CURRICULUM VITAE

Hong Hua

Associate Professor of Optical Sciences, University of Arizona

(Updated on January 31st, 2012)

Contact Information

Hong Hua
College of Optical Sciences
University of Arizona
Tucson, AZ 85721

Voice: (520) 626-8703
Fax: (520) 621-3389
Email: hhua@optics.arizona.edu
Web: http://3dvis.optics.arizona.edu

Fields of Major Research Interests

3D displays and optical imaging (i.e. optical system design, instrumentation, and objective assessment of 3D display and imaging technologies); **human-computer interface in immersive virtual and augmented environments** (i.e. multi-user, multi-scale heterogeneous display environments to enable collaborative activities, innovative human-computer interface technologies, and usability assessment of interface methods in single- or multi-user environments); and **applications of technologies in medicine, scientific visualization, and education**.

Education

Universities Attended	Department	Degrees	Dates Awarded
Beijing Institute of Technology	Opto-electronic Engineering	Ph.D. with honors	1999
University of Central Florida	School of Optics/CREOL	Visiting student	02/1999-07/1999
Beijing Institute of Technology	Opto-electronic Engineering	B.S.E. with honors	1994

Doctoral Dissertation

- Title: Techniques of Immersion Enhancement and Interaction for Virtual Reality
- Advisor: Dr. Yongtian Wang, Professor of Optical Engineering
- Major Field: Optical Engineering
- Subfields: 3D displays, augmented reality, virtual reality, human computer interface

Employment

Associate Professor

- College of Optical Sciences, University of Arizona, 2009-
- (Joint) Department of Electrical and Computer Engineering, University of Arizona
- (Joint) Department of Computer Sciences, University of Arizona

Assistant Professor

- College of Optical Sciences, University of Arizona, 2004-2009
- (Joint) Department of Electrical and Computer Engineering, University of Arizona, 2004-2009
- (Joint) Department of Computer Sciences, University of Arizona, 2004-2009
- Department of Information and Computer Sciences, University of Hawaii at Mãnoa, 01/2003-12/2003

Beckman Research Fellow

- Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, 12/1999-12/2002

Postdoctoral Research Associate

- ODAlab, School of Optics/CREOL, University of Central Florida, 08/1999-12/1999

Honors and Awards

Honors

- Nominated to attend the 2010 EU-US Frontiers of Engineering Symposium by National Academy of Engineering
- Nominated as UA Researchers @ Leading Edge on 2010 Innovation Day at UA
- Distinguished Student Paper Award (Co-authored with student) at the 2011 SID International Symposium (Display Week) for the paper "A depth-fused multi-focal-plane display prototype enabling focus cues in stereoscopic displays," 05/2011
- Best Student Paper Award (co-authored with students) at the 7th IEEE and ACM International Symposium on Mixed and Augmented Reality (ISMAR'08) for the paper "An optical see-through head-mounted display with addressable focal planes", 09/2008
- Recipient of National Science Foundation (NSF) CAREER Award, 2007
- Best Paper Award (Honorable Mention), IEEE Virtual Reality 2003
- Excellent Ph.D. Dissertation, Beijing Institute of Technology, 07/1999
- First Prize of Excellent Scientific Papers, Beijing Institute of Technology, 08/1998
- Excellent B.S.E. Thesis, Beijing Institute of Technology, 07/1994

Scholarships

- Beckman Fellowship, Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, 12/1999-12/2002
- China Instrument and Control Society Scholarship (~50 awardees selected nation wide), 12/1997 and 12/1994
- Xu Teli Scholarship (~10 awardees selected at Beijing Institute of Technology), 01/1996
- Aerospace Long-March Scholarship (~5 awardees selected at Beijing Institute of Technology), 11/1993
- Ma Shixiu Optical Engineering Scholarship (1 awardee selected in the Department of Opto-electronic Engineering, Beijing Institute of Technology), 12/1992
- The People's Scholarship of Beijing Institute of Technology (Fist prize, 7 times)

Awards/Scholarship Received by Supervised Students

- Xinda Hu, SID 2011 Distinguished Student Paper Award
- Dewen Cheng, SPIE Price/Williams Optical Design and Engineering Scholarship, 2010
- Rui Zhang, SPIE Scholarships on Optical Science and Engineering, 2009
- Rui Zhang, Outstanding Graduate Student, College of Optical Sciences, University of Arizona, 2009
- Dewen Cheng, Optical Research Associates Student Optical Design Award, 07/2009
- Dewen Cheng, Michael Kidger Memorial Scholarship, 2009
- Sheng Liu, IEEE and ACM Best Student Paper Award, 2008
- Craig Pansing, Optical Research Associates Student Optical Design Award, 2005

Teaching

University of Arizona, College of Optical Sciences

- Courses
  - Opti471B, Advanced Optics Lab, Spring 2005-date (Undergraduate)
  - Opti588, Introduction to Display Sciences and Technology, Fall 2006-date (Graduate)
  - Opti588DL (Distance Learning), Introduction to Display Sciences and Technology, Fall 2011
- Independent Studies

- Opti599, Undergraduate Independent Study
- Opti499, Undergraduate Independent Study
- Opti492, Undergraduate Directed Research
- CSC599/CSC695, Graduate Independent Study

❖ Guest Lectures
- Opti 563, Photoelectronic imaging devices, Guest lectures (2), Spring 2004
- Opti 435/535, Visual Optics, Guest lecture (1), Spring 2004, 2005, 2006
- Opti 400, Radiometry, detectors and sources, Guest lectures (4), Fall 2007

University of Hawaii at Mãnoa, Department of Information and Computer Sciences

❖ Courses
- ICS 681: Selected Topics in Computer Graphics, Spring 2003 (Graduate)
- ICS 481: Introduction to Computer Graphics, Fall 2003 (Undergraduate)

❖ Research and Thesis Credits
- ICS 699: Directed Graduate Research, Summer 2003, Fall 2003

2009 IEEE and ACM International Symposium on Mixed and Augmented Reality

❖ Half-day tutorial on "3D display technology: fundamentals and state-of-art technologies", co-taught with Jannick Rolland, Oct. 21st, 2009, Orlando, USA

2000 5th International Conference on Human Interaction with Complex Systems

❖ Workshop on Technology of head-mounted displays for 3D visualization and wearable computers (half day), April 30-May 2, 2000, Urbana, Illinois, USA, 05/2000

Advising and Mentoring

Ph.D. Dissertations in Progress

❖ Leonard D Brown (08/2004-present), Ph.D. student of Computer Science, passed Comprehensive Exam in Fall 2006, plan to graduate in Spring 2010
❖ Xinda Hu (08/2009-present), Ph.D. student of Optical Sciences
❖ Jason Kuhn (05/2010-present), Ph.D. student of Optical Sciences
❖ Yi Qin (08/2010-present), Ph.D. student of Optical Sciences
❖ Sheng-Huei Derek Lu (05/2011-), Ph.D. student of Optical Sciences

Ph.D. Dissertations Directed

❖ Sheng Liu (08/2005-08/2010), graduated with Ph.D. in Optical Sciences, "Methods for generating addressable focus cues in stereoscopic displays," University of Arizona
❖ Rui Zhang (01/2006-05/2010), graduated with Ph.D. in Optical Sciences, "Development and Assessment of Polarized Head Mounted Projection Displays," University of Arizona
❖ Dewen Cheng (08/2007-10/2010), Visiting Ph.D. Student of Optical Sciences, co-supervised with Prof. Yongtian Wang from Beijing Institute of Technology in China

MS Theses/Reports Directed

❖ Nickolaos Savidis (08/2007-05/2009), M.S. report, "Application and Effects of Tracking in 3D Visualization," Optical Sciences, University of Arizona, graduated with MS degree in May 2009
❖ Glenn Scott Gibb (08/2007-12/2007), M.S. report, "Characteristics, applications, and physics of volumetric three-dimensional displays," Optical Sciences, University of Arizona, graduated with MS degree in December 2007
❖ Craig Pansing (02/2004-06/2006), M.S. Thesis, "Optimization of illumination schemes for an eye-tracked head mounted display," Optical Sciences, University of Arizona, graduated with MS degree in June 2006
❖ Prasanna Krishnaswamy (02/2004-12/2004), M.S. Thesis, "Design and assessment of improved

feature-based eye tracking methods for head mounted displays," Electrical and Computer Engineering, University of Arizona, graduated with MS degree in December 2004

- Chunlian Hao (04/2003-12/2003), M.S. Report, "Magnetic tracker calibration for augmented reality," Information and Computer Sciences, University of Hawaii at Mãnoa, graduated with MS degree in December 2003

Undergraduate Research Advising

- Technical advisor for Senior Capstone Project (ENGR 498) (09/2004-05/2005): supervised the 3DCAM team with 5 senior students (Brian Miller, Diana Walter, David Clark, Curtis Rosenow, and Colan Kennelly)
- Technical advisor for Senior Capstone Project (ENGR 498) (09/2005-05/2006): supervised the Scatterometer team with 4 senior students (Seth Ginter, James McGovern, Carl Nissly, and Jared Roberts)
- Supervisor of Undergraduate Directed Research (01/2006-05/2006): Justan Forsyth, senior undergraduate student in the College of Optical Sciences, worked on the project, "Calibration of a panoramic imaging system."
- Supervisor of Undergraduate Research Assistant (02/2004-10/2004): Minglie Hu, senior undergraduate student in the College of Optical Sciences, worked on the project, "Design and development of a panoramic imaging system."

Other Graduate Advising (other than dissertation or thesis)

- Prassad Gabbur (09/2005-08/2008), Ph.D. student of Electrical and Computer Engineering
- Erick Ruiz (02/2004-05/2006): MS student in the College of Optical Sciences, worked on a project "Design and development of a panoramic camera system."
- Rui Zhang (01/2005-12/2005): graduate student in the Department of Physics, worked on a project titled "Design of a head-mounted display with mutual occlusion capability." He was admitted to the Optical Science program as a PhD student in Spring 2006.
- John Tamkin (01/2004-05/2005): Ph.D. student in the College of Optical Sciences, worked on his dissertation project titled "Multi-resolution fovea-contingent displays." He passed his dissertation proposal exam on December 17th, 2004. He is currently working with the Optical Research Associates.
- Yuan Wang (09/2004-06/2005), graduate student in the Department of Electrical and Computer Engineering, worked on a project titled "Development of eyetracking algorithms for an eyetracked head-mounted display."
- Leonard Brown (06/2003-12/2003): visiting student in the Department of Information and Computer Sciences at the University of Hawaii at Mãnoa, worked on a project titled "Development of tangible magic lens interface in augmented environments." He was admitted to the Computer Science program as a Ph.D. student at the University of Arizona in Fall 2004.

Mentoring

- Dr. Sangyoon Lee (07/2011-): Research Assistant Professor
- Dr. Sangyoon Lee (05/2008-07/2011): Post-doctoral Associate
- Dr. Zhenrong Zheng (06/2009-12/2009), Visiting Scholar
- Dr. Xiaorui Wang (07/2007-06/2008), Visiting Scholar
- Dr. Ji-Young Oh (06/2005-11/2007): Post-doctoral Associate

Service / Outreach

National/International General and Editorial Services

- Joseph Fraunhofer Award/Burley Prize Committee, Optical Society of America, 2011-
- Proposal Review Panelist, National Science Foundation (NSF), 2003, 2007, 2011
- Ad-hoc Proposal Reviewer, National Science Foundation, 2008, 2010, 2011

- Site-visit Review Committee Member, Science of Learning Center, NSF, 11/2005
- Site-visit Review Committee Member, Science and Technology Center, NSF, 10/2004
- Ad-hoc Proposal Reviewer, Indiana 21st Century Science and Technology Fund, 2004
- Permanent Consulting Editor, McGraw-Hill Encyclopedia of Science and Technology, 10/2005-2009
- Interim Consulting Editor, McGraw-Hill Encyclopedia of Science and Technology, 02/2005-10/2005

Conference/Symposium/Workshop Chair/Host Positions

- Co-host, Optical Society of America (OSA) 2012 3D Display Technology, Perception, and Application Incubator Meeting
- Chair, Symposium on The Future of 3-D Display: the Market Place and the Technology, Frontiers in Optics 2009/Laser Science XXV, Optical Society of America (OSA) 2009 Annual Meeting, Oct 11-15, 2009, San Jose, California, USA
- Workshop Co-chair, 2008 Workshop on Illumination Modeling: Simulation and Perception of Lit and Unlit Objects (IM), Optical Society of America, Rochester, NY, 2008
- Area Chair, the 6th IEEE and ACM International Symposium on Mixed and Augmented Reality (ISMAR), 2007
- Registration Chair, ACM International Symposium on User Interface Software and Technology (UIST), 2004 and 2005
- Meeting Session Co-chair, SPIE AeroSense 2002: Helmet Mounted Displays, Orlando, FL, 04/2002

Program Committees

- IEEE Virtual Reality (IEEE VR) Conference Program Committee , 2011-
- IEEE and ACM International Symposium on Mixed and Augmented Reality (ISMAR), 2003-present
- International Conference on Computer Vision and Pattern Recognition (CVPR), 2008-2011
- International Conference on Computer Vision (ICCV), 2007, 2009
- SPIE Optical Design and Testing IV (Photonics Asia 2010), SPIE Optical Design and Testing III (2007)
- ACM Virtual Reality Software and Technology (VRST) 2009, 2010
- International Conference on Optical Instrument and Technology, 2009, 2011

Journal/Conference Referee

- OSA Journals: Optics Express, Optics Letter, Applied Optics, and JOSA
- SPIE Journals: Optical Engineering, Journal of Electronic Imaging
- IEEE Journals: IEEE Transactions on Systems, Man, and Cybernetics, IEEE Computer Graphics and Applications, IEEE Transactions on Visualization and Computer Graphics, IEEE Proceedings,
- Other Journals: Journal of Optics, International Journal of Human Computer Interaction, Journal of Presence: Teleoperators and Virtual Environments, Computer Vision and Image Understanding, Optics Communication, Image and Vision Computing , Journal of Virtual Reality
- Major Conferences: a variety of IEEE and ACM conferences such as IEEE VR, IEEE/ACM ISMAR, ACM VRST, IEEE Visualization, ACM UIST 2005, ACM Computer-Human Interaction (CHI), SIGGRAPH, International Conference on Computer Vision, International Conference on Computer Vision and Pattern Recognition etc.

Departmental/College Committees and Services

- Optical Sciences Colloquium Committee, 2008-2009, 2010-2012
- Undergraduate Curriculum Committee, College of Optical Sciences, 2004-present
- Graduate Admission Committee, College of Optical Sciences, 2006-2007, 2011-2012
- Jack D. Gaskill Scholarship Committee, 2006
- Optical Engineering Faculty Search Committee, 2005, 2009, 2010
- Graduate Comprehensive Exam—Oral Examination Committee Participation (2005-present)
- Service on Thesis/Dissertation Committees (other than as advisor) (2005-present)

University Committees and Services

- University Committee on Ethics and Commitment (2008-2011), elected in June 2008 for a three-year service, elected to serve as Vice Chair for 2010-2011
- Proposal Evaluation Committee for Spatially Immersive Environment Project, the Center for Computing and Information Technology, University of Arizona, 2004

Local/State Outreach

- 2011 SPIE Visiting Lecturer at the 1st Regional Meeting on Optics (CREO-CICESE) 2011
- Optical Sciences Community Speaker, University of Arizona, 03/2004 and 04/2007
- Lecturer/Demonstrator, Arizona Youth University: Optical Sciences Camp, Tucson, Arizona, 06/2006
- Participant, the Open House held by College of Optical Sciences (in coordination with the 2005 Optical Society of America Annual Meeting), 10/2005
- Demonstrator, "UA Daughters on Campus" event, 04/2004
- Lecturer, ICS Student Club, University of Hawaii at Mãnoa, 11/2003
- Participant, the yearly Open House held by Beckman Institute for Advanced Science and Technology, 03/2002 and 03/2001

Grants and Contracts (>3 Million 2000-2011)

Federal Grant Awards

1. National Science Foundation / Information and Intelligent Systems/Human Centered Computing, "Development and Assessment of an Eyeglass-style Eyetracked Near-Eye Display using Freeform Optical Technology", 2011-2014 ($499,599).
2. National Institute of Health/"Development of a multi-resolution foveated endoscope," 2011-2013 ($420,000).
3. National Science Foundation / Information and Intelligent Systems/Human Centered Computing, "Enabling focus cues in stereoscopic displays", 2009-2012 ($497,599).
4. National Science Foundation / Information and Intelligent Systems, "CAREER: Development of a heterogeneous display environment to support complex data visualization", 2007-2012 ($500,001).
5. National Science Foundation / Information and Intelligent Systems, "Development and assessment of a polarized head mounted projective display technology," 2005-2008 ($310,047).
6. National Science Foundation / Information and Intelligent Systems, "IIS/HCI: Collaborative Research: Development and assessment of head-mounted fovea-contingent display technology, " 2003-2007 ($375,818 out of $750,000 total budget).
7. National Science Foundation / Information Technology Research (ITR), "IIS/HCI: Collaborative Research: Development of head-mounted projective display for distance collaborative environments, " 2000-2004 ($294,857 out of $500,000 total budget)
8. NAVY /STTR phase I and Option (Partner with SA Photonics Corporation), "Development of low-cost augmented reality head mounted display", 07/2009~05/2010 ($30,000 out of $100,000).
9. NAVY /STTR phase II (Partner with SA Photonics Corporation), "Development of low-cost augmented reality head mounted display, " 11/2010~05/2012 ($170,376).
10. DARPA(Defense Advanced Research Project Agency)/SBIR phase I through UtopiaCompression Corporation, "A novel high-resolution panoramic camera", 01/2010~07/2010 ($12,754).

Private Funds

11. Osterhout Design Group, "Free-form prism-based design for a see-through head mounted display", 02/2010~03/2010 ($12,793).
12. Beckman Institute Research Grant, "Development of a head-mounted projective display for collaborative environments", Beckman Foundation, 2000-2002 ($60,000).

13. Beckman Institute Research Grant, "Design and integration of head-mounted display with eye tracking capability," Beckman Foundation, 2000-2001 ($35,000).

Other Grants

14. Faculty Travel Grant, University of Arizona, October 2005 ($750).

Industrial Consulting/Partnerships

1. Augmented Vision Inc, Tucson, AZ, Co-founder, 2010-
2. UtopiaCompression Corporation, Los Angeles, CA, Development of a novel high-resolution panoramic camera, 2009-
3. Trex Enterprises, San Diego, CA, Dynamic foveal vision display, 2009-2010
4. SAPhotonics, San Francisco, CA, Development of a low-cost augmented reality head mounted display, 2009-
5. Vision Technology, Champaign, IL, Development of a novel hemispherical view camera, 2001-2002.

Publications (Published or Accepted)

- *An asterisk (*) indicates publications substantially based on work done as a graduate student*
- *Brief summary of results from selected articles is given at the end of the CV and also available at: http://3dvis.optics.arizona.edu/publications/results.pdf*
- *PDF files of most of the following publications can be obtained at: http://3dvis.optics.arizona.edu/publications/publications.html*

Chapters in Scholarly Books and Monographs

1. Hong Hua, Leonard Brown, and Rui Zhang, "Head-mounted Projection Display Technology and Application," in Handbook of Augmented Reality, Springer Science+Business Media, 2011.
2. J. P. Rolland and Hong Hua, "Head-mounted display systems," in *Encyclopedia of Optical Engineering* (Editors: R. Barry Johnson and Ronald G. Driggers), New York, NY: Marcel Dekker, pp.1-13, 2005.
3. J. P. Rolland, F. Biocca, C. Gao, Hong Hua, and O. Harrysson. "Design and prototyping of a teleportal ultra-light weight large field of view head mounted display," in Virtual Reality and Augmented Reality Applications in Manufacturing (Editors: Ong, S. K., and Nee, A. Y. C.), Publisher: Springer, pp.179-200, July 2004.

Referred Journal Articles

4. Cheng D, Wang Y, Hua H, Sasian J: Design of a wide-angle, lightweight head-mounted display using free-form optics tiling. Opt Lett; 2011 Jun 1;36(11):2098-100.
5. Sangyoon Lee and Hong Hua, "Effects of viewing conditions and rotation methods in a collaborative tabletop AR environment," in IEEE Transactions on Visualization and Computer Graphics, 2011.
6. Sheng Liu and Hong Hua, "Extended depth-of-field microscopic imaging with a variable focus microscope objective," *Optics Express*, 19(1):353-362, 2011.
7. Dewen Cheng, Yongtian Wang, and Hong Hua, "Automatic image performance balancing in lens optimization," *Optics Express*, 18(11):11574-11588, 2010.
8. Sheng Liu and Hong Hua, "A systematic method for designing depth-fused multi-focal plane three-dimensional displays," *Optics Express*, 18(11):11562-11573, 2010.
9. Sheng Liu, Hong Hua, and Dewen Cheng "An optical see-through head-mounted display with addressable focus cues," *IEEE Trans. Vis. Comput. Graph.* **16**: 381-393 (2010). (Invited).
10. Chunyu Gao, Hong Hua, and N. Ahuja, "A hemispherical imaging camera," *Computer Vision and Image Understanding* (Accepted: March 2009; Available online), 114(2):168-178, 2010.
11. Prasad Gabbur, Hong Hua, and K. Barnard, "A fast connected components labeling algorithm for real-time pupil detection," *Machine Vision and Applications Journal* (Accepted: December 2008; Published online first: January 2009), 21(5):779-787, 2010.

12. Sheng Liu and Hong Hua, "Time-multiplexed dual-focal plane head-mounted display with a fast liquid lens," *Optics Letter*, 34(11):1642-44, June 2009.
13. Rui Zhang and Hong Hua, "Imaging quality of a retroreflective screen in head-mounted projection displays," *Journal of Optical Society of America: A,* 26(5): 1240-1249, May 2009.
14. Dewen Cheng, Yongtian Wang, Hong Hua, and M. M. Talha, "Design of an optical see-through head-mounted display with a low f-number and large field of view using a freeform prism," *Applied Optics*, 48(14): 2655-2668, May 2009.
15. Ji-young Oh and Hong Hua, "Usability of multi-scale interfaces for 3D workbench displays," in Journal of *Presence: Teleoperators and Virtual Environments,* 17(5): 415-440, October, 2008.
16. Rui Zhang and Hong Hua, "Design of a polarized head-mounted projection display using ferroelectric liquid-crystal-on-silicon microdisplays," *Applied Optics,* 47(15): 2888-96, May 2008.
17. Xiaorui Wang and Hong Hua, "Theoretical analysis for integral imaging performance based on microscanning of microlens array," *Optics Letter*, 33(5): 449-451, February 2008.
18. Rui Zhang and Hong Hua, "Characterizing polarization management in a p-HMPD system," *Applied Optics*, 47(4):512-522, January 2008.
19. Hong Hua and Sheng Liu, "A dual-sensor foveated imaging system," *Applied Optics*, 47(3): 317-27, January 2008. This article is also listed in *Virtual Journal for Biomedical Optics*, 3(2).
20. Hong Hua, Craig Pansing, and J. P. Rolland, "Modeling of an eye-imaging system for optimizing illumination schemes in an eye-tracked head-mounted display," *Applied Optics,* 46(31): 7757-70, October 2007 (cover story). This article is also listed in *Virtual Journal for Biomedical Optics*, 2(12).
21. Hong Hua and C. Gao, "Online calibration of a head-mounted projection display for augmented reality systems," *Journal of Society for Information Displays,* 15(11):1-9, 2007.
22. Hong Hua, C. Gao, and N. Ahuja, "Calibration of an augmented reality system using head-mounted projective displays," *IEEE Transactions on Systems, Man, Cybernetics (Part A: Systems)*, 37(3): 416-30, 2007.
23. Hong Hua and C. Gao, "Design of a polarized head-mounted projection display," *Applied Optics*, 46(14): 2600-10, April 2007. This article is also listed in *Virtual Journal for Biomedical Optics*, 2(6).
24. Hong Hua, N. Ahuja, and C. Gao. "Design analysis of a high resolution panoramic camera using conventional imagers and a mirror-pyramid," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 29(2): 356-61, February 2007.
25. Leonard Brown and Hong Hua, "Magic Lenses for augmented virtual environments," *IEEE Computer Graphics and Applications*, 26(4): 64-73, July/August 2006.
26. Hong Hua, Prasana Krishnaswamy, and J. P. Rolland, "Video-based eyetracking methods and algorithms in head-mounted displays," *Optics Express,* 14(10): 4328-50, May 2006.
27. K. Tan, Hong Hua, and N. Ahuja. "Multiview panoramic cameras using a mirror pyramid," *IEEE Transactions on Pattern Analysis and Machine Intelligence,* 26(7): 941-6, July 2004.
28. Hong Hua, Leonard Brown, and C. Gao, "System and interface framework for SCAPE as a collaborative infrastructure," *Presence: Teleoperators and Virtual Environments,* 13(2): 234-250, April 2004 (cover story).
29. Hong Hua, Leonard Brown, and C. Gao, "SCAPE: Supporting Stereoscopic Collaboration in Augmented and Projective Environments," *IEEE Computer Graphics and Application,* 24(1): 66-75, January/February 2004.
30. Hong Hua, Y. Ha, and J. P. Rolland. "Design and assessment of an ultra-light and compact projection lens using DOE and plastic components for head-mounted projective displays," *Applied Optics,* 42(1): 97-107, January 2003.
31. *Hong Hua, Y. Wang, and D. Yan. "Low-cost dynamic rangefinding device based on amplitude-modulated continuous ultrasonic wave," *IEEE Transactions on Instrumentation and Measurements*, 51(2): 362-7, April 2002.
32. Hong Hua, A. Girardot, C. Gao, and J. P. Rolland. "Engineering of head-mounted projective displays," *Applied Optics*, 39 (22): 3814-3824, August 2000.
33. *Hong Hua, Y. Wang, X. Guo. "Design principle and error analysis of 6DOF ultrasonic position and

orientation tracker," *Zidonghua Xuebao/Acta Automatica Sinica*, 26 (6): 840-4, November 2000.

34. *Hong Hua, X. Guo, Y. Wang. "Design principle and error analysis of 3D ultrasonic position tracker," *Chinese Journal of Scientific Instruments*, Vol. 21 (3): 326-330, June 2000 (in Chinese).
35. *Hong Hua, Y. Wang. "Design of position tracker using continuous ultrasonic wave and its application in virtual reality," *Acta Electronica Sinica*, 27 (12): 98-101, December 1999 (in Chinese).
36. *Hong Hua, Y. Wang, T. Xu. "Dynamic rangefinding device using amplitude-modulated continuous ultrasonic wave," *Journal of Beijing Institute of Technology* (English Edition), 7(1): 55-61, 1998.
37. *S. Zhang, Y. Wang, Hong Hua, "Diffraction efficiency calculation of planar grating using rigorous coupled-wave theory," *Optical Techniques*, (1): 2-6, January 1998 (in Chinese).
38. *D. He, Y. Wang, X. Yuang, Hong Hua. "An optical viewing system for virtual reality," *Opto-Electronic Engineering*, 24(5): 41-5, May 1997 (in Chinese).
39. *Y. Wang, Hong Hua, D. He etc. "Technical features of GOLD--software for general optical lens design," *Journal of Beijing Institute of Technology*, 16(5): 483-9, May 1996.

Refereed Proceeding Articles (3~5 peer reviewers) (*Only rigorously peer-reviewed conference articles listed in this category*)

40. Rui Zhang and Hong Hua, "Effects of a Retroreflective Screen on Depth Perception in a Head-mounted Projection Display," Proceedings of 2010 *IEEE and ACM International Symposium on Mixed and Augmented Reality (ISMAR'2010).*
41. Leonard D. Brown and Hong Hua, "An evaluation of physical affordances in augmented virtual environments: Dataset grounding and magic lens," Proceedings of IEEE Virtual Reality 2010, pp. 23-26, March 2010.
42. Sangyoon Lee and Hong Hua, "Effects of viewing conditions and rotation methods in a collaborative tabletop AR environment," Proceedings of IEEE Virtual Reality 2010, pp.163-170, March 2010.
43. **(Best Student Paper Award)** Sheng Liu, Dewen Cheng, and Hong Hua, "An optical see-through head-mounted display with addressable focal planes," *Proceedings of 2008 IEEE and ACM International Symposium on Mixed and Augmented Reality (ISMAR'2008),* pp. 33-42, September 2008 (<15% acceptance rate for full papers).
44. Sheng Liu and Hong Hua, "Spatialchromatic foveation for gaze contingent displays," *Proceedings of the 2008 ACM symposium on Eye Tracking Research and Applications* (ETRA'08), pp. 139-142, March 2008.
45. C. Gao, N. Ahuja, and Hong Hua, "Active aperture control and sensor modulation for flexible imaging," *Proceedings of International Conference on Computer Vision and Pattern Recognition (CVPR'2007),* pp.1-8, June 2007 (<28.2% acceptance rate).
46. Ji-Young Oh and Hong Hua, "User evaluations on form factors of tangible magic lenses," *Proceedings of 2006 IEEE and ACM International Symposium on Mixed and Augmented Reality (ISMAR'2006),* pp.23-32, October 2006 (<26% acceptance rate for full papers).
47. Hong Hua and C. Gao, "A polarized head-mounted projective displays," *Proceedings of 2005 IEEE and ACM International Symposium on Mixed and Augmented Reality,* pp. 32-35, October 2005 (<22% acceptance rate for short papers).
48. Leonard Brown, Hong Hua, and C. Gao, "A widget framework for augmented interaction in SCAPE," *Proceedings of 2003 ACM User Interface of Software and Technology (UIST 2003)*, also in *Computer Human Interaction (CHI) Letters*, 5(2), 1-10, October 2003 (<20% acceptance rate).
49. (**Best Paper Award, Honorable Mention**)Hong Hua, Leonard Brown, and C. Gao, "A new collaborative infrastructure: SCAPE," *Proceedings of IEEE Virtual Reality 2003 (VR'2003)*, pp. 171-179, March 2003 (<28% acceptance rate).
50. C. Gao, Hong Hua, and N. Ahuja, "Easy calibration of a head-mounted projective display for augmented reality systems," *Proceedings of IEEE Virtual Reality 2003 (VR'2003)*, pp. 53-60, March 2003 (<28% acceptance rate).
51. Hong Hua, C. Gao, and N. Ahuja, "Calibration of a head-mounted projective display for augmented reality systems," *Proceedings of 2002 IEEE and ACM International Symposium on Mixed and Augmented Reality*

(ISMAR'2002), pp.176-185, September 2002 (<28% acceptance rate).

52. K. Tan, Hong Hua, N. Ahuja, "Multi-view mirror pyramid panoramic camera," *Proceedings of 2002 IEEE Workshop on Omnidirectional Vision*, pp. 87-93, June 2002.
53. Hong Hua, C. Gao, Leonard Brown, N. Ahuja, and J. P. Rolland, "A testbed for precise registration, natural occlusion and interaction in an augmented environment using a head-mounted projective display (HMPD)," *Proceedings of IEEE Virtual Reality 2002 (VR'2002)*, pp. 81-89, March 2002 (<27% acceptance rate).
54. Hong Hua and N. Ahuja. "A high-resolution panoramic camera," *Proceedings of International Conference on Computer Vision and Pattern Recognition (CVPR'2001)*, pp. 960-67, December 2001 (<30.5% acceptance rate).
55. Hong Hua, C. Gao, Leonard Brown, N. Ahuja, and J. P. Rolland. "Using a head-mounted projective display in interactive augmented environments," *Proceedings of 2001 IEEE and ACM International Symposium on Augmented Reality (ISAR'2001)*, pp. 217-223, October 2001 (<32% acceptance rate).
56. M. Agrawal, Hong Hua, N. Ahuja. "On cosine-fourth and vignetting effects in lenses", *Proceedings of 2001 International Conference on Computer Vision (ICCV'2001)*, pp. 472-479, July 2001 (<34% acceptance rate).
57. Hong Hua, C. Gao, F. Biocca, and J. P. Rolland. "An ultra-light and compact design and implementation of head-mounted projective displays," *Proceedings of IEEE Virtual Reality 2001 (VR'2001)*, pp. 175-182, March 2001 (<30% acceptance rate).

Review Articles

58. Hong Hua, "Merging the worlds of atoms and bits: augmented virtual environments," *Optics and Photonics News, 17(10): 26-33,* October 2006 (cover story).
59. Hong Hua, "Stereoscopic displays," *McGraw-Hill 2005 Yearbook of Science & Technology*, 339-342, 2005.

Media

60. Hong Hua and Sheng Liu, "Correct focus cues in stereoscopic displays improve 3D depth perception," SPIE News Room, July 2010 (10.1117/2.1201007.003109).
61. Hong Hua, Leonard Brown, and C. Gao. "SCAPE: A collaborative interface showcase," *Video Proceedings of UIST 2003*, Vancouver, CA, 2003.
62. Hong Hua, L. Brown, and C. Gao. "Head-mounted projective display technology showcase: augmented 'GO'," *Video Proceedings of IEEE VR 2002,* Orlando, FL, 2002.

Scholarly Presentations

Invited Papers and Talks

63. (Invited Talk) Hong Hua, "Stereoscopic Displays with Addressable Focus Cues",1st Regional Meeting on Optics (CREO-CICESE), Ensenada, Baja California, Mexico, SPIE Visiting Lecture Program, September 8th, 2011.
64. (Invited Talk) Hong Hua, "Near-eye displays for augmented reality applications: now and the future", Google, April 26th, 2011.
65. (Invited Talk) Hong Hua, "Near-eye displays for augmented reality applications," Institute of Computer Graphics Colloquium, Johannes Kepler University, Linz, Austria, January 19th, 2011.
66. (Invited Talk) Hong Hua, "Research on 3D Visualization and Imaging System Development," Beijing Institute Technology, China, October 22nd, 2010.
67. (Invited Paper) Hong Hua and Sheng Liu, "Depth-fused multi-focal plane displays enable accurate depth perception," Proc. of SPIE (Optical Design and Testing IV, Photonics Asia 2010), Vol 7849, 78490P, October 2010.
68. (Invited Paper) Dewen Cheng, Yongtian Wang, and Hong Hua, "Free form optical system design with differential equations," Proc. of SPIE (Optical Design and Testing IV, Photonics Asia 2010), Vol 7849, 78490Q, October 2010.
69. (Invited Paper) Dewen Cheng, Yongtian Wang, and Hong Hua, "Large field-of-view and high resolution

free-form head-mounted display," Proc. of SPIE-OSA (International Optical Design Conference 2010), Vol 7652, 76520D, June 2010.

70. (Invited Paper) Hong Hua, Dewen Cheng, Yongtian Wang, and Sheng Liu, "Near-eye displays: state-of-the-art and emerging technologies," Proc. of SPIE (Three-dimensional Imaging, Visualization, and Display 2010 and Display Technologies for Defense, Security, and Avionics IV), Vol 7690, 769009-1, April 2010.
71. (Invited Talk) Hong Hua, "Near-eye displays: now and future," HP, October 2009.
72. Hong Hua, "Near-eye displays: what is now and future?" 3M Colloquium talk, June 9th, 2009.
73. Hong Hua, "3D visualization techniques in multi-scale collaborative augmented virtual environments," Computer Science Colloquium, University of Arizona, November 16th, 2006.
74. (Invited Paper) Hong Hua, "Display technologies for collaborative work in 3D augmented and virtual environments," *2005 International Symposium on Optical Memory and Optical Data Storage*, Paper MA2, Honolulu, Hawaii, July 10th, 2005.
75. (Invited Paper) Craig Pansing, Hong Hua, and J. P. Rolland, "Optimization of illumination schemes in a head-mounted display integrated with eye tracking capabilities," *Proceedings of the SPIE International Society for Optical Engineering*, Vol. 5875, San Diego, USA, August 2005.
76. Hong Hua, "Stereoscopic display technology for collaborative augmented environments," Visual Communication and Display Lab of Motorola Inc. (Schaumburg, IL), on June 4th 2003.
77. Hong Hua, "Stereoscopic display technology for collaborative augmented environments," Department of Computer Science, George Mason University, Washington DC, on June 2nd, 2003.
78. Hong Hua, "Stereoscopic display research in augmented environments," the Director's Seminar Series, Beckman Institute, University of Illinois at Urbana-Champaign, September 2002.
79. Hong Hua, "Display and imaging methods in augmented reality", the Department of Opto-Electronic Engineering, Beijing Institute of Technology, June 2002.

Submitted/Contributed Non-refereed Articles in Conference Proceedings

80. Hong Hua and Chunyu Gao, "Design of a compact eyetracked optical see-through head-mounted display using freeform optics," SPIE & IST Electronic Imaging Conference, January 2012.
81. (**Distinguished Student Paper Award**) Xinda Hu and Hong Hua, "A depth-fused multi-focal-plane display prototype enabling focus cues in stereoscopic displays," Proc. of 2011 SID International Symposium (Display Week).
82. Rui Zhang and Hong Hua, "Design of a compact light engine for FLCOS microdisplays in a p-HMPD system," *Proceedings of 2008 International Symposium of Society of Information Display* (SID'2008).
83. Sheng Liu, Chunyu Gao, and Hong Hua, "Illumination design of a multi-touch sensing projection screen for augmented virtual environments," *Proceedings of 2008 International Symposium of Society of Information Display* (SID'2008).
84. Rui Zhang and Hong Hua, "Design of a polarized head-mounted projection display using FLCOS microdisplays," *Proceedings of the SPIE International Society for Optical Engineering* (Photonic West 2007), Vol. 6489, 64890B, San Jose, USA, January 2007.
85. Sheng Liu, Craig Pansing, and Hong Hua, "Design of a foveated imaging system using a two-axis MEMS mirror," *Proceedings of 2006 International Optical Design Conference*, Vol. 6342, 63422W-1-W-8, Vancouver, Canada, June 2006.
86. C. Curatu, J.P. Rolland, and Hong Hua, "Dual purpose lens for an eye-tracked projection head-mounted display," *Proceedings of International Optical Design Conference*, Vancouver, Vol. 6342, 63420X, Canada, June 2006.
87. C. Curatu, Hong Hua, and J. P. Rolland, "Projection-based head-mounted display with eye-tracking capabilities," *Proceedings of the SPIE International Society for Optical Engineering*, Vol. 5875, San Diego, USA, August 2005.
88. Hong Hua, "An ultra-bright polarized head-mounted projective display," *OSA 2005 Annual*

Meeting/Frontiers in Optics, Tucson, AZ, October 2005 (Oral presentation).

89. Leonard Brown, C. Gao, and Hong Hua, "Toward a tangible interface for multi-modal interior design using SCAPE," *2004 IEEE Workshop on Beyond glove and wand based interaction*, March 2004.
90. Y. Ha, Hong Hua, R. Martins, and J. P. Rolland, "Design of a wearable wide-angle projection color display," *Proceedings of 2002 International Optical Design Conference*, pp. 67-73, June 2002.
91. Hong Hua, C. Gao, and J. P. Rolland, "Study of the imaging properties of retro-reflective materials used in head-mounted projective displays," *Proceedings of SPIE (Aerosense 2002)*, Vol. 4711, pp.194-201, April 2002.
92. J. P. Rolland, Hong Hua, and F. Biocca, "Head-mounted projective displays for creating remote collaborative environments," *Proceedings of SPIE (Aerosense 2002)*, Vol. 4711, April 2002.
93. Hong Hua, F. Biocca, and J. P. Rolland, "Design of an ultra-light head-mounted projective display and its applications in augmented collaborative environments," *Proceedings of SPIE (Electronic Imaging 2002)*, Vol. 4660, pp.492-497, January 2002.
94. Hong Hua, Leonard Brown, C. Gao, N. Ahuja, J. P. Rolland, F. Biocca. "A head-mounted projective display and its applications in interactive augmented environments," *SIGGRAPH 2001 Conference Abstracts and Applications--Sketches & Applications*, August 2001.
95. (Invited Paper) J. P. Rolland, Y. Ha, L. Davis, Hong Hua, C. Gao, F. Biocca, "A new paradigm for head-mounted display technology: application to medical visualization and remote collaborative environments," *Proceedings of SPIE*, Vol. 4442, August 2001.
96. J. P. Rolland, Hong Hua, C. Gao, and F. Biocca. "Innovative displays for augmented reality applications and remote collaborations", *Proceedings of 2001 Medicine Meets Virtual Reality (MMVR'2001)*, January 2001.
97. Hong Hua. "Integration of eye tracking capability into optical see-through head-mounted displays," *Proceedings of SPIE (Electronic Imaging 2001)*, pp. 496-503, January 2001.
98. Hong Hua, C. Gao, J. P. Rolland. "Ultra-light and compact design of head-mounted projective displays with diffractive optical element," *OSA 2000 Annual Meeting*, October 2000 (Oral presentation).
99. Hong Hua, C. Gao, and J. P. Rolland. "Design and engineering implementation of head-mounted projective display," *Proceedings of 5th International Conference on Human Interaction with Complex Systems*, April 30-May 2, 2000.
100. Hong Hua, A. Girardot, and J. P. Rolland. "Head-mounted projective display: design and engineering study," *OSA 1999 Annual Meeting*, September 1999 (Oral presentation).
101. *Hong Hua, Y. Wang, D. He. "3-D sound techniques in virtual reality," *Transaction on Chinagraph'96*, Publishing House of Electronic Industry, pp. 313-319, September 1996.
102. *D. He, Y. Wang, X. Yuan, Hong Hua. "Design of viewing lens used in head-mounted-display system," *Transaction on Chinagraph'96*, Publishing House of Electronic Industry, pp. 308-312, September 1996.
103. *Y. Wang, X. Yuan, D. He, Hong Hua. "Design of viewing lens for virtual reality," *Proc. Of SPIE* Vol. 2778, pp.71-72, 1996.
104. *D. He, T. Xu, Y. Wang, Hong Hua. "Head-mounted-display system for virtual reality," *Proc. Of SPIE* Vol. 2892, pp.126-128, 1996.
105. *D. He, Y. Wang, Hong Hua. "Prototyping techniques: the application of virtual reality in manufacturing," *Proceedings of Ninth CAD & Computer Graphics of China*, pp.561-567, 1996.

Patents and Patent Applications

1. Hong Hua and Chunyu Gao, "An Ultra-compact eyetracked head-mounted display using freeform optical technology," Provisional Patent Application, 2012.
2. Hong Hua, "Freeform optical waveguide for image capture," Provisional Patent Application, 2011.
3. Hong Hua, "Compact eye-tracked near-eye display using freeform optical technology," Provisional Patent Application, 2011.
4. Hong Hua and Sheng Liu, "3-Dimensional Electro-Optical See-through Displays," US Patent Application, September 2010.

5. Dewen Cheng, Yongtian Wang, and Hong Hua, "Wide angle and high resolution tilted head-mounted display device," PCT/CN2010/072376, April 2010.
6. Hong Hua and Sheng Liu, "Method for real-time, single-shot extended depth of focus microscopic imaging," Provisional Patent application, March 2010.
7. Dewen Cheng, Yongtian Wang, and Hong Hua, "Optical see-through free-form head-mounted display," US/World Patent Application, PCT 61/214,117, University of Arizona, April 2009.
8. Hong Hua and Rui Zhang, "Head-mounted projection display using reflective microdisplay," US/World Patent Application, PCT/US09/031606, University of Arizona, January 2009.
9. Hong Hua, "Polarized head-mounted projection display," United States Patent Application 12/522,262, University of Arizona, January 2008.
10. C. Gao, Hong Hua, and N. Ahuja, "Apparatus and method of acquiring uniform-resolution panoramic images," United States Patent 6,809,887 B1, October 2004.
11. Hong Hua and J. P. Rolland, "Compact lens-assembly for the teleportal augmented reality system," US Patent 6,731,734 B1, May 2004.

Accuracy Statement

This is a true and accurate statement of my activities and accomplishments. I understand that misrepresentation in securing promotion and tenure may lead to dismissal or suspension under ABOR Policy 6-201 J.1.b.

Signature: _____ **Date:**_____