

# Ulrich Neumann

Professor, Computer Science Department, University of Southern California  
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## *Education*

Ph.D. Computer Science, 1993, University of North Carolina at Chapel Hill  
Advisor: Prof. Henry Fuchs  
Dissertation: Parallel Volume Rendering

M.S. Computer Science, 1990, University of North Carolina at Chapel Hill

M.S. Electrical Engineering, 1979, SUNY at Buffalo

B.S. Electrical Engineering, 1976, SUNY at Buffalo

## *Academic Appointments:*

Professor, Computer Science Department, USC Viterbi School of Engineering (2010)

Joint Appointment, Electrical Engineering-Systems, USC Viterbi School of Engineering (2002)

Associate Professor, Computer Science Department, USC Viterbi School of Engineering (2001)

Assistant Professor, Computer Science Dept., University of Southern California (1994)

## *Positions*

Associate Director, ADE projects, USC/Chevron Center for Interactive Smart Oilfield Technologies (CiSOFT) (2010-2012)

Co-Founder and Manager, Sentinel AVE LLC, El Segundo, CA (2005-2012)

Associate Director of Research, Integrated Media Systems Center (IMSC) (2005-2010)

Member, Decision Review Board, USC/Chevron Center for Interactive Smart Oilfield Technologies (CiSOFT) (2003-2006)

Director, Integrated Media Systems Center (IMSC) (2001-2005)

Research Associate Director for Computer Interfaces, for the Integrated Media Systems Center (IMSC), an NSF Engineering Research Center (1996-2001)

Founder and Director of the USC Computer Graphics and Immersive Technologies Laboratory (CGIT) (1994) <http://graphics.usc.edu>

Senior Research Associate, Computer Science, UNC Chapel Hill (June 1993 to July 1994)  
Site-coordinator, NSF/ARPA Science and Technology Center for Computer Graphics and Scientific Visualization (with Caltech, The University of Utah, Cornell University, and Brown University)

Co-Founder and VP of Engineering, Creative Sciences Inc., Santa Ana, CA (1982 to 1985)

### *Awards*

Ten-Year Technical Impact Award from the ACM International Conference on Multimodal Interfaces (Nov. 2014)

Charles Lee Powell Chair in Computer Science and Electrical Engineering, 2002-2005

USC Northrop Grumman Junior Faculty Research Award, 1999

NSF CAREER Award, 1995

### *Refereed Journal Publications*

- J1. Qian-Yi Zhou and Ulrich Neumann, "Complete Residential Urban Area Reconstruction from Dense Aerial LiDAR Point Clouds," *Graphical Models*, Vol. 75, Issue 3, May 2013, pp. 118–125. Special issue on Computational Visual Media. Elsevier Inc.
- J2. Wei Guan, Suyu You and Ulrich Neumann, "Efficient Matching and Mobile Augmented Reality," *ACM Transactions on Multimedia Computing, Communications and Applications (TOMCCAP)*, Volume 8 Issue 3s, Article No. 47, September 2012.
- J3. Taehyun Rhee, J.P. Lewis, Ulrich Neumann, and Krishna Nayak, "Scan-Based Volume Animation Driven by Locally Adaptive Articulated Registrations," *IEEE Transactions on Visualization and Computer Graphics*, Vol. 17, No. 3, pp. 368-379, March 2011. (Selected for oral presentation at *IEEE VR 2011*, March 2011, Singapore.)
- J4. Q. Wang, J. Mooser, S. You, and U. Neumann, "Augmented Exhibitions Using Natural Features," *International Journal of Virtual Reality*, Dec. 2008.
- J5. T. Ju, Q. Y. Zhou, M.V.D. Panne, D. Cohen-Or and U. Neumann, "Reusable Skinning Templates Using Cage-based Deformations," *Proceedings of ACM SIGGRAPH ASIA 2008*, Singapore, Character animation II, Article No. 122, published as *ACM Transactions on Graphics (TOG)*, Volume 27, Issue 5, December 2008.
- J6. Z. Deng and U. Neumann, "Expressive Speech Animation Synthesis with Phoneme-Level Controls," *Computer Graphics Forum (CGF)*, 27(6), September, 2008.
- J7. C. Busso, Z. Deng, M. Grimm, U. Neumann, and S. Narayanan, "Rigid Head Motion in Expressive Facial Animation: Analysis and Synthesis," *IEEE Transaction on Audio, Speech and Language Processing (TASLP)*, 15(3), pp. 1075-1086, March 2007.
- J8. Z. Deng, U. Neumann, J.P. Lewis, T.Y. Kim, M. Bulut, and S. Narayanan, "Expressive Facial Animation Synthesis by Learning Speech Co-Articulation and Expression Spaces", *IEEE Transaction on Visualization and Computer Graphics (TVCG)*, 12(6), pp. 1523-1534, Nov/Dec 2006.
- J9. T. Rhee, J.P. Lewis, U. Neumann, "Real-Time Weighted Pose-Space Deformation on the GPU," *Computer Graphics Forum*, Vol. 25, No. 3, (Eurographics 2006), pp. 439-448, Vienna, Austria, Sept. 2006.
- J10. C. Busso, Z. Deng, U. Neumann, S. Narayanan, "Natural Head Motion Synthesis driven by Acoustic Prosody Features," the *Journal of Computer Animation and Virtual Worlds*, Vol. 16, No. (3-4), pp. 283-290, July 2005, John Wiley Press. (special issue for **best papers** of IEEE Computer Animation and Social Agents 2005)
- J11. Z. Deng, J.P. Lewis, U. Neumann, "Automated Eye Movement using Texture Synthesis", *IEEE Computer Graphics & Applications*, Vol. 25, No. 2, pp. 24-30, March/April, 2005.

- J12. J.P.Lewis, R. Roseholtz, N. Fong, U. Neumann, "VisualIDs: Automatic Distinctive Icons for Desktop Interfaces," *ACM Transactions on Graphics (Proceedings of SIGGRAPH 2004)*, Vol. 23, No. 3, pp. 416-423, Los Angeles, CA, August 2004.
- J13. U. Neumann, S. You, J. Hu, I.O. Sebe, and B. Jiang, "Visualizing Reality in an Augmented Virtual Environment," *PRESENCE: Teleoperators and Virtual Environments* Vol. 13, No. 2, pp. 222-233, April 2004.
- J14. D. Fidaleo and U. Neumann, "Analysis of Co-Articulation Regions for Performance Driven Facial Animation," *Journal of Computer Animation and Virtual Worlds*, Vol. 15, No. 1, pp. 15-26, 2004, John Wiley Press.
- J15. R. Zimmermann, C. Kyriakakis, C. Shahabi, C. Papadopoulos, A. A. Sawchuk, U. Neumann, "The Remote Media Immersion System," *IEEE MultiMedia*, special issue on "Digital Media on Demand," Vol. 11, No. 2, pp. 48-57, April-June 2004.
- J16. J. Hu, S. You, U. Neumann, "Approaches to Large-Scale Urban Modeling," *IEEE Computer Graphics & Applications*, Vol. 23, No. 6, pp. 62-69, November 2003.
- J17. T.Y. Kim and U. Neumann, "Interactive Multiresolution Hair Modeling and Editing," *ACM Transactions on Graphics and Computer Graphics*, proceedings of *ACM SIGGRAPH 2002*, Vol 21, No. 3, pp. 620-629, San Antonio TX, July 2002.
- J18. J.Y. Noh and U. Neumann, "Expression Cloning," *Computer Graphics*, proceedings of *ACM SIGGRAPH 2001*, pp. 277-288, Los Angeles CA, August 2001.
- J19. Y. K. Cho and U. Neumann. "Multi-Ring Fiducial Systems for Scalable Fiducial-Tracking Augmented Reality," *PRESENCE: Teleoperators and Virtual Environments*, Vol. 10, No. 6, pp. 599-612, December 2001.
- J20. AA. Rizzo, U. Neumann, R. Enciso, D. Fidaleo, & JY. Noh. "Performance Driven Facial Animation: Basic Research On Human Judgments Of Emotional State In Facial Avatars," *CyberPsychology and Behavior*. Vol. 4. No. 4, pp. 471-487, 2001.
- J21. Yoon and U. Neumann. "Web-Based Remote Rendering with IBRAC: Image-Based Rendering Acceleration and Compression," *Computer Graphics Forum* (Eurographics 2000), Vol. 19, No. 3, pp. C321-C330, Interlaken, Switzerland, August 2000.
- J22. J.S. McGee, C. van der Zaag, J.G. Buckwalter, M. Thieboux, A. Van Rooyen, U. Neumann, D. Sisemore, A.A. Rizzo, "Issues for the Assessment of Visuospatial Skills in Older Adults Using Virtual Environment Technology," *CyberPsychology & Behavior*. Vol. 3, No. 3, pp. 469-482, Jun 2000.
- J23. A.A. Rizzo, J.G. Buckwalter, T. Bowerly, C. Van Der Zaag, L. Humphrey, U. Neumann, C. Chua, C. Kyriakakis, A. Van Rooyen, D. Sisemore, "The Virtual Classroom: A Virtual Reality

Environment for the Assessment and Rehabilitation of Attention Deficits,” *CyberPsychology & Behavior*, Vol. 3, No. 3, pp. 483-499, Jun 2000.

- J24. Yoon and U. Neumann. “IBRAC: Image-Based Rendering Acceleration and Compression,” *Journal of High Performance Computer Graphics, Multimedia, and Visualization*, Jan. 2000.
- J25. R. Azuma, J. W. Lee, B. Jiang, J. Park, S. You, and U. Neumann. “Tracking in Unprepared Environments for Augmented Reality Systems,” *Computers & Graphics* Vol. 23, No. 6, pp. 787-793, Dec. 1999.
- J26. S. You, U. Neumann, and R. Azuma. “Orientation Tracking for Outdoor Augmented Reality Registration,” *IEEE Computer Graphics & Applications*, Vol. 19, No. 6, pp. 36-42, Nov. 1999.
- J27. U. Neumann, S. You. “Natural Feature Tracking for Augmented Reality,” *IEEE Transactions on Multimedia*, Vol. 1, No. 1, pp. 53-64, March 1999.
- J28. P. Larson, A.A. Rizzo, J.G. Buckwalter, A. Van Rooyen, K. Kratz, U. Neumann, C. Kesselman, M. Thieboux, and C. Van Der Zaag. “Gender Issues in the Application of a Virtual Environment Spatial Rotation Project,” *CyberPsychology and Behavior*. Vol. 2, No. 2, pp. 113-124, 1999.
- J29. U. Neumann and J. Park. “Tracking for Augmented Reality on Wearable Computers,” *Virtual Reality*, Vol. 3, No. 3, pp. 167-175, Springer-Verlag, London Ltd., 1998.
- J30. A.A. Rizzo, J.G. Buckwalter, U. Neumann, C. Kesselman, and M. Thieboux. “Basic Issues in the Application of Virtual Reality for the Assessment and Rehabilitation of Cognitive Impairments and Functional Disabilities,” *CyberPsychology and Behavior*, Vol. 1, No. 1, pp. 59-78, 1998.
- J31. A.A. Rizzo, J.G. Buckwalter, U. Neumann, C. Kesselman, M. Thieboux, P. Larson, and A. Van Rooyan. “The Virtual Reality Mental Rotation/Spatial Skills Project: Preliminary findings,” *CyberPsychology and Behavior*, Vol. 1. No. 2, pp. 107-113, 1998.
- J32. A.A. Rizzo, J.G. Buckwalter, and U. Neumann. “Virtual Reality and Cognitive Rehabilitation,” *The Journal of Head Trauma Rehabilitation*, Vol. 12, No. 6, pp. 1-15, 1997.
- J33. M. Bajura and U. Neumann. “Closed-Loop Tracking for Augmented-Reality Systems,” *IEEE Computer Graphics & Applications*, Vol. 15, No. 5, pp. 52-60, September 1995.
- J34. U. Neumann “Communication Costs for Parallel Volume-Rendering Algorithms,” *IEEE Computer Graphics & Applications*, 14(4):49-58, July 1994. (IF: 2.124) Reprinted in ACM Siggraph'94 course notes: “Advanced Techniques for Scientific Visualization.”

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