Carol E. Reiley

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Department of Computer Science
Johns Hopkins University, Baltimore, MD 21218
US Citizen

RESEARCH INTERESTS

Computer Vision, Robot-Assistive Technology, and Teleoperated Systems

EDUCATION

2006-present Johns Hopkins University Baltimore, MD
- Ph.D. in Computer Science (Expected June 2010)
- Advisor: Dr. Gregory Hager

2004-2007 Johns Hopkins University Baltimore, MD
- M.S. in Computer Science
- Advisor: Dr. Allison Okamura
- Thesis Title: System Design and Implementation of Visual Force Feedback and Virtual Fixtures in Robot-Assisted Surgical Systems: Evaluating Alternatives to Direct Force Feedback Using Augmented Reality, April 2007

2000-2004 Santa Clara University Santa Clara, CA
- B.S. in Computer Engineering
- Advisors: Dr. Christopher Kitts and Dr. Neil Quinn
- Thesis Title: Haptic Integration of IBM Manipulator, May 2004

RESEARCH EXPERIENCE

January 2007-present Johns Hopkins University Baltimore, MD
Research Assistant, *Robotic Gesture Recognition*
- Researching the language of motion and creating a vocabulary of gestures using computer vision.
- Advisor: Dr. Gregory Hager

September 2004-2006 Johns Hopkins University Baltimore, MD
Research Assistant, *Evaluation of Augmented Reality Alternatives to Direct Force Feedback in Robot-Assisted Surgery: Visual Force Feedback and Virtual Fixtures*
- Researching the impact on surgeon performance when forces at the instrument tips are displayed through an augmented reality display using the da Vinci surgical system in situations when haptics is not available. Advisor: Dr. Allison Okamura

Summer 2003 University of Delaware Newark, DE
Intern, *Program Slicing for OpenMP Shared Memory Parallel Programs*
- Designed and implemented a user-friendly web interface for existing program slicer for parallel programs.
- Assisted in a research framework for the mining of Aspects (Aspect Oriented Programming). Advisor: Dr. Lori Pollock

August 2001 - June 2003 Santa Clara University Santa Clara, CA
Research Assistant, *Low Cost Underwater Robotics Design*
- Lead programmer and team leader of an interdisciplinary team of five engineers to develop a shallow underwater vehicle. Programmed in C so ROV had the ability to be controlled through the Internet, relays, or Rabbit Zworld Microcontroller. Advisor: Dr. Christopher Kitts

WORK EXPERIENCE

June 2007 - August 2007 General Electric Research Niskayuna, NY
Intern, *Spatial-Temporal Classification for People Localization*. Advisor: Peter Tu, Gianfranco Doretto, and Fred Wheeler

May 2004 - August 2004 Lockheed Martin Space Corporation Sunnyvale, CA
Software Engineer, *Space Based Infrared Systems/Mobile User Objective System*

- Worked with architecture and development teams to support software requirements for Space Based Infrared Systems (SBIRS) program. Advisor: Christopher Chun
- Member of team that wrote winning proposal for multi-billion dollar contract (Mobile User Objective System). Advisor: Joe Damore and John Thacker

January 2004 - May 2004 Lockheed Martin Space Corporation Sunnyvale, CA
Intern, *Central Design Engineering*

- Worked in central design engineering writing/maintaining scripts and search engine. Advisor: Nik Djordjevic

September 2001 – December 2003 Santa Clara University IT Santa Clara, CA
Help Desk Administrator/Lab Technical Assistant

- Provide hardware and software service to 200+ students daily. Advisor:
- Deal with sensitive customer service.
- Ensure machines in lab maintain peak performance.

September 1999 - June 2000 Evergreen School District Vancouver, WA
TV Math and English tutor

- Live local cable television show, called Homework Helpline, where students K-12 call in to ask help on homework. Airs three nights a week.

TEACHING EXPERIENCE (Taught or Co-Taught)

Haptic Applications in Medical Robotics (new course), Johns Hopkins University, Intersession 2007. An overview of cutting edge medical robotic technology and exploring the role of haptic (tactile and force) feedback in a surgical setting. Course work includes weekly lectures, hands-on laboratory exercises in addition to paper readings, discussions, and presentations. Co-taught with Ms. Panadda Marayong

JOURNAL PUBLICATIONS

- **C. E. Reiley**, T. Akinbiyi, D. Burschka, A. M. Okamura, C. Hasser, D. Yuh, "Visual Force Feedback in Laparoscopic Minimally Invasive Surgery." In Preparation for IEEE Transactions Biomedical Engineering.
- **C. E. Reiley**, T. Akinbiyi, D. Burschka, A. M. Okamura, C. Hasser, D. Yuh, "Evaluation of Surgical Tasks using Sensory Substitution in Robot-Assisted Surgical Systems." The Journal of Thoracic and Cardiovascular Surgery. (accepted)

CONFERENCE PUBLICATIONS

- **C.E. Reiley**, H.C. Lin, B. Varadarajan, S. Khudanpur, D. D. Yuh, and G. D. Hager, " Automatic Recognition of Surgical Motions Using Statistical Modeling for Capturing Variability", MMVR 2008.
- A.M. Okamura, M. Mahvash, L.N. Verner, **C.E. Reiley**, "Haptics for Robot-Assisted Surgery", International Symposium of Robotics Research, 2007 (submitted).
- B. Vagvolgyi, **C. E. Reiley**, G. D. Hager, A. W. Levinson, L. Su, "Toward Direct Registration of Video to Computed Tomography for Intraoperative Surgical Planning during Laparoscopic Partial Nephrectomy", World Congress of Endourology, 2007.
- T. Akinbiyi**, C. E. Reiley**, S. Saha, D. Burschka, C. J. Hasser, D. D. Yuh, and A. M. Okamura. "Dynamic Augmented Reality for Sensory Substitution in Robot-Assisted Surgical Systems," 28th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 2006, pp. 567-570.

POSTER PRESENTATIONS

- T.Gao, J. Ji, **C.E. Reiley**, B. Winters, L. Selavo, N. Whyms. "Advancing MET Through Intelligent Patient Monitoring" 3rd Annual Medical Emergency Team/Rapid Response Team Conference, 2007.
- **C. E. Reiley** and A. M. Okamura. "Augmented Reality for Haptic Display in Robot-Assisted Surgical Systems", SWE, Kansas City, MO: October 2006.
- **C. E. Reiley.** "Dynamic Augmented Reality for Haptic Display in Robot-Assisted Surgical Systems", CRA-W DMP Reunion at the 2004 Grace Hopper Conference, Chicago, IL: October 2004.
- **C. E. Reiley**. "Program Slicing for OpenMP Shared Memory Parallel Programs", University of Delaware Undergraduate Summer Research Symposium, August 2003.
- **C. E. Reiley**, "Robotics System Lab", Santa Clara University Capital Campaign to Portland, Oregon, May 2004.

INVITED PRESENTATIONS

- **C. Reiley**, Seminar, "Visual Force Feedback and Virtual Fixtures In Robot-Assisted Surgical Systems." Oregon Health and Science University OGI School of Engineering and Science , Beaverton, OR. August 21, 2007.
- **C. Reiley**, Graduate Engineering Seminar, "Dynamic Augmented Reality in Robot-Assisted Surgical Systems." Santa Clara University, Santa Clara, CA. May 26, 2005.

TECHNICAL QUALIFICATIONS

- **Programming Languages**: Perl, C/C++, Java, ML, Haskell, Fortran, Shell Programming, Latex, HTML, OpenGL
- **Software**: Microsoft Office, Adobe Photoshop, Rhapsody, Eclipse, OpenCV
- **Operating Systems**: Windows, Mac OS, Solaris, Linux
- **Courses**: Computer Integrated Surgery; Motors, Sensors, and Actuators; Computer Vision; Intro to Robotics; Programming Languages; Randomized Algorithms; Surgery for Engineers; Databases, Haptics and Teleoperated Systems (audit), Medical Imaging Analysis (audit), Machine Learning (audit).

AWARDS & HONORS

- **National Science Foundation Graduate Research Fellowship,** 2006-2009.
- **Clare Booth Luce Scholarship,** 2007-2008.
- **JHU Alumni Association Community Action Grant,** 2006-2007.
- **National Society of Women Engineers (SWE) Collegiate Poster Competition Finalist:** Ten finalists selected to go to national convention to compete for top three, 2006.
- **Society of Women Engineers (SWE) Baltimore/Washington Scholarship**, 2006.
- **Raymond M. Galantine Award**: Recognizes an outstanding engineering student who has demonstrated a commitment to putting into practice the Catholic and Jesuit ideal of people in the service of others, 2004.
- **James F. Lincoln Arc Welding Foundation**, Div IV Silver Award, 2004.
- **Best of Session**, Santa Clara University Interdisciplinary Engineering Session for Senior Capstone: Haptic Integration (force feedback) of an IBM manipulator, 2004.
- **Faculty Recognition for Technical Excellence:** awarded to 8 seniors from the class of 2004 at Santa Clara University for completing a capstone design project that is distinguished by an exceptionally high degree of technical and scholarly achievement, 2004.
- **National Society of Women Engineers (SWE) Scholarship**, 2004.
- **Silicon Valley Engineering Council Engineering Education Scholarship**: recognition of engineering students for their dedication, focus, and commitment to engineering, 2004.

- **Dean's Fund**: Wrote proposal to win grant for senior design project, 2004.
- **Student Leadership Fund**: Grant to fund senior design project, 2004.
- **Dean's Scholar**, The top accepted freshmen in each academic division. 2000-2004.
- **Bannan Merit Scholarship**, This scholarship is awarded to a limited number of students who have demonstrated high academic achievement and exemplify the best traditions of Santa Clara University in terms of leadership, integrity, and community service, 2000-2004.
- **Santa Clara University external scholarships**, 2000-2004.
- **Chinese American Citizens Alliance Fred G. Lee Memorial Scholarship**, 2000.
- **SouthWest Medical Hospital Junior Volunteer Health Auxiliary Scholarship**, volunteered over 500+ hours, 2000.
- **Admitted With Distinction,** Santa Clara University, 2000.

TRAVEL AWARDS

- Travel Award & Conference Attendee, 2004 Grace Hopper Conference, October 2004.
- American Association of University Women (AAUW) Conference for College Women Student Leadership Attendance Scholarship, 2003

PROFESSIONAL ACTIVITIES

- Collegiate Organizations: Active member of Women of Whiting Engineering, Computer Integrated Surgery Student Research Society
- National Organizations: ACM, IEEE, AAAI, SWE, AAUW, MentorNet

LEADERSHIP ACTIVITES

- **Board Member**, JHU Whiting School of Engineering Diversity Council, 2006-present.
- **President**, JHU Computer Integrated Surgery Student Research Society and National Engineering Research Center Student Leadership Council, 2005-present.
- **Treasurer**, JHU Women of Whiting Graduate Women's Group, 2005-2006.
- **Webmaster**, Haptics Exploration Lab, 2005-2006.
- **Treasurer**, JHU Computer Integrated Surgery Student Research Society, 2004-2005.
- **Demo Coordinator**, the Haptics Exploration Lab, 2004-2005.
- **Co-Chair**, SCU Engineering Executive Council, 2003-2004.
- **Vice President**, SCU Society of Women Engineers, 2003-2004.
- **Founder and President,** SCU Association of Computing Machinery, 2002-2004.
- **Head Neighborhood leader,** SCU Community Council, 2002-2003.
- **Santa Clara University Ambassador,** 2002-2003.
- **Host,** Intervarsity Bronco Christian Fellowship, 2001-2002.
- **Publicity Coordinator,** SCU Community Council, 2001-2002.

MENTORING EXPERIENCE

- Rebecca Ringle. Women in Science and Engineering (WISE) Mentor to a Garrison Forest High School Student, Spring 2006. (*will be attending Swathmore College*)

INVITED OUTREACH PRESENTATIONS

- Three hour college workshop, Mountain View High School, Vancouver, WA. October 3, 2006.
- WISE college panel for Garrison Forest High School girls, Baltimore, MD. October 19, 2006.
- Institution of Electrical and Electronic Engineers, Santa Clara University Student Chapter, Santa Clara, CA. June 2004.
- Society of Women Engineers, Santa Clara University Student Chapter, Santa Clara, CA. May 2004.

- College Panel, Wilcox High School, Santa Clara, CA. February 2004.

TECHNICAL OUTREACH

- Robotics Challenge, March 31st, 2007 (http://lacuna.cs.jhu.edu/RoboticSystemChallange2007)
- Robotics Challenge, April 1st, 2006 (http://lacuna.cs.jhu.edu/RoboticSystemChallange2006)
- Computer Mania Day, April 9, 2005 (http://www.computer-mania.info/)
- Surgical Lego Competition, Feb. 4, 2005 (http://www.cisst.org/students/lego2005/)
- HeadsUP What Is Engineering? Fair, January 27, 2005 (http://headsup.jhu.edu/what-is-engineering)
- SWE/ACM Industry Night (Won Golden Gate SWE Regional 1nd place for event).
- SWE Carnival: Showcased senior design project and robotics to 40 elementary school students.
- Spearheaded STARS event: 60 middle school students learn about Autocad, Underwater Robotics, and basic science experiments. (Won Golden Gate SWE Regional 2nd place for event).
- BotBall Competition, November 13, 2003 (http://www.nasa.gov/centers/ames/news/releases/2003/03images/botball/botball.html)

TECHNICAL REVIEWS

- Robotica Manuscript 2006
- Medical Image Computing and Computer-Assisted Intervention (MICCAI) 2006
- Euro Haptics Conference 2005

PERSONAL DATA

- Date of Birth: August 30th, 1982
- Place of Birth: Flint, MI, USA
- Languages: English and Mandarin
- Contact Information:

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