

Patrick E. Carlson

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Education

PhD, Iowa State University, 2008 - 2015

Major: Human-Computer Interaction

Cumulative GPA: 3.68/4.0

Bachelor of Arts, *cum laude*, Simpson College, 2003 - 2008

Majors: Computer Science and Psychology

Cumulative GPA: 3.715/4.0

Industry Experience

Sandia National Labs – Albuquerque, New Mexico

Data Scientist, April, 2017 - Present

Data analysis, software development, data virtualization, Tableau visualization, and UX reviews.

Renaissance Learning – Wisconsin Rapids, Wisconsin

User Experience Analyst, February, 2016 - March, 2017

Perform remote usability testing on software prototypes, help with UI design, and develop and analyze survey data. Aggregate and analyze customer feedback data using Pandas and scikit-learn to automatically apply themes to text descriptions. Present theme results using Tableau.

Research Experience

Data Analytics – personal project

Kaggle.com competition, August - October, 2015

Used Pandas and scikit-learn to analyze hundreds of thousands of HTML files as part of the “Truly Native” Kaggle competition. The objective was to identify whether or not a webpage had native advertisements. Random Forest machine learning was used from the scikit-learn Python library.

Iowa State University – Ames, Iowa

Improving Open Source Software Development (Dissertation Topic), 2010 - 2015

Apply data mining in the development of algorithms and tools to improve developer understanding of technical and social structure in large Open Source communities. Under direction of Dr. Judy Vance.

Bimanual Haptics for Virtual Assembly Tasks (Research Assistant), 2009 - 2015

Designed and analyzed studies examining various bimanual haptic device configurations and learning transfer for virtual assembly tasks. Under direction of Dr. Judy Vance.

Mentor/Support Research Experience for Undergraduate (REU) Students, Summer 2010

Helped coordinate three undergraduate REU students whose project entailed creating a physical mockup of a shopping cart which was then used in a virtual reality user study. Under direction of Dr. Judy Vance.

University of New Mexico – Albuquerque, New Mexico

Research Experience for Undergraduates (REU), Spring 2006 - Fall 2007

Learned the basics of machine learning and worked on applying this to improving the routing of packets in a dynamic network. Under direction of Dr. Terran Lane.

Simpson College – Indianola, Iowa

Usability and Appeal of the Linux Desktop (Psychology Capstone), Spring 2007 - Fall 2008

Constructed and performed an experiment empirically contrasting usability and appeal of a 2D versus 3D Linux desktop.

Origins of Human Cooperation and Altruism, Fall 2005 - Fall 2006

Simulated the evolution of cooperation/altruism using game theory techniques and genetic algorithms. Presented work at Argonne National Laboratory.

Teaching Assistantships

Iowa State University – Ames, Iowa

ME/WLC 484/584: Technology, Globalization, and Culture, Fall 2013

Graded homework, facilitated online class discussions

HCI/Psych 522: Scientific Methods in HCI, Spring 2013

Graded homework and managed content for online website

CS 309: Software Development Practices, Spring 2009

Graded homework, helped students with documenting project development

CS 207: Programming I, Fall 2008

Assisted and tutored students with homework and basic programming concepts

Work Experience

Iowa State University – Ames, Iowa

Engineering/LAS Online Learning (Graduate Assistant), Fall 2014

Recorded class videos, advised undergraduate producers, and scripted automated startups for recordings

Simpson College – Indianola, Iowa

Student Technician, Nov 2005 - May 2006

Helped students and faculty connect to the Internet and troubleshoot network issues

Mounds Park Academy – St. Paul, Minnesota

Computer Technician, Summer 2002 - 2005, 2008

Conducted laptop repair and software setup for 60 freshman students. Imaged and configured multiple computer labs

Published Research

Peer-Reviewed Journal Articles

1. Patrick Carlson, Judy M. Vance, and Meisha Berg. An evaluation of asymmetric interfaces for bimanual virtual assembly with haptics. *Virtual Reality*, pages 1–9, 2016
2. Patrick Carlson, Anicia Peters, Stephen Gilbert, Judy M. Vance, and Andy Luse. Virtual Training: Learning Transfer of Assembly Tasks. *IEEE Transactions on Visualization and Computer Graphics*, 21(6):770–782, 2015

Conference Papers

1. Mike Oren, Patrick Carlson, Stephen Gilbert, and Judy M. Vance. Puzzle Assembly Training: Real World vs. Virtual Environment. In *Proceedings of the IEEE 2012 Virtual Reality Conference*, pages 1–4, Orange County, California, 2012. IEEE
2. Judy M. Vance, Stephen B. Gilbert, Michael Oren, Ryan Pavlik, and Patrick Carlson. GOALI: A Hybrid Method to Support Natural Interaction of Parts in a Virtual Environment. In *NSF Engineering Research and Innovation Conference Proceedings*, pages 1–4, Atlanta, Georgia, 2011
3. Patrick Carlson, Carl Kirpes, Ryan A. Pavlik, Judy M. Vance, Livien Yin, Terrence Scott-Cooper, and Troy Lambert. Comparison of Single-Wall Versus Multi-Wall Immersive Environments to Support a Virtual Shopping Experience. In *Proceedings of the ASME 2011 World Conference on Innovative Virtual Reality (WINVR2011)*, pages 1–5, Milan, Italy, 2011a. ASME

Workshop Papers

1. Patrick Carlson and Nan Xiao. Experience and Recommendations for Distributed Software Development. In *Proceedings of the International Conference on Software Engineering (ICSE) Workshop on Collaborative Teaching of Globally Distributed Software Development*, pages 1–4, Zurich, Switzerland, 2012. ACM

Poster Presentations

Patrick Carlson and Judy M. Vance. Who Should I Contact?: Helping New Developers Find Experts, 2013. Poster presented at the Emerging Technologies Conference, April 2013, Ames IA ***Awarded most interesting research project***

Stephen Vance, Judy M. Gilbert, Michael Oren, Ryan Pavlik, and Patrick Carlson. GOALI: A Hybrid Method to Support Natural Interaction of Parts in a Virtual Environment, 2012. Poster presented at the NSF Engineering Research and Innovation Conference, July 2012, Atlanta Georgia

Anicia Peters, Patrick Carlson, Stephen Gilbert, and Judy M. Vance. A Hybrid Method to Support Natural Interaction of Parts in a Virtual Environment, 2012. Poster presented at the Emerging Technologies Conference, April 2012, Ames, IA ***Awarded most interesting research project***

Patrick Carlson, Judy M. Vance, Tien Nguyen, and Kevin Blankenship. Social Technical Congruence: The Link Between Social Science and Technology, 2011b. Poster presented at the Emerging Technologies Conference, April 2011, Ames, IA

Patrick Carlson and Judy M. Vance. An Evaluation of Asymmetric Interfaces for Bimanual Virtual Assembly With Haptics, 2010. Poster presented at the ASME World Conference on Innovative Virtual Reality, May 2010, Ames, IA

Patrick Carlson. Usability and Appeal of a 2D versus 3D Linux Operating System, 2008. Poster presented at the Midwestern Psychological Association, May 2008, Chicago, IL

Invited Presentations

IEEE VR 2015 (presented by Dr. Judy Vance), invited by Dr. Ed Swan, talk title: “Virtual Training: Learning Transfer of Assembly Tasks”, March 23-27, 2015

IE 681 Cognitive Engineering, invited by Dr. Stephen Gilbert, talk on Open Source communities, December 4, 2014

HCI 591 Seminar, talk on Open Source socialization, November 16, 2012

Outreach

Road Less Traveled, Spring 2010, 2011, 2012, 2013

Demo of virtual reality system for over 50 middle school and high school girls from across Iowa.

ISU Badminton Club online tournament support, 2010, 2011, 2012, 2014, 2015

Created online tournament registration and administration system

Professional Organizations

Special Interest Group on Human-Computer Interaction (Student Member)

Association for Computing Machinery (Student Member)

Groups and Activities

Iowa State University Badminton Club, 2009 - 2015

ISU Badminton Club Webmaster, 2009 - 2012

Computational Design Synthesis: Summer Camp (Munich, Germany), August 1-5, 2011

ISU Human-Computer Interaction Student Group Vice President, 2010 - 2011

Simpson College Math Club, 2006 - 2008

Simpson College Computer Club, 2003 - 2008

Honors

Iowa State University Research Excellence Award, Spring 2015

Outstanding Senior in Computer Science (Simpson College), May 2008

Honorable Mention in the Mathematical Contest in Modeling (MCM), 2006, 2007, 2008

Floyd S. Doft Memorial Scholarship (Simpson College), 2007 - 2008

Psi Chi National Honor Society in Psychology, March 2007

Simpson College Dean's List, Spring 2005, Fall 2006, Fall 2007

Simpson College Academic Honor Scholarship, Fall 2003 - Spring 2008

Certificate of Achievement from MPA Technology Department, December 2000

Technical Skills

Programming Languages: Python, Lua, Java, R, C++, C#, HTML, Javascript, PHP, MySQL, LaTeX, Cypher (Neo4j)

Tools: Windows, Linux, Git, Subversion, CMake, Eclipse, LAMP stack, Tableau, Jupyter

Libraries: Pandas, SciPy, scikit-learn, jQuery, D3.js, Django, Bootstrap

Last updated: April 30, 2017