

Richard T. Skarbez

216 Finley Forest Dr.
Chapel Hill NC 27517

USA

☎ +1 (814) 883 7760

✉ skarbez@gmail.com

🌐 rickskarbez.github.io

linkedin in rickskarbez

✉ rskarbez



Education

August 2016 **Ph.D in Computer Science**, *The University of North Carolina at Chapel Hill*, Chapel Hill, NC, USA.

Dissertation Title: *Plausibility illusion in virtual environments*

Advised by Mary C. Whitton and Frederick P. Brooks, Jr.

May 2010 **M.S. in Computer Science**, *The University of North Carolina at Chapel Hill*, Chapel Hill, NC, USA.

December 2004 **B.S. with Honors in Computer Engineering**, *Pennsylvania State University—University Park*, University Park, PA, USA.

Thesis Title: A presentation of the semantics and formal properties of C3L, an event-driven distributed control language

Dissertation

title *Plausibility illusion in virtual environments*

supervisors Mary C. Whitton and Frederick P. Brooks, Jr.

description Recently, Professor Mel Slater proposed that in addition to *presence*, the feeling of “being there” in a virtual environment, researchers also need to consider the feeling that the events depicted in the VE appear real. He coined the terms *Place Illusion* (PI) and *Plausibility Illusion* (Psi), respectively, to refer to these subjective feelings. I investigated Psi over the course of several experiments, demonstrating that Psi can be detected using existing presence measures including questionnaires and physiological metrics, that inconsistent behavior of virtual objects causes increased heart rate in participants, that Psi is affected by individual differences (as is presence), and that it is feasible to determine a rank ordering of VE factors that affect Psi in VEs, with the presence of the virtual body being most important of those factors tested.

Experience

Research and Development

- 2016– Present **Systems Programmer**, *iRODS Consortium*, Chapel Hill, NC, USA.
- Implemented the iRODS Python rule engine plugin
 - Carried out performance evaluation on the iRODS 4.2 release
 - Redesigned and re-implemented iRODS code to improve performance
 - Wrote blog posts and other supporting documentation
- 2014–2016 **Graduate Student Researcher**, *National Consortium for Data Science*, Chapel Hill, NC, USA.
- Designed and implemented metadata template functionality for iRODS in Java
 - Installed, configured, and maintained NCDS iRODS and Dataverse installations
 - Wrote, revised, and helped prepare materials for NSF site review
 - Curated a variety of large datasets
- 2011 **Graduate Research Assistant**, *Avatar project*—UNC Department of Computer Science, Chapel Hill, NC, USA.
- Designed experiments to evaluate the effectiveness of novel display technologies
 - Wrote documents for and interacted with UNC's Institutional Review Board
 - Conducted experiments and interviews with experimental participants
 - Processed and analyzed experimental data using Python, MATLAB, and SPSS
- 2008–2009 **Graduate Research Assistant**, *NC-FIRST*, Chapel Hill, NC, USA.
- Developed a mobile web interface for the NC-FIRST weather site
 - Contributed to several proposals regarding the use of sensor networks and mobile computing devices in emergency response applications
- 2008 **SDET Intern**, *Microsoft Corporation*, Redmond, WA, USA.
- Designed and implemented in Python a framework for automating multi-computer test scripts for the Mac Messenger test team
 - Wrote test plans for new Messenger features
- 2005–2007 **Graduate Research Assistant**, *Wide Area Visuals project*—UNC Department of Computer Science, Chapel Hill, NC, USA.
- Developed software in C++ and MATLAB for calibration of projector-camera systems
 - Contributed to posters and papers published by the WAV research group
- 2004–2005 **Student Researcher**, *Applied Research Laboratory*, University Park, PA, USA.
- Wrote the semantics for the Command, Control, and Communications Language (C3L) developed at the ARL
 - Developed components of the C3L interpreter, including a pathology checker
- 2002 **Intern—End-of-line processing**, *IBM Corporation*, Endicott, NY, USA.
- Developed a procedure for automatic generation of drill machine programs from test data identifying circuit panel defects
 - Performed panel testing and drill machine programming
- 2001 **Intern—Digital Video Products Group**, *IBM Corporation*, Endicott, NY, USA.
- Implemented a relational database to store test procedures and results
 - Performed hardware and software validation testing

Teaching

- 2012–2014 **Instructor—Sketch writing**, *DSI Comedy Theater*, Chapel Hill, NC, USA.
- Helped revise sketch writing curriculum
 - Selected examples to drive in-class discussion
 - Reviewed, led discussion of, and suggested revisions for student writing assignments
- 2010 **Graduate Teaching Assistant—COMP 116 (Introduction to Scientific Programming)**, *UNC Department of Computer Science*, Chapel Hill, NC, USA.
- Acted as lead TA for the course
 - Lectured weekly in recitation sections
 - Assisted students during office hours
 - Coordinated work among myself and other TAs
 - Graded programming assignments and exams
- 2009 **Graduate Teaching Assistant—COMP 110 (Introduction to Programming—Java) and COMP 401 (Foundations of Programming)**, *UNC Department of Computer Science*, Chapel Hill, NC, USA.
- Acted as lead TA for the courses
 - Led recitation sections
 - Wrote exams, assignments, and lecture materials
 - Assisted students during office hours
 - Coordinated work among myself and other TAs
 - Graded programming assignments, written assignments, and exams
- 2008 **Instructor—COMP 575 (Computer Graphics)**, *UNC Department of Computer Science*, Chapel Hill, NC, USA.
- Acted as sole instructor for the course
 - Developed a new syllabus for the course
 - Wrote all assignments, exams, and lecture materials
 - Graded all course materials
- 2006 **Graduate Teaching Assistant—COMP 872 (Introduction to Virtual Worlds)**, *UNC Department of Computer Science*, Chapel Hill, NC, USA.
- Helped plan scheduling, assignments, and lecture topics
 - Familiarized students with the hardware and software they would use for course projects
 - Provided technical help for students

Publications

Richard Skarbez, Frederick P. Brooks, Jr., and Mary C. Whitton. (2016). *A survey of presence in virtual environments and related topics*. (Submitted for initial review.)

Richard Skarbez, Frederick P. Brooks, Jr., and Mary C. Whitton. (2016). *Immersion and coherence in a visual cliff environment*. IEEE Virtual Reality conference. (Accepted as a poster.)

Richard Skarbez, Solène Neyret, Frederick P. Brooks, Jr., Mel Slater, and Mary C. Whitton. (2016). *A psychophysical experiment regarding the components of plausibility illusion*. IEEE Transactions on Visualization and Computer Graphics (TVCG). (Accepted pending minor revisions.)

Richard Skarbez. (2016). *Plausibility illusion in virtual environments*. Doctoral dissertation. The University of North Carolina at Chapel Hill.

Richard Skarbez, Aaron Kotranza, Frederick P. Brooks, Jr., Benjamin Lok, and Mary C. Whitton. (2010). *An initial exploration of conversational errors as a novel method for evaluating virtual human experiences*. Poster. IEEE Virtual Reality 2010, Singapore.

Richard Skarbez and Mary C. Whitton. (2009). *Enabling distributed collaboration among heterogeneous devices*. Presentation. ACM CHI 2009 Workshop on the Changing Face of Digital Science, Boston, MA, USA.

Tyler Johnson, Florian Gyrafas, **Richard Skarbez**, Herman Towles, and Henry Fuchs. (2007). *A personal surround environment: projective display with correction for display surface geometry and extreme lens distortion*. IEEE Virtual Reality 2007, Charlotte, NC, USA.

Tyler Johnson, Florian Gyrafas, **Richard Skarbez**, Patrick Quirk, Herman Towles, and Henry Fuchs. (2006). *Multi-projector image correction on the GPU*. Poster. Workshop on Edge Computing, Chapel Hill, NC, USA.

Patrick Quirk, Tyler Johnson, **Richard Skarbez**, Herman Towles, Florian Gyrafas, and Henry Fuchs. (2006). *RANSAC-assisted display model reconstruction for projective display*. IEEE Virtual Reality 2006 Workshop on Emerging Display Technologies, Alexandria, VA, USA.

Mendel Schmiedekamp, **Richard Skarbez**, and Shashi Phoha. (2006). *Formal methods for verification and validation of distributed interacting devices*. 10th Annual IASTED International Conference on Software Engineering Applications, Dallas, TX, USA

Richard Skarbez. (2004). *A presentation of the semantics and formal properties of C3L, an event-driven distributed control language*. Honors thesis. The Pennsylvania State University

Activities and Honors

Professional associations

- Association for Computing Machinery (ACM)
- Institute of Electrical and Electronics Engineers (IEEE) Computing Society

Reviewing experience

- IEEE Virtual Reality conference

Student activities

- Team leader, UNC Effective Virtual Environments (EVE) research group, 2011–2015
- President, UNC Computer Science Student Association, 2007–2008
- Coordinator, UNC Computer Science Graphics Lunch, 2005–2009
- President/Editor-in-chief, PHROTH (Penn State's Humor Magazine), 2003–2004
- Penn State Debate Team
- HKN Electrical and Computer Engineering Honors Society
- Golden Key National Honors Society

Technical

Programming Languages

- C
- Java
- Python
- C++
- C Sharp
- MATLAB

Statistics and analysis

- SPSS
- SAS

Game engines

- Gamebryo
- Unity

Other

- LaTeX
- Qualtrics

References

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| Dr. Frederick P. Brooks, Jr. | <i>Kenan Professor Emeritus, Department of Computer Science, University of North Carolina at Chapel Hill</i> |
| Mary C. Whitton | <i>Research Professor, Department of Computer Science, University of North Carolina at Chapel Hill</i> |
| Dr. Mel Slater | <i>ICREA Research Professor, Universitat de Barcelona</i> |
| Dr. Stanley Ahalt | <i>Director, Renaissance Computing Institute (RENCI)</i> |