look at a Telepresence System with Room-Sized Real-Time 3D Capture and Large Tracked Display." 21st International Conference on Artificial Reality and Telexistence (ICAT) (Osaka, Japan, November 28-30, 2011).
182. P. Lincoln, G. Welch, A. Nashel, A. State, A. Ilie, H. Fuchs: Animatronic shader lamps avatars. *Virtual Reality* 15(2-3): 225-238 (2011).
181. C. Burke, J. Cullen, A. State, S. Gadi, K. Wilber, R. Michael, A. Bulysheva, A. Pease, M. Mauro, H. Fuchs (2011). "Development of an Animal Model for Radiofrequency Ablation of Primary, Virally Induced Hepatocellular Carcinoma in the Woodchuck." *Journal of Vascular and Interventional Radiology*, 22(11), p. 1613-1618, November 2011.
180. A. Maimone and H. Fuchs "Encumbrance-free Telepresence System with Real-time 3D Capture and Display using Commodity Depth Cameras" International Symposium on Mixed and Augmented Reality (ISMAR) 2011 (Basel, Switzerland, October 26-29, 2011).
179. P. Lincoln, G. Welch, H. Fuchs. "Continual Surface-Based Multi-Projector Blending for Moving Objects." *IEEE Virtual Reality 2011* (Singapore, March 19-23, 2011).
178. T. Peck, H. Fuchs, M. Whitton. "An Evaluation of Navigational Ability Comparing Redirected Free Exploration with Distractors to Walking-in-Place and Joystick Locomotion Interfaces." *IEEE Virtual Reality 2011* (Singapore, March 19-23, 2011).
177. G. Ye, A. State, H. Fuchs. "A Practical Multi-viewer Tabletop Autostereoscopic Display." *Proceedings of the International Symposium on Mixed and Augmented Reality (ISMAR) 2010* (Seoul, South Korea, October 13 -16, 2010).
176. T. Peck, H. Fuchs, M. Whitton "Improved Redirection with Distractors: A Large-Scale-Real-Walking Locomotion Interface and its Effect on Navigation in Virtual Environments," *IEEE Virtual Reality 2010*.

175. P. Lincoln, G. Welch, A. Nashel, A. State, A. Ilie, H. Fuchs. (2010). Animatronic Shader Lamps Avatars. *Virtual Reality*, Springer London, pp. 10-14.
174. T. Peck, H. Fuchs, M. Whitton, "Evaluation of Reorientation Techniques and Distractors for Walking in Large Virtual Environments," *IEEE Transactions on Visualization and Computer Graphics*, pp. 383-394, May/June, 2009.
173. A. Nashel and H. Fuchs (2009). Random Hole Display: A Non-Uniform Barrier Autostereoscopic Display, In *3DTV Conference: The True Vision - Capture, Transmission and Display of 3D Video*, 2009.
172. G. Welch, D. Sonnenwald, H. Fuchs, B. Cairns, K. Mayer-Patel, H. Soderholm, R. Yang, A. State, H. Towles, A. Ilie, M. Ampalam, S. Krishnan, V. Noel, M. Noland, J. Manning. (2009). "3D Medical Collaboration Technology to Enhance Emergency Healthcare." *The Journal of Biomedical Discovery and Collaboration* 4:4.
171. H. Towles, T. Johnson, H. Fuchs. (2009). Projector Based Displays. *The PSI Handbook of Virtual Environments for Training and Education Vol. 2*. D. Nicholson, D. Schmorrow and J. Cohn. Westport, Praeger Security International. pp. 63-89.
170. A. Sadagic, G. Welch, C. Basu, C. Darken, R. Kumar, H. Fuchs, H. Cheng, J.-M. Frahm, M. Kolsch, N. Rowe, H. Towles, J. Wachs, A. Lastra. *New Generation of Instrumented Ranges: Enabling Automated Performance Analysis*. Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC-2009), Orlando, FL.
169. P. Lincoln, G. Welch, A. Nashel, A. Ilie, A. State, H. Fuchs. (2009). Animatronic Shader Lamps Avatars. *8th IEEE and ACM International Symposium on Mixed and Augmented Reality (ISMAR)*, Orlando, FL.
168. P. Lincoln, A. Nashel, A. Ilie, H. Towles, G. Welch, H. Fuchs. (2009). Multi-view lenticular display for group teleconferencing. *IMMERSCOM 2009*, Berkeley, CA.
167. T. Johnson, G. Welch, H. Fuchs, E. LaForce, H. Towles. (2009). *A Distributed Cooperative Framework for Continuous Multi-Projector Pose Estimation*. *IEEE Virtual Reality 2009*, Lafayette, LA, IEEE Computer Society Press.
166. D. Sonnenwald, H. Soderholm, J. Manning MD, B. Cairns MD, H. Fuchs and G. Welch (2008) "Exploring the potential of video technologies for collaboration in emergency medical care. Part I: Information sharing." *Journal of the American*

- Society for Information Science and Technology, Dec. 2008, vol.59, pp. 2320-2334.
165. D. Sonnenwald, H. Soderholm, J. Manning MD, B. Cairns MD, H. Fuchs and G. Welch (2008) "Exploring the potential of video technologies for collaboration in emergency medical care. Part II: Task performance." Journal of the American Society for Information Science and Technology, Dec. 2008, vol.59, pp. 2335-2349.
164. T. Peck, M. Whitton, and H. Fuchs. "Evaluation of reorientation techniques for walking in large virtual environments," IEEE Virtual Reality 2008, IEEE Computer Society Press. March 2008.
163. G. Welch, D. Sonnenwald, H. Fuchs, B. Cairns, K. Mayer-Patel, R. Yang, A. State, H. Towles, A. Ilie, S. Krishnan, et al.: Remote 3D Medical Consultation. Virtual Realities 2008: 139-159
162. H. Fuchs, A. State, H. Yang, T. Peck, S. Lee, M. Rosenthal, A. Bulysheva, C. Burke. Optimizing a Head-Trackable Stereo Display System to Guide Hepatic Tumor Ablation. Proceedings of Medicine Meets Virtual Reality (MMVR) 2008. Studies in Health Technology Informatics 2008, vol. 132, pp. 126-131.
161. S. Larsen, P. Mordohai, M. Pollefeys, H. Fuchs, "Temporally Consistent Reconstruction from Multiple Video Streams using Enhanced Belief Propagation," Proc. ICCV'07
160. T. Johnson, F. Gyarfas, R. Skarbez, H. Towles, and H. Fuchs (2007). "A Personal Surround Environment: Projective Display with Correction for Display Surface Geometry and Extreme Lens Distortion," IEEE Virtual Reality 2007, pp. 147–154.
159. T. Johnson and H. Fuchs. Real-Time Projector Tracking on Complex Geometry Using Ordinary Imagery, Proceedings of CVPR'07, IEEE Conference on Computer Vision and Pattern Recognition (June 2007), pp. 1-8.
158. T. Johnson and H. Fuchs. A Unified Multi-Surface, Multi-Resolution Workspace with Camera-Based Scanning and Projector-Based Illumination, Eurographics Symposium on Virtual Environments/Immersive Projections Technology Workshop 2007, Wiemar, Germany, July 2007.
157. F. Brooks Jr., J. Cannon-Bowers, H. Fuchs, L. McMillan, and M. Whitton (2006). Virtual Environment Training for Dismounted Teams—Technical Challenges. Human Factors & Medicine Panel Workshop on Virtual Media for Military Applications, U.S. Military Academy, West Point, NY, June 2006, pp. 13–15.

156. G. Burdea, Z. Cohen, H. Fuchs, R. Satava: VR Support of Clinical Applications: Collaboration, Politics, and Ethics. VR 2007: 311-312.
155. E. Larsen, P. Mordohai, M. Pollefeys, H. Fuchs: Simplified Belief Propagation for Multiple View Reconstruction. 3DPVT 2006: 342-349.
154. H. Maurin, D. Sonnenwald, B. Cairns, J. Manning, E. Freid, H. Fuchs: Exploring gender differences in perceptions of 3D telepresence collaboration technology: an example from emergency medical care. NordiCHI 2006: 381-384.
153. P. Quirk, T. Johnson, R. Skarbez, H. Towles, F. Gyarfas, and H. Fuchs (2006). RANSAC-Assisted Display Model Reconstruction for Projective Display, Proceedings of Virtual Reality Conference (March 25-29, 2006), Emerging Display Technologies, p. 318.
152. L. Kohli, E. Burns, D. Miller and H. Fuchs (2005). "Combining Passive Haptics with Redirected Walking" ICAT 2005
151. F. Brooks, J. Cannon-Bowers, H. Fuchs, L. McMillan, and M. Whitton, "A New VE Challenge: Immersive Experiences for Team Training," Proceedings of HCI International 2005.
150. D. Cotting, M. Naef, M. Gross, and H. Fuchs, (2005) "Imperceptible Patterns for Reliable Acquisition of Mixed Reality Environments," International Workshop on Image Analysis for Multimedia Interactive Services, Montreux, Switzerland, 2005.
149. D. Cotting, R. Ziegler, M. Gross, and H. Fuchs, (2005) "Adaptive Instant Displays: Continuously Calibrated Projections Using Per-Pixel Light Control," Eurographics 2005, Dublin, Ireland.
148. A. State, K. Keller, and H. Fuchs, (2005). Simulation-Based Design and Rapid Prototyping of a Parallax-Free Orthoscopic Video See-Through Head-Mounted Display. Proceedings of the Fourth IEEE and ACM International Symposium on Mixed and Augmented Reality (October 5-8, 2005). IEEE Computer Society, Washington, DC, pp. 28-31.
147. G. Welch, R. Yang, S. Becker, A. Ilie, D. Russo, J. Funaro, A. State, K. Low, A. Lastra, H. Towles, M. D. Bruce Cairns, H. Fuchs, and A. van Dam, "Immersive Electronic Books for Surgical Training," IEEE Multimedia, vol. 12, pp. 22-35, 2005.
146. G. Welch, H. Fuchs, B. Cairns, K. Mayer-Patel, D. Sonnenwald, R. Yang, A. State, H. Towles, A. Ilie, M. Ampalam, S. Krishnan, H. Maurin, V. Noel, and M. Noland, Remote 3D Medical Consultation. Chapter in BROADMED: 1st IEEE/CreateNet

- International Conference on Telemedicine over Broadband and Wireless Networks. (Boston: Omnipress 2005), pp. 103-110.
145. D. Cotting, M. Naef, M. Gross, and H. Fuchs, "Embedding Imperceptible Patterns into Projected Images for Simultaneous Acquisition and Display," International Symposium on Mixed and Augmented Reality, Arlington, VA USA, 2004.
 144. A. Ilie, K. Low, G. Welch, A. Lastra, H. Fuchs, and B. Cairns, "Combining Head-Mounted and Projector-Based Displays for Surgical Training," *Teleoperators and Virtual Environments*, vol. 13, 2004.
 143. O. Schreer, H. Fuchs, W. IJsselsteijn, H. Yasuda: Introduction to the Special Issue on Immersive Telecommunications. *IEEE Trans. Circuits Syst. Video Techn.* 14(3): 285-287 (2004)
 142. W.-C. Chen, L. Nyland, A. Lastra, H. Fuchs (2003). Acquisition of Large-Scale Surface Light Fields. Technical Sketch, SIGGRAPH International Conference on Computer Graphics (San Diego, 2003), p. 1.
 141. N. Kelshikar, X. Zabulis, J. Mulligan, K. Daniilidis, V. Sawant, S. Sinha, T. Sparks, S. Larsen, H. Towles, K. Mayer-Patel, H. Fuchs, J. Urbanic, K. Benninger, R. Reddy, and G. Huntoon, "Real-time Terascale Implementation of Tele-immersion," International Conference on Computation Science 2003, Melbourne, Australia, 2003.
 140. S.-U. Kum, K. Mayer-Patel, and H. Fuchs, "Real-time Compression for Dynamic 3D Environments," in *Proceedings of the Eleventh ACM International Conference on Multimedia*. Berkeley, CA: ACM Press, 2003, pp. 185-194.
 139. A. Raij, G. Gill, A. Majumder, H. Towles, and H. Fuchs, "PixelFlex2: A Comprehensive, Automatic, Casually-Aligned Multi-Projector Display," *IEEE International Workshop on Projector-Camera Systems (PROCAMS-2003)*, Nice, France, 2003.
 138. A. State, K. Keller, M. Rosenthal, H. Yang, J. Ackerman, and H. Fuchs, "Stereo Imagery from the UNC Augmented Reality System for Breast Biopsy Guidance," *Medicine Meets Virtual Reality (MMVR)*, Newport Beach, CA, 2003.
 137. J. Ackerman, K. Keller, and H. Fuchs, "Surface Reconstruction of Abdominal Organs Using Laparoscopic Structured Light for Augmented Reality Applications," *Electronic Imaging 2002 - Photonics West*, 2002.
 136. M. Rosenthal, A. State, J. Lee, G. Hirota, J. Ackerman, K. Keller, E. Pisano, M. Jiroutek, K. Muller, and H. Fuchs, "Augmented Reality Guidance for Needle Biopsies: An Initial Randomized, Controlled Trial in Phantoms," *Medical Image Analysis*, vol. 6, pp. 313-320, 2002.

135. H. Towles, W.-C. Chen, R. Yang, S.-U. Kum, H. Fuchs, N. Kelshikar, J. Mulligan, K. Daniilidis, L. Holden, B. Zeleznik, A. Sadagic, and J. Lanier, "3D Tele-Collaboration Over Internet2," International Workshop on Immersive Telepresence (ITP2002), Juan Les Pins, France, 2002.
134. A. van Dam, H. Fuchs, S. Becker, L. Holden, A. Ilie, K.-L. Low, A. Spalter, R. Yang, and G. Welch, "Immersive Electronic Books for Teaching Surgical Procedures," Pre-ICAT CREST Symposium on Telecommunication, Teleimmersion, and Telexistence, Tokyo, Japan, 2002.
133. R. Yang, C. Kurashima, A. Nashel, A. Lastra, and H. Fuchs, "Creating Adaptive Views for Group Video Teleconferencing -- An Image-Based Approach," International Workshop on Immersive Telepresence (ITP2002), Juan Les Pins, France, 2002.
132. D. Bandyopadhyay, R. Raskar, and H. Fuchs, "Dynamic Shader Lamps: Painting on Real Objects," International Symposium on Augmented Reality (ISAR 2001), New York City, NY, 2001.
131. H. Fuchs, "Omnidirectional Vision and Tele-Presence," International Conference on Advanced Robotics 2001 Workshop (ICAR), Budapest, Hungary, 2001.
130. G. Hirota, S. Fisher, C. Lee, A. State, and H. Fuchs, "An Implicit Finite Element Method for Elastic Solids in Contact," Computer Animation 2001, Seoul, South Korea, 2001.
129. K.-L. Low, G. Welch, A. Lastra, and H. Fuchs, "Life-Sized Projector-Based Dioramas," ACM Symposium on Virtual Reality Software and Technology, Banff, Alberta, Canada, 2001.
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3. H. Fuchs, J. Duran, and B. Johnson, "A System for Automatic Acquisition of Three-Dimensional Data," 1977 National Computer Conference, 1977.
2. H. Fuchs, Z. Kedem, and S. Uselton, "Optimal Surface Reconstruction from Planar Contours," *Communications of the ACM*, vol. 20, pp. 693-702, 1977. One of only two papers from Siggraph'77 Conference selected to be published in CACM.
1. H. Fuchs, "The Automatic Sensing and Analysis of Three-Dimensional Surface Points from Visual Scenes (Ph.D. Dissertation)," in Department of Computer Science. Salt Lake City, UT: University of Utah, 1975.

Technical Reports (Selected)

- D. Bandyopadhyay, R. Raskar, A. State, and H. Fuchs, "Dynamic Spatially Augmented 3D Painting," University of North Carolina at Chapel Hill Department of Computer Science, Chapel Hill, NC 2001.
- R. Raskar, H. Fuchs, G. Welch, A. Lake, and M. Cutts, "3D Talking Heads: Image Based Modeling at Interactive Rates Using Structured Light Projection," University of North Carolina at Chapel Hill Department of Computer Science, Chapel Hill, NC 1998.
- W. Dally, L. McMillan, G. Bishop, and H. Fuchs, "The Delta Tree: An Object-Centered Approach to Image-Based Rendering," Massachusetts Institute of Technology Artificial Intelligence Laboratory, Technical Memo 1604, Cambridge, MA, May 1996.
- U. Neumann, A. State, H. Chen, H. Fuchs, T. Cullip, Q. Fang, M. Lavoie, and J. Rhoades, "Interactive Multimodal Volume Visualization for a Distributed Radiation-Treatment Planning Simulator," University of North Carolina at Chapel Hill Department of Computer Science, Chapel Hill, NC 1994.

Invited Talks (Selected)

51. Technical University of Vienna, Symposium of Visual Computing Trends, January 2015
50. Samsung Developer Conference, San Francisco, November 2014
49. University of Maryland, Department of Computer Science, Distinguished Colloquia, October 2014.

48. Keynote (1 of 4), 5th International Conference on Remote Sensing in Archeology, Duke University, October 2014.
47. Keynote, IEEE VR 2014, Minneapolis, MN, March 2014.
46. Keynote, BEAMING Workshop, Barcelona, Spain, June 2011, "Toward Improved Telepresence: BeingThere International Research Center for Telepresence and Telecollaboration...and related work."
45. Keynote, Japan VR, Tokyo, Japan, December 2010.
44. Keynote, ISMAR 2010, Seoul, Korea, October 2010.
43. Keynote, IEEE International Symposium on Multimedia (ISM2010), Taichung, Taiwan, December 2010, "Physical and Digital Media of Telepresence."
42. ISMAR Symposium Workshop, Orlando, Florida, October 2009.
41. AMI-ARCS Workshop, London, England, September 2009.
40. NAIST, Japan, July 2009.
39. Keynote, NOSSDAV, Williamsburg, Virginia, June 2009, "Experiences Building Telepresence Systems."
38. University of Pennsylvania, Franklin Institute Symposium, RoboFest: A Celebration of Robotics at the GRASP Laboratory, April 2009.
37. NASA Langley Research Center, Initiated the Speaker Series on Virtual Worlds, April 2009.
36. 9th Marconi Research Conference, Office Ergonomics Research Committee (OERC), Marconi Center, Marshall, CA, January 2009.
35. Keynote, Graphics Hardware 2008, Sarajevo, Bosnia and Herzegovina June 20, 2008.
34. Keynote, PROCAMS 2008, Los Angeles, CA, August 9, 2008.
33. Keynote (1 of 2), Eurographics 2004, Grenoble, France, September 2004.
32. J. Barkley Rosser Distinguished Lecture, University of Wisconsin, Madison, WI, March 2001.
31. Distinguished Lecture, National Science Foundation (NSF), February 2001.

30. Address, Sesquicentennial Anniversary, University of Rochester, October 2000 (1 of 2 in Computer Science).
29. Distinguished Lecture, Stanford University Department of Computer Science, June 2000.
28. Keynote Address, VRST '99, London, England, December 1999.
27. Keynote, 1st International Symposium on Mixed Reality (ISMR'99), Yokohama, Japan. Mar. 9, 1999.
26. University of Utah Department of Computer Science Distinguished Lecture, December 8, 1998.
25. Invited Paper, Advanced Multimedia Content Processing (AMCP'98), Osaka, Japan. Nov. 9, 1998.
24. Keynote, Advanced School for Computing and Imaging (ASCI'98), Lommel, Belgium. June 11, 1998.
23. Fraunhofer Inauguration Symposium, Virtual Environments Panel, Darmstadt, Germany, Oct. 30, 1997.
22. Keynote, Eurographics '97, Budapest, Hungary, September 6, 1997.
21. Keynote, Computer Graphics International'97, Hasselt, Belgium, June 25, 1997.
20. Keynote, 2nd Visualization Conference, Technicon, Haifa, Israel, June 30, 1996.
19. Keynote, 1995 Symposium on Interactive 3D Graphics, Monterey, CA, April 10-12, 1995.
18. University of Southern California Department of Computer Science Distinguished Lecture, Los Angeles, CA, Dec. 2, 1994.
17. Invited talk, The London VR User Show, VR in Medicine Workshop, London, England, September 1994.
16. IEEE EMBS 1994 International Summer School on Three-Dimensional Biomedical Imaging, to teach course on Virtual Reality in Medical Imaging, July 7-8, 1994.
15. Invited talk, ATR Workshop on Virtual Space Teleconferencing Systems, Kyoto, Japan, Dec. 3, 1993.
14. Invited talk, Computer Graphics International '92 (CGI '92), Tokyo, Japan, June 24, 1992.

13. NATO Advanced Research Workshop, Travemünde, Germany, June 26, 1990.
12. Keynote, First Conference on Visualization in Biomedical Computing, Atlanta, Georgia, May 23, 1990.
11. Keynote Address, Computer Graphics International, Leeds, UK, June 1989.
10. World Congress on Medical Physics and Biomedical Engineering, San Antonio, Texas, August 1988.
9. Member of panel on "Parallel Processing for Computer Vision and Display" at SIGGRAPH'88, August 1988.
8. Member of panel on "3D Imaging in Medicine: Pitfalls and Possible Remedies" at the National Computer Graphics Association annual conference, Anaheim, California, March 1988.
7. International Conference and Exhibition on Parallel Processing for Computer Vision and Display (sponsored by IBM - UK Labs, Univ. of Leeds, British Computer Society, Computer Graphics Society, Eurographics), University of Leeds, UK (January 1988).
6. NATO International Advanced Study Institute on Theoretical Foundations of Computer Graphics and CAD, Il Ciocco, Lucca, Italy (July 1987).
5. NATO International Advanced Study Institute on Mathematics and Computer Science in Medical Imaging, Il Ciocco, Lucca, Italy, (September 1986).
4. International Summer Institute (British Computer Society), State of the Art in Computer Graphics, Stirling, Scotland (June 1986).
3. NATO International Advanced Study Institute on Fundamental Algorithms for Computer Graphics, Ilkley, England (April 1985).
2. Eurographics'85, Nice, France (September 1985) (1 of 4 keynotes).
1. NATO International Advanced Study Institute on Microarchitecture of VLSI Computers, Urbino, Italy (July 1984).