James D. Hollan

Curriculum Vitæ

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Education

Stanford University, Artificial Intelligence; Postdoctoral Fellow, 1973-74

University of Florida, Mathematics & Psychology; BS, 1969, MS, 1972, PhD, 1973

Appointments

2021–2022: Research Fellowship, Paris Institute for Advanced Study, France

2017–Present: Distinguished Professor of Cognitive Science, Department of Cognitive Science, UC San Diego

2016 Quarter: Visiting Professor, University of Paris and INRIA

2014–Present: Founding Co-Director, Design Lab, UC San Diego

2009 Quarter: Visiting Professor, Computer Science Division, UC Berkeley

2005 Quarter: Visiting Professor, Computer Science Department, Stanford University

1997–Present: Professor, Department of Cognitive Science & Department of Computer Science and Engineering, UC San Diego

1997–2014: Founding Co-Director, Distributed Cognition and Human-Computer Interaction Lab, UC San Diego

1993–1997: Professor and Chair, Computer Science Department, University of New Mexico

1989–1993: Director, Computer Graphics and Interactive Media Research Group, Bellcore

1987-1989: Director, Human Interface Laboratory, Microelectronics and Computer Technology Corporation (MCC)

1977–1987: Lecturer to Associate Research Cognitive Scientist, UC San Diego and Director, Future Technologies, NPRDC

1974–1977: Assistant Professor, Departments of Computer Science and Psychology, Clarkson University

Major Awards

ACM SIGCHI Lifetime Research Award (2015)

The SIGCHI Lifetime Research Award is presented to individuals for outstanding contributions to the study of human-computer interaction. This award recognizes the very best, most fundamental and influential research contributions. It is awarded for a lifetime of innovation and leadership. The criteria for the award are cumulative contributions to the field, influence on the work of others, and development of new research directions.

ACM SIGCHI Academy (2003)

The CHI Academy is an honorary group of individuals who have made extensive contributions to the study of HCI and who have led the shaping of the field.

Publications

130. Amy R. Fox and James D. Hollan, *Visualization Psychology: Foundations for an Interdisciplinary Reserarch Programme.* Chapter in Visualization Psychology, Danielle Albers Szafir (Ed.), in press.

129. Krishna Subramanian, Johannes Maas, Jan Borchers, and James D. Hollan. *From Detectables to Inspectables: Understanding Qualitative Analysis of Audiovisual Data.* In Proceedings of the 2021 ACM Conference on Human Factors in Computing Systems, CHI 2021, ACM, May 2021. (Honorable Mention Award.)

128. Amy Rae Fox, Philip Guo, Clemens Nylandsted Klokmose, Arvind Satyanarayan, Haijun Xia, and James D. Hollan, *Towards a Dynamic Multiscale Personalized Information Space*, Convivial Computing Salon 2020, <Programming'20>, 2020.

127. Amy R. Fox, Caren M. Walker, and James D. Hollan. *When Graph Comprehension Is An Insight Problem*, Conference Proceedings of the Annual Meeting of The Cognitive Science Society, 2019.

126. Amy Rae Fox and James D. Hollan. *Read It This Way: Scaffolding Comprehension for Unconventional Statistical Graphs*, International Conference on Theory and Application of Diagrams, 441-457, 2018.

125. Amy R. Fix, Caren M. Walker, and James D. Hollan. *Graphical Insight: How to Read an Unconventional Graph*, In Conference of the European Association for Research on Learning & Instruction, SIG2 Text & Graphics Comprehension. Freiburg, Germany, 2018.

124. Adam Rule, Ian Doros, Aurélien Tabard, and James D. Hollan. *Aiding Collaborative Reuse of Computational Notebooks with Annotated Cell Folding*, Proceedings of ACM Human-Computer Interaction, 150:1-150:12, 2018.

123. Adam Rule, Aurélien Tabard, and James D. Hollan. *Exploration and Explanation in Computational Notebooks*, Proceedings of CHI 2018, 32:1–32:12, 2018.

122. Adam Rule, Aurélien Tabard, and James D. Hollan. *Using Visual Histories to Reconstruct the Mental Context of Suspended Activities*, Human-Computer Interaction, 1-48, 2017.

121. Karen Boyd, Adam Rule, Aurélien Tabard, and James D. Hollan. *Sharing, Human Values, and Computer Activity Tracking*, Proceedings of ACM Computer Supported Cooperative Work and Social Computing, 233-236, 2016.

120. Adam Rule, Aurélien Tabard, and James D. Hollan. *Thinking in 4D*, Proceedings of ACM Computer Supported Cooperative Work and Social Computing, 389-392, 2016.

119. Adam Rule, Aurélien Tabard, and James D. Hollan. *Traces: A Flexible, Open-Source Activity Tracker for Workplace Studies*, Quantified Workplace, ACM Computer Supported Cooperative Work and Social Computing, 1-6, 2016.

118. Nadir Weibel, So-One Hwang, Stven Rick, Erfin. Sayyari, Dan Lenzen, and James D. Hollan. *Hands that Speak: An Integrated Approach to Studying Complex Human Communicative Body Movements*, Proceedings of HICSS-49, Hawaii International Conference on System Sciences, Kauai, HI, 610-619, 2016.

117. James D. Hollan. *Thinking with Computers*, SIGCHI Lifetime Research Award, Proceedings of CHI'15, ACM Conference on Human Factors in Computing Systems, Seoul, Korea, 817-820, 2015.

116. Adam Rule, Aurélien Tabard, Karen Boyd, and James D. Hollan. *Restoring the Context of Interrupted Work with Desktop Thumbnails*, Proceedings of the 37th Annual Meeting of the Cognitive Science Society, 2045-2050, 2015.

115. Nadir Weibel and James D. Hollan. *Gesture and Action Recognition, Panel on Sensing Technologies*, Abstracts of ISGS: International Society of Gestures Studies, San Diego, USA, July 2014.

114. Anne Marie Piper, Nadir Weibel, and James D. Hollan. *Designing Audio-Enhanced Paper Photos for Older Adult Emotional Wellbeing in Communication Therapy*, International Journal of Human-Computer Studies, 629-639, 2014.

113. Jennifer Lyons, Ram Dixit, Colleen Emmenegger, Linda L. Hill, Nadir Weibel, and James D. Hollan. *Factors affecting physician-patient communication in the medical exam*, Proceedings of HCI International 2013, 15th International Conference on Human-Computer Interaction, 187-191, 2013.

112. Nadir Weibel, Colleen Emmenegger, Jennifer Lyons, Ram Dixit, Linda L. Hill, and James D. Hollan. *Interpreter-Mediated Physician-Patient Communication: Opportunities for Multimodal Healthcare Interfaces*, Proceedings of PervasiveHealth 2013, International Conference on Pervasive Computing Technologies for Healthcare, Venice, Italy, 113-120, 2013.

111. Nadir Weibel, Shazia Ashfaq, Alan Calvitti, Zia Agha, and James D. Hollan. *Multimodal Data Analysis and Visualization to Study Usability of Electronic Health Records*, Proceedings of PervasiveHealth 2013, International Conference on Pervasive Computing Technologies for Healthcare, Venice, Italy, May 2013.

110. Adam Fouse, Nadir Weibel, Chris Johnson, and James D. Hollan. *Reifying Social Movement Trajectories*, Proceedings of CHI'13, ACM Conference on Human Factors in Computing Systems, Paris, France, 2945-2948, 2013.

109. Yang Liu, Nadir Weibel, and James D. Hollan. *Interactive Space: A Framework for Prototyping Multitouch Interaction On and Above the Desktop*, Proceedings of CHI 2013, ACM Conference on Human Factors in Computing Systems, Paris, France, May 1233-1238, 2013.

108. Anne Marie Piper, Nadir Weibel, and James D. Hollan. *Audio-Enhanced Paper Photos: Encouraging Social Interaction at Age 105*, Proceedings of CSCW'13, ACM Conference on Computer Supported Cooperative Work and Social Computing, San Antonio, TX, USA, 215-224, 2013.

107. Anne Marie Piper, Sarah D'Angelo, and James D. Hollan. *Going Digital: Understanding Paper and Photo Documentation Practices in Early Childhood Education*, Proceedings of ACM Conference on Computer-Supported Cooperative Work (CSCW 2013), 1319-1328, 2013.

106. James D. Hollan. *Activity-Enriched Computing: Capturing and Mining Activity Histories*, Computer, 84-87, 2012.

105. Matthew Hong, Anne Marie Piper, Nadir Weibel, Simon Olberding, and James D Hollan. *Microanalysis of Active Reading Behaviors to Inform Design of Interactive Desktop Workspaces*, Proceedings of ITS'12, ACM Conference on Interactive Tabletops and Surfaces, Cambridge, MA, USA, 215-224, 2012.

104. Aleksandra Sarcevic, Nadir Weibel, Randall Burd, and James D. Hollan. *TraumaPen: A Paper-Digital Interface for Information Capture and Display in Time-Critical Medical Work*, Proceedings of PervasiveHealth 2012, International Conference on Pervasive Computing Technologies for Healthcare, San Diego, CA, USA, 17-24, 2012.

103. Nadir Weibel, Adam Fouse, Colleen Emmenegger, Whitney Friedman, Edwin Hutchins, and James D. Hollan. *Digital Pen and Paper Practices in Observational Research*, Proceedings of CHI 2012, ACM Conference on Human Factors in Computing Systems, Austin, TX, USA, 1331-1340, 2012.

102. Anne Marie Piper, Whitney Friedman, and James D. Hollan. *Setting the Stage for Embodied Activity: Small Groupd Discussion around a Multitouch Tabletop Display*, International Journal of Learning Technology, 7, 58-78, 2012.

101. Anne Marie Piper, Nadir Weibel, and James D. Hollan. *TAP & PLAY: An End-User Toolkit for Authoring Interactive Pen and Paper Language Activities*, Proceedings of CHI 2012, ACM Conference on Human Factors in Computing Systems, Austin, TX, USA, 149-158, 2012.

100. Arvind Satyanarayan, Nadir Weibel and James D. Hollan. *Using Overlays to Support Collaborative Interaction with Display Walls*, Proceedings of IUI 2012, International Conference on Intelligent User Interfaces, Lisbon, Portugal, 105-108, 2012.

99. Anne Marie Piper, Nadir Weibel and James D. Hollan. *A Pen-Based Toolkit for Authoring Collaborative Language Activities*, Extended Abstracts of CSCW 2012, Seattle, USA, 269-270, 2012.

98. Anne Marie Piper, Nadir Weibel, and James D. Hollan. *Write-N-Speak: A System for Authoring Multimodal Paper-Digital Materials for Speech-Language Therapy*, ACM Transactions on Accessible Computing (TACCESS), 2011.

97. Anne Marie Piper and James D. Hollan. *Supporting Medical Communication for Older Patients with a Shared Touch-Screen Computer*, International Journal of Medical Informatics, 242-250, 2011.

96. Lisa Cowan, Nadir Weibel, Laura Pina, William Griswold, and James D. Hollan. *Projector Phone Use: Practices and Social Implications*, Journal of Personal and Ubiquitous Computing theme issue on Personal Mobile Projection, 53-63, 2011.

95. Lisa Cowan, Nadir Weibel, Laura Pina, William Griswold, and James D. Hollan. *Ubiquitous Sketching for Social Media*, Proceedings of ACM Conference on Human Computer Interaction with Mobile Devices and Services (MobileHCI), 395-404, 2011.

94. Nadir Weibel, Adam Fouse, Edwin Hutchins, and James D. Hollan. *Supporting an Integrated Paper-Digital Workflow for Observational Research*, Proceedings of the 16th International Conference on Intelligent User Interfaces (ACM IUI'11), 2011, 257-266.

93. Adam Fouse, Nadir Weibel, Edwin Hutchins, and James D. Hollan. *ChronoViz: A System for Supporting Navigation of Time-Coded Data*, (CHI EA '11), 2011, 299-304.

92. Jürgen Steimel, Nadir Weibel, Simon Olberdling, Max Mühlhäuser, and James D. Hollan. *PLINK: Paper-Based LINKS for Cross-Media Information Spaces*, (ACM CHI EA '11), 2011, 1969-1974.

91. Nadir Weibel, Lisa Cowan, Laura Pina, William Griswold, and James D. Hollan. *Enabling Social Interactions Through Real-Time Sketch-Based Communication*, (ACM UIST '10), 2010, 405-406.

90. Nadir Weibel, Anne Marie Piper, and James D. Hollan. *Exploring Pen and Paper Interaction with High-Resolution Wall Displays*, (ACM UIST'10), 2010, 455-456.

89. Jürgen Steimel, Mohammadreza Khalilbeigi, Max Mühlhäuser, and James D. Hollan. *Physical and Digital Media Usage Patterns on Interactive Tabletop Surfaces.* Proceedings of ACM International Conference on Interactive Tabletops and Surfaces (ITS 2010), 2010, 167-176.

88. Anne Marie Piper, Nadir Weibel, and James D. Hollan. *Introducing Multimodal Paper-Digital Interfaces for Speech-Language Therapy* Proceedings of the 12th International Conference on Computers and Accessibility (ACM ASSETS 2010), 2010, 203-210.

87. Lisa Cowen, William G. Griswold, and James D. Hollan. *Applications of Projector Phones for Social Applications* Proceedings of Ubiprojection Workshop, Pervasive, 2010.

86. Anne Marie Piper, Ross Campbell, and James Hollan. *Exploring the Accessibility and Appeal of Surface Computing for Older Adult Health Care Support* Proceedings of the 28th International Conference on Human Factors in Computing Systems (ACM CHI2010), 2010, 907-916.

85. Lisa Cowan, William Griswold, Louise Barkhuus, and James Hollan. *Engaging the Periphery for Communication on Mobile Phones* Hawaii International Conference on System Science (HICSS), 2010.

84. James D. Hollan and Edwin L. Hutchins. *Opportunities and Challenges for Augmented Environments: A Distributed Cognition Perspective*, In Designing User Friendly Augmented Environments: From Meeting Rooms to Digital Collaborative Spaces, Saadi Lahlou (Ed,), Springer, 2010, 237-259.

83. Amaya Becvar Weddle and James D. Hollan. *Scaffolding Embodied Practices in Professional Education*, Mind, Culture, and Activity: An International Journal, 17, 2010, 119-148.

82. Malte Weiss, James D. Hollan, and Jan Borchers *Augmenting Interactive Tabletops with Translucent Tangible Controls*, In Tabletops - Horizontal Interactive Displays, Christian Müller-Tomfeld (Ed.), 2010, 157-180.

81. Gaston R. Cangiano and James D. Hollan. *Capturing and Restoring the Context of Everyday Work: A Case Study at a Law Office*, Proceedings of the 1st International Conference on Human Centered Design: Held as Part of HCI International 2009, (ACM HCII HCD 09), 2009, 945-954.

80. Ann Marie Piper and James D. Hollan. *Analyzing Multimodal Communication around a Shared Tabletop Display*, Proceedings of the European Conference on Computer Supported Cooperative Work (ECSCW), 2009, 283-302.

79. Ann Marie Piper and James D. Hollan. *Tabletop Displays for Small Group Study: Affordances of Paper versus Digital Materials*, Proceedings of the 27th International Conference on Human Factors in Computing Systems (ACM CHI2009), 2009, 1227-1236.

78. Malte Weiss, Julie Wagner, Yvonne Jansen, Roger Jennings, Ramsin Khoshabeh, James D. Hollan, Jan Borchers. *SLAP Widgets: Bridging the Gap Between Virtual and Physical Controls on Tabletops*, Proceedings of the 27th International Conference on Human Factors in Computing Systems (ACM CHI2009), 2009, 481-490.

77. Malte Weiss, Julie Wagner, Roger Jennings, Yvonne Jansen, Ramsin Khoshabeh, James D. Hollan, and Jan Borchers. *SLAPbook: Tangible Widgets on Multi-touch Tables in Groupware Environments*, In TEI'09: Proceedings of the 3rd international conference on Tangible and embedded interaction, 2009, 297-300.

76. Ramsin Khoshabeh and James D. Hollan. *Spatio-Temporal Interest Points for Video Analysis*, Proceedings of the 27th International Conference on Human Factors in Computing Systems (ACM CHI 2009), 3455-3460.

75. Timothy Sohn, Kevin A. Li, William G. Griswold, and James D. Hollan. *A Diary Study of Mobile Information Needs*, CHI 2008: ACM Conference on Human Factors in Computing Systems, 2008, 433-442

74. Amaya Becvar, James Hollan, and Edwin Hutchins. *Representational Gestures as Cognitive Artifacts for Developing Theories in a Scientific Laboratory*, In Resources, Co-Evolution, and Artifacts: Theory in CSCW, Ackerman, M.S., Halverson, C.A., Erickson, T., and Kellogg, W.A. (Eds.), 2008, 117-143.

73. Malte Weiss, Roger Jennings, Julie Wagner, Ramsin Khoshabeh, Jan Borchers, and James D. Hollan. *SLAP: Silicone Illuminated Active Peripherals*, IEEE Tabletops and Interactive Surfaces, 2008, 37-38.

72. Kevin A. Li, Patrick Baudisch, William G. Griswold, and James D. Hollan. Tapping and Rubbing: Exploring New Dimensions of Tactile Feedback with Voice Coil Motors UIST 2008: ACM Symposium on User Interface Software and Technology, 2008, 181-190.

71. Anne Marie Piper and James D. Hollan. Supporting Medical Conversations Between Deaf and Hearing Individuals with Tabletop Displays CSCW 2008: ACM Computer Supported Cooperative Work, 147-156.

70. Malte Weiss, Roger Jennings, Julie Wagner, Ramsin Khoshabeh, Jan Borchers, and James D. Hollan. *SLAP: Silicone Illuminated Active Peripherals*, IEEE Tabletops and Interactive Surfaces, 2008, 37-38.

69. Chunyuan Liao, Francois Guimbretière, Ken Hinckley, and James D. Hollan. *Papiercraft: A Gesture-Based Command System for Interactive Paper*, ACM Transactions on Computer-Human Interaction, 14:4, 1-27, 2008.

68. Timothy Sohn, Kevin A. Li, William G. Griswold, and James D. Hollan. *A Diary Study of Mobile Information Needs*, CHI2008: Proceedings of ACM Conference on Human Factors in Computing Systems, 433-442, 2008.

67. Kevin A. Li, Patrick Baudisch, William G. Griswold, and James D. Hollan. *Tapping and Rubbing: Exploring New Dimensions of Tactile Feedback with Voice Coil Motors*, UIST 2008: Proceedings of ACM Symposium on User Interface Software and Technology, 181-190, 2008.

66. Anne Marie Piper and James D. Hollan. *Supporting Medical Conversations Between Deaf and Hearing Individuals with Tabletop Displays*, CSCW 2008: Proceedings of ACM Computer Supported Cooperative Work,147-156, 2008.

65. Amaya Becvar, James D. Hollan, and Ed Hutchins, *Representational Gestures for Developing Theory in a Scientific Laboratory*, book chapter, In Artifacts in Workplace Practice, Kluwer Academic Publishers, 2008.

64. Saeko Nomura, Hiroshi Tamura, and James D. Hollan. *Information Management Centers in Everyday Home Life*, Proceedings of HCI International, 11th International Conference on Human-Computer Interaction, 2005.

63. Amaya Becvar, James D. Hollan, and Ed Hutchins, *Hands as Molecules: Representational Gestures for Developing Theory in Scientific Activity*, Semiotica, 156, 89-112, 2005.

62. Dan Bower, Pierre Fastrez, and James D. Hollan. *Spatial Tools for Managing Information Collections*, Proceedings of Hawaii International Conference on System Science, 2005.

61. Erwin R. Boer, Carrie A. Joyce, Deborah Forster, Monal Chokshi, Tayopa Mogilner, and James D. Hollan. *Bridging Ethnography and Engineering through the Graphical Language of Petri Nets*, 5th International Conference on Methods and Techniques in Behavioral Research, The Netherlands, 2005.

60. Amaya Becvar and James D. Hollan, *Envisioning a Paper-Augmented Digital Notebook: Exploiting Digital Pen Technology for Fieldwork*, Poster, 9th European Conference on Computer-Supported Cooperative Work, poster, 2005.

59. Erwin R. Boer, Carrie A. Joyce, Deborah Forster, Jean-Baptiste Haue, Monal Chokshi, Tayopa Mogilar, Elaine Garvey, and James D. Hollan. *Mining for Meaning in Drivers' Behavior: A Tool for Situated Hypothesis Generation and Verification*, 5th International Conference on Methods and Techniques in Behavioral Research, The Netherlands, 2005.

58. Ryan Y. Sit, James D. Hollan, and William G. Griswold, *Digital Photos as Conversational Anchors*, Proceedings of Hawaii International Conference on System Science, 2005

57. Joel C. McCall, Ofer Achler, Mohan M. Trivedi, Jean-Baptiste HauÃ©, Pierre Fastrez, Deborah Forster, and James D. Hollan, *A Collaborative Approach for Human-Centered Driver Assistance Systems*, Proceedings of IEEE Conference on Intelligent Transportation Systems, October, 2004.

56. Daniel Bauer, Pierre Fastrez, and James D. Hollan, *Computationally-Enriched "Piles" for Managing Digital Photo Collections*, Proceedings of Visual Languages and Human-Centric Computing, Rome, Italy, September 26-29, 2004.

55. Daniel Bauer and James D. Hollan. IRYS: A Visualization Tool for Temporal Analysis of Multimodal Interactions, *Proceedings of the ACM 5th International Conference on Multimodal Interfaces*, Vancouver, British Columbia, Canada. 285-288, 2003.

54. Wakefield Scott Stornetta and James D. Hollan, *Device and Method for Mediating Access*, US Patent Application 20020144136, 2002.

53. James D. Hollan, Edwin L. Hutchins, and David Kirsh. Distributed cognition: Toward A new theoretical foundation for human-computer interaction research. In J. M. Carroll, editor, *Human-Computer Interaction in the New Millennium*, 75–94. Addison-Wesley, 2001. (This is a revised version of our TOCHI article)

52. Jon I. Helfman and James D. Hollan. Image representations for accessing and organizing web information, in *Proceedings of the SPIE International Society for Optical Engineering Internet Imaging II Conference*, 91–101, 2001.

51. James Hollan and Scott Stornetta. Asynchronous negotiated access. In S. McDonald, Y. Waern, G. Cockton, editors, *Human Computer Interaction 2000*, 17–26, 2000.

50. James D. Hollan, Edwin L. Hutchins, and David Kirsh. Distributed cognition: A new theoretical foundation for human-computer interaction research. *ACM Transactions on Human-Computer Interaction*, 7, 174–196, 2000.

49. James D. Hollan. Human-computer interaction. In R. A. Wilson and F. C. Keil, editors, *Encyclopedia of the Cognitive Sciences*. 379-381, MIT Press, 1999.

48. Ron R. Hightower, Laura Ring, Jon Helfman, Benjamin B. Bederson, and James D. Hollan. Graphical multiscale web histories: A study of PadPrints. In *Proceedings of ACM Conference on Hypertext (Hypertext 98)*, 58–65. ACM Press, 1998.

47. Benjamin B. Bederson, James D. Hollan, Jason Stewart, David Rogers, David Vick, Laura Ring, E. Grose, and C. Forsythe. A zooming web browser. In C. Forsythe, J. Ratner, and E. Grose, editors, *Human Factors in Web Development*, 255–266. Lawrence Erlbaum, 1998.

46. James D. Hollan, Benjamin B. Bederson, and Jon Helfman. Information visualization. In M. G. Helenader, T. K. Landauer, and P. Prabhu, editors, *The Handbook of Human Computer Interaction*, 33–48. Elsevier Science, The Netherlands, 1997.

45. Allison Druin, Jason Stewart, David Proft, Benjamin Bederson, and James Hollan. KidPad: A design collaboration between children, technologists, and educators. In *Proceedings of ACM CHI 97 Conference on Human Factors in Computing Systems*, volume 1 of *Design Briefings: Understanding Users*, 463–470, 1997.

44. N. Wardrip-Fruin, Jon Meyer, Ken Perlin, Benjamin B. Bederson, and James D. Hollan. A multiscale narrative: Grey matters. In *ACM Visual Proceedings of Computer Graphics (Siggraph 97)*, 141. ACM Press, 1997.

43. Benjamin B. Bederson, James D. Hollan, Ken Perlin, Jon Meyer, David Bacon, and George Furnas. Pad++: A zoomable graphical sketchpad for exploring alternate interface physic. *Journal of Visual Languages and Computing*, 7:3–31, 1996.

42. Brad Myers, James Hollan,and Isabel Cruz. Strategic directions in human-computer interaction. *ACM Computing Surveys*, 28(4):794–809, 1996.

41. Benjamin B. Bederson, James D. Hollan, Jason Stewart, David Rogers, Allison Druin, and David Vick. A zooming Web browser. In *Proceedings of the SPIE — The International Society for Optical Engineering*, 260–271, 1996.

40. Benjamin B. Bederson, James D. Hollan, Allison Druin, Jason Stewart, David Rogers, and David Proft. Local tools: An alternative to tool palettes. In *Proceedings of the Ninth Annual Symposium on User Interface Software and Technology*, 169–170, New York: ACM Press, 1996. Press.

39. Benjamin B. Bederson, James D. Hollan, Jason Stewart, David Rogers, Allison Druin, David Proft, and Mohammad Ijadi. Pad++: A zooming web browser. In *Proceedings of ACM User Interface Software and Technology Conference (UIST 96)*. ACM Press, 1996.

38. Benjamin B. Bederson and James D. Hollan. Pad++: A zooming graphical interface system. In *Proceedings of ACM CHI'95 Conference on Human Factors in Computing Systems*, volume 2 of *Demonstrations: Information Navigation/Usability*, 23–24, 1995.

37. William C. Hill and James D. Hollan. History-enriched digital objects: Prototypes and policy issues. *The Information Society*, 10:139–145, 1994.

36. Benjamin B. Bederson, Larry Stead, and James D. Hollan. Pad++: Advances in multiscale interfaces. In *Proceedings of ACM CHI'94 Conference on Human Factors in Computing Systems*, volume 2 of *Short Papers: Virtual and Visual Environments*, 315–316, 1994.

35. Benjamin B. Bederson and James D. Hollan. Pad++: A zooming graphical interface for exploring alternate interface physics. In *Proceedings of the ACM Symposium on User Interface Software and Technology*, 17–26, 1994.

34. William C. Hill and James D. Hollan. History-enriched digital objects. In *Proceedings of the ACM Conference on Computers, Freedom and Privacy*, 9.16–9.20. ACM Press, 1993.

33. Laurence Brothers, James Hollan, Jakob Nielsen, Scott Stornetta, Steve Abney, George Furnas, and Michael Littman. Supporting informal communication via ephemeral interest groups. In *Proceedings of ACM CSCW'92 Conference on Computer-Supported Cooperative Work*, 84–90, 1992.

32. James D. Hollan and Scott Stornetta. Beyond being there. In *Proceedings of ACM CHI'92 Conference on Human Factors in Computing Systems*, Perspectives on the Design of Collaborative Systems, 119–125, 1992.

31. William C. Hill, James D. Hollan, Dave Wroblewski, and Tim McCandless. Edit wear and read wear. In *Proceedings of ACM CHI'92 Conference on Human Factors in Computing Systems*, 3–9, 1992.

30. William C. Hill and James D. Hollan. Pointing and visualization. In *Proceedings of ACM CHI'92 Conference on Human Factors in Computing Systems*, 665–666, 1992.

29. James D. Hollan. Visualizing information. *Bellcore Exchange*, 1992.

28. Bill Curtis, Roy Kuntz, James Hollan, S. Joy Mountford, and George Collier. Retrospective on the MCC human interface laboratory. In *Proceedings of ACM CHI'91 Conference on Human Factors in Computing Systems*, Panels, 373–376, 1991.

27. James D. Hollan and Michael D. Williams. The craft of exploiting AI techniques in human interface design. In *American Association for Artificial Intelligence Tutorial Notes*, 1–90, 1991.

26. William C. Hill and James D. Hollan. Deixis and the future of visualization excellence. In *Visualization '91*, 314–320, 1991.

25. James D. Hollan, E. Rich, William C. Hill, D. Wroblewski, W. Wilner, K. Wittenburg, J. Grudin, and the MCC Human Interface Lab Members. An introduction to HITS: Human interface tool suite. In J. Sullivan, editor, *Intelligent User Interfaces*, pages 293–338. Addison Wesley, 1991.

24. James D. Hollan. User models and user interfaces: A case for domain models, task models, and tailorability. In *Proceedings of AAAI-90*, 1990.

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22. Edwin L. Hutchins, James D. Hollan, and Donald A. Norman. Direct manipulation interfaces. In Norman, D.A. and S. W. Draper, editors, *User Centered System Design: New Perspectives on Human-Computer Interaction*, 87–124. Lawrence Erlbaum Associates, 1986.

21. Henry. M. Halff, James D. Hollan, and Edwin L. Hutchins. Cognitive science and military training. *American Psychologist*, 1131–1140, 1986.

20. James D. Hollan. Review of artificial intelligence: The very idea by John Haugeland. *Contemporary Psychology*, 31:971–972, 1986.

19. James D. Hollan, L. Weitzman, and M. Rosenstein. Interface design for simulations. In *Proceedings of the First Annual Artificial Intelligence and Advanced Computer Technology Conference*, 357–368, 1985.

18. Edwin L. Hutchins, James D. Hollan, and Donald A. Norman. Direct Manipulation Interfaces. *Human-Computer Interaction*, 1:311–338, 1985.

17. James D. Hollan, Edwin L. Hutchins, and Louis Weitzman. Steamer: An interactive inspectable simulation-based training system. *AI Magazine*, 5(2):15–27, 1984.

16. James D. Hollan. Intelligent object-based graphical interfaces. In G. Salvendy, editor, *Human Computer Interaction*, pages 293–297, 1984.

15. James D. Hollan, Edwin L. Hutchins, M. Rosenstein, and L. Weitzman. Tools for graphical interface design. In G. Kohl and S. Nassau, editors, *Combining Human and Artificial Intelligence: A New Frontier in Human Factors*, 24–40. 1984.

14. Michael D. Williams, James D. Hollan, and Al Stevens. Human reasoning about a simple physical system. In D. Gentner and Al Stevens, editors, *Mental Models*, pages 131–153. Hillsdale, NJ: Lawrence Erlbaum Associates, 1982.

13. James D. Hollan, Michael D. Williams, and Al Stevens. An overview of Steamer. *Behavior Research Methods and Instrumentation*, 13:85–90, 1981.

12. Michael D. Williams and James D. Hollan. The process of retrieval from very long term memory. *Cognitive Science*, 5:87–119, 1981.

11. James D. Hollan, Al Stevens, and Michael D. Williams. Steamer: An advanced computer-assisted instruction system for propulsion engineering. In *Proceedings of Summer Computer Simulation Conference*, pages 400–404. Society for Computer Simulation, 1980.

10. James D. Hollan and Mark R. Wallen. The LNR Laboratory. *Behavior research methods and instrumentation*, 11:151–155, 1979.

9. James D. Hollan and Ken L. Bowles. An introduction to UCSD PASCAL: A (nearly) machine independent software system for micro and mini computers. *Behavior Research Methods and Instrumentation*, 10:531–534, 1978.

8. James D. Hollan and Ken L. Bowles. Microcomputer-based mass education. In *Proceedings of Conference on Micro-computers in Education and Training.*, 1978.

7. James D. Hollan. On the use of a cross-assembler, compiler (PL-11), and simulator with the LSI-11. In *Proceedings of the Fall Decus Computer Symposium.*, 1977.

6. James D. Hollan. Features and semantic memory: Set-theoretic or network model? *Psychological Review*, 82:154–155, 1975.

5. James D. Hollan and Robert E. Osteen. ProjectX: A program for processing acyclic digraphs. *Behavior Research Methods and Instrumentation*, 105–106, 1975.

4. James D. Hollan. A graph-theoretical analysis of Kelley's repertory grid. *Behavior Research Methods and Instrumentation*, 7:382, 1975.

3. James D. Hollan. Clarification of some effects of hierarchical organization upon free recall. *Psychological Reports*, 34:1227–1231, 1974.

2. James D. Hollan. A model of epistemological structure in mathematics. In W. L. Vogt and M. H. Mickle, editors, *Modeling and Simulation*. Pittsburgh School of Engineering, University of Pittsburgh, 1974.

1. James D. Hollan. Some effects of epistemological structure on memory. *Memory and Cognition*, 2:670–676, 1974.

Research Funding (Since returning to UCSD in 1997)

2020–Present: Microsoft Research Gift ($50,000, 4 SurfaceHub2 50" displays, and 2 HoloLens2)

2017–2021: NSF, NRT-IGE: Augmenting, Piloting, and Scaling Computational Notebooks to Train New Graduate Researchers in Data-Centric Programming ($498,751)

2014–Present: Unrestricted gift research funding to Design Lab from SAP, Nissan, and Toyota ($800K)

2014–2016: Chancellor's Interdiscipinary Collaboratories, American Sign Language with Depth Data Representation and Recognition ($125,000)

2013–2017: NSF, Activity-Enriched Computing ($499,976)

2010–2012: INRIA, SIRIUS: Situated Interaction Research at INRIA, UC San Diego, and Stanford ($60,000)

2009–2011: NSF, Augment to A Multiscale Framework for Analyzing Activity Dynamics ($149,844)

2008-2011: NSF, Development of Instrumentation for Project GreenLight ($2,600,000)

2008-2009: Chancellor's Interdiscipinary Collaboratories, Visualizing Cultural Patterns ($60,000)

2007–2011: NSF, A Multiscale Framework for Analyzing Activity Dynamics ($975K)

2007–2009: UC MICRO 07-067, The Campus of the Future: A Research and Education Textbed for Ubiquitous Computing ($159,681)

2007-2009: NSF, Graduate Student Symposium at ACM Creativity and Cognition Conference ($134,551)

2007–2008: NSF, Planning for a Center for Software-Intensive Ultra-Large-Scale Systems ($10,000)

2007–2009: Chancellor's Interdiscipinary Collaboratories, Assistive Listening Devices ($120,000)

2002–2005: Nissan Research Center and UC Digital Media Innovation Program, Human-Centered Intelligent Driver Support Systems: A Novel Multimodal Driving Ecology for Enhanced Safety ($1.3M)

2001–2005: NSF, Image-Based Access and Organization of Information ($325K)

1999–2002: NSF, A Distributed Cognition Approach to Designing Digital Work Materials For Collaborative Workspaces ($1.6M)

1998–2002: Intel Gift, Active Multiscale Information ($100K)

1994–1998 DARPA, Beyond Imitation: A Strategy for Building a New Generation of HCI Design Environments ($3.7M)

1994–1997 NSF, Effective Information Access: Computer Science Research Fundamental to Creation of an National Information Infrastructure ($1.25M)

Research Groups

Design Lab, UC San Diego (2014–Present)

I am founding co-director (with Scott Klemmer and Don Norman) of the UC San Diego Design Lab. The lab's goal is to provide a research and educational foundation for understanding and designing complex socio-technical systems. Work in the lab addresses major societal issues, such as large-scale education, automation, healthcare, visualization of complex phenomena and data, social interactions, citizen science, and the ethical issues that are of ever-increasing importance. The lab will be moving into a new 74,000-square-foot Design & Innovation Building to be completed in 2021.

Distributed Cognition and Human Computer Interaction Research Group, UC San Diego (1997–2014)

I was founding co-director (with Ed Hutchins) of the Distributed Cognition and Human Computer Interaction Research Group. The lab was a leader in the shift in cognitive science toward a view of cognition as a property of systems that are larger than isolated individuals, extending the reach of cognition to encompass interactions between people as well as interactions with resources in the environment. The Dcog-HCI lab was dedicated to developing the theoretical

and methodological foundations engendered by this broader view of cognition and united in the belief that distributed cognition promises to be a particularly fertile framework for designing and evaluating augmented environments and digital artifacts. A central image is environments in which people pursue their activities in collaboration with the elements of of the social and material world. The core research efforts were directed at understanding such environments: what we really do in them, how we coordinated our activity in them, and what role technology should play in them.

Computer Graphics & Interactive Media Research Group, Bellcore (1989–1993)

I established the Computer Graphics and Interactive Media Research Group at Bellcore. Research focused on information visualization and construction of multiscale visualization and interface prototyping environments (Pad++). Projects included unified graphical interfaces to heterogeneous databases, visualization of network and switching activity, visualization of software systems and programmer activities, information filtering, prototyping and exploration of interactive animations, and empirical studies of history-enriched digital objects. Our Bellcore Video Recommender was one of the earliest demonstrations of the effectiveness of collaborative filtering. Additional efforts were concerned with theories of telecommunications and exploration of alternatives to imitating face-to-face interactions for supporting informal communication.

Human Interface Laboratory, MCC (1987–1989)

As Director of the Human Interface Laboratory (annual budget $5M) at MCC, I coordinated the efforts of 40 researchers. Areas of research were graphics, knowledge editing, natural language, neural networks, computer supported cooperative work, and new metaphors for interaction design. Our goal was to develop the foundations for principled and efficient construction of collaborative interfaces to high-functionality systems. Research within the laboratory was coordinated around the construction of an integrated interface prototyping environment and its application to challenging interface problems. The vision was to evolve a set of human interface tools (HITS) into a general user interface design environment (GUIDE). HITS and GUIDE were experimental vehicles for grounding, motivating, and coordinating the lab's scientific and technological efforts. They served as prototypes supporting the rapid implementation, exploration, and demonstration of new human interface concepts.

Intelligent Systems Group and Future Technologies Group, UCSD/NPRDC (1977–1987)

In my earlier work at UCSD, in collaboration with Ed Hutchins and Don Norman, I served as Director of the Intelligent Systems Group. Our research group was concerned with application of artificial intelligence and cognitive science to the design of human computer interfaces and development of graphical simulation-based training systems. At NPRDC I was head of the Future Technologies Group and in collaboration with Ed Hutchins and Michael Williams led efforts to build advanced training systems (Moboard, Semnet, and Steamer). I was PI on a number of research projects: Theory of Graphic Representation, Declarative and Procedural Representation, Steamer: An Advanced Intelligent Computer-Assisted Instruction System (in collaboration with Larry Stead, Bruce Roberts, and Al Stevens at BBN), Qualitative Interfaces to Quantitative Process Models, AI-Based Tools for Building Simulations, and Computation via Direct Manipulation.

Software Systems

A major portion of my intellectual activity is devoted to the design and implementation of software systems. Such systems are fundamental to my research. I find creating software and sharing it

with students and the wider research community to frequently have a more significant impact than traditional forms of academic publication. Software is an artifact that can mediate very productive interactions and collaborations. In addition to the software systems mentioned above (Steamer, Moboard, Semnet, and HITS) here I provide brief descriptions of recent software systems I have developed.

ChronoViz: Navigation, Visualization, and Analysis of Time-Based Data

ChronoViz is designed to facilitate annotation, navigation, and analysis of multiple streams of video and other time-coded data. ChronoViz is unique in being an open-source system that was specifically designed both to visualize multiple data streams simultaneously and to be easily extended. A Python plugin architecture enables incorporation of additional types of data as well as new analysis and visualization facilities. As an example of ChronoViz's extensibility, members of my lab recently extended ChronoViz to incorporate eye-movement data from pilots in a high-fidelity simulator along with multiple streams of video, field notes recorded with digital pens, and simulator data. This allows analysts to move between eye fixations on a specific instrument and the associated video segments in which they occurred or to touch a paper note annotation and have videos positioned at the time that note was taken. ChronoViz's plugin architecture facilitated inclusion not only of eye-movement data, computing fixation locations, and association of fixations with instruments, but also computing transition probabilities between instrument fixations.

Dynapad: Scheme-Based Zoomable Multiscale Visualization Software

Dynapad is the third generation of our multiscale interface and visualization software. The name Dynapad was chosen to reflect the software's heritage from our earlier Pad++ and STkPad software as well as ideas from Dynabook and Sketchpad. It makes scale a first-class parameter of objects, supports navigation in multiscale workspaces, and provides especially effective mechanisms to maintain interactivity while rendering large numbers of graphical objects. Dynapad employs Scheme to provide a high-level programming interface to the multiscale graphical and interaction facilities in the C++ rendering substrate.

Dynapad implements multiscale graphical objects that are interactive (e.g., they can be scaled or moved via user interaction) and dynamic (e.g., they can have behaviors that result from the running of attached code). Behaviors can be associated with an object, a set of objects, or a region of the multiscale workspace and are triggered by user actions, the behavior of other objects, various events, or timer interrupts. It is build using PLT Scheme. and was the basis for our exploration of informational physics and development of piles and lenses to support image-based access and organization of information.

STkPad: Scheme-Based Zoomable Multiscale Visualization Software

STkPad is a version of Pad++ developed at UCSD. It consists of 97,737 lines of code. It's main features are the replacement of the Tcl scripting language used in Pad++ with Scheme and integration of MySQL, a relational database. The database serves to store STkPad content and to provide a mechanism to support collaborative applications. The research focus for STkPad is to explore shared activity histories and image-based information navigation. I developed it in collaboration with two recent postdocs, David Fox and Ron Hightower.

Pad++: Zoomable Multiscale Visualization Software

I led the effort to develop Pad++. This software has made possible the first serious exploration of multiscale interfaces. It consists of 164,714 lines of code and was non-exclusively licensed to

Sony for $500,000. My main collaborator was Ben Bederson and much of the elegance of the software was due to Ben. The development of the software benefitted from interactions with Ken Perlin and Jon Myer at New York University, George Furnas at the University of Michigan, and feedback from a surprising number of the 4500 people who downloaded the code.

Presentations and Invited Addresses

I have given hundreds of talks and invited addresses over the years. A list is available on request.