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U.S. Citizen

Curriculum Vitae
as of 11/04/2009

EDUCATION

University of South Florida

Department of Computer Science and Engineering

August 2004 – August 2009

Degree Conferred: August 7, 2009

Ph.D. Computer Science and Engineering

Computing Innovation Postdoctoral Fellowship

NSF Graduate Research Fellow

IEEE Robotics and Automation Society Graduate Fellow

Co-Advisors: Robin R. Murphy, Ph.D. and Lawrence O. Hall, Ph.D.

Dissertation: Robots without Faces: Non-Verbal Social Human-Robot Interaction

Major emphasis: Human-Robot Interaction, Affective Computing, Robotics, Artificial Intelligence

Minor emphasis: Psychology, Mathematics/Applied Statistics

University of South Florida

Department of Computer Science and Engineering

August 2001 to May 2004

B.S. Computer Science – Summa cum Laude - 4.0 GPA

Honors Thesis Advisors: Dmitry Goldgof, Ph.D. and Lawrence O. Hall, Ph.D.

Honors Thesis: Mining for Implications in Medical Data

Edison Community College

August 2000 to August 2001

Associate in Arts with High Honors – 4.0 GPA

Columbus State Community College

June 1987 to June 1989 and September 1998 to June 2000

Worked towards completing Basic Education Requirements

4.0 GPA while working full-time

PUBLICATIONS

Refereed Journal Articles

Bethel, C. L. and Murphy, R. R., “Review of Human Studies Methods in HRI and Recommendations,” in International Journal of Social Robotics, Under Review, November 2009.

Bethel, C. L. and Murphy, R. R., "Non-facial/Non-verbal Affective Expressions for Appearance-Constrained Robots," in *IEEE Transactions on Systems, Man, and Cybernetics, Part C – Applications and Reviews*, Volume 38, No. 1. January, 2008.

Dick, S., Bethel, C., and Kandel, A., "Software Reliability Modeling: The Case for Deterministic Behavior," *IEEE Transactions on Systems, Man and Cybernetics, Part A – Systems and Humans*, Volume 37, Issue 1, Pages 106-119. January 2007.

Refereed Conference Papers/Videos Proceedings and Presentations

Bethel, C. L., Bringes, C., and Murphy, R. R., "Non-Facial and Non-Verbal Affective Expression in Appearance-Constrained Robots for Use in Victim Management: Robots to the Rescue!" best video finalist in *4th ACM/IEEE International Conference on Human-Robot Interaction 2009*, San Diego, CA, March, 2009.

Day, B., Bethel, C. L., Burke, J. L., and Murphy, R. R., "A Depth Sensing Display for Bomb Disposal Robots," in *IEEE International Workshop on Safety, Security, and Rescue Robotics (SSRR 2008)*. Sendai, Japan, October, 2008.

Bethel, C. L., Salomon, K., Murphy, R. R., and Burke, J. L., "Survey of Psychophysiology Measurements Applied to Human-Robot Interaction," in *16th IEEE International Symposium on Robot & Human Interactive Communication*, Jeju Island, South Korea, August, 2007.

Bethel, C. L., Salomon, K., Burke, J. L., and Murphy, R. R., "Psychophysiological Experimental Design for Use in Human-Robot Interaction Studies," in *The 2007 International Symposium on Collaborative Technologies and Systems (CTS 2007)*, Orlando, FL, May, 2007.

Bethel, C. L. and Murphy, R. R., "Non-Facial/Non-Verbal Methods of Affective Expression as Applied to Robot-Assisted Victim Assessment," in *2nd ACM SIGCHI/SIGART Conference on Human-Robot Interaction (HRI2007)*, Washington, DC. March 2007.

Bethel, C. L., Hall, L. O., and Goldgof, D., "Mining for Implications in Medical Data," presented at *18th International Conference on Pattern Recognition (ICPR2006)*, Hong Kong. August, 2006.

Dick., S., Bethel, C., and Kandel, A., "Are Software Failures Chaotic?" in *2002 Annual Meeting of the North American Fuzzy Information Processing Society Proceedings, NAFIPS*. June, 2002.

Refereed Workshops/Symposia/Extended Abstracts

Bethel, C. L. and Murphy, R. R., "Use of Large Sample Sizes and Multiple Evaluation Methods in Human-Robot Interaction Experimentation," in *AAAI Spring 2009 Symposium: Experiment Design for Real-World Systems*. Stanford University, Palo Alto, CA, March, 2009.

Bethel, C. L., Bringes, C., and Murphy, R. R., "HRI'09 Video Abstract/Non-Facial and Non-Verbal Affective Expression in Appearance-Constrained Robots for Use in Victim Management: Robots to the Rescue!" abstract in *4th ACM/IEEE International Conference on Human-Robot Interaction 2009*, San Diego, CA, March, 2009.

Bethel, C. L., Salomon, K., and Murphy, R. R., "Preliminary Results: Humans Find Emotive Non-Anthropomorphic Robots More Calming," extended abstract in *4th ACM/IEEE International Conference on Human-Robot Interaction 2009*, San Diego, CA, March, 2009.

Bethel, C. L. and Murphy, R. R., "Non-Verbal Affective Expression for Use in Robotic Systems," presented at AAAI 2006 Fall Symposia on Aurally Informed Performance: Integrating Machine Listening and Auditory Presentation in Robotic Systems. Washington, DC. October, 2006.

Bethel, C. L. and Murphy, R. R., "Affective Expression in Appearance-Constrained Robots," presented at 1st ACM SIGCHI/SIGART Conference on Human-Robot Interaction (HRI2006), Salt Lake City, UT, 2006.

FUNDED INVITATIONAL WORKSHOPS and COHORTS

May 19, 2008 – Pasadena, CA

NEWHRI: Unifying characteristics of research in human-robot interaction workshop in conjunction with the ICRA'08 Conference - This workshop will bring together established and student researchers from HRI and the greater robotics community to answer three primary questions:

1. *What characteristics unify and should be common to all areas of HRI research?*
2. *What properties typify novel and significant research in HRI?*
3. *How can we further synergistic research between HRI and the broader robotics community?*

Invited and student researchers from different HRI-related areas will share their perspectives on these questions in paired talk format. Breakout discussion sections rising from these presentations will involve all attendees in an ongoing discussion to foster cross fertilization among subareas of HRI. Awarded full travel funding to participate in this workshop - \$835. <http://newhri.org/Home.html>

March 12, 2008 – Amsterdam, Netherlands

NSF HRI Pioneers Workshop 2008 - The field of human-robot interaction is new but growing rapidly. While there are now several established researchers in the field, many of the current human-robotic interaction practitioners are students or recently graduated. This workshop, held in conjunction with the HRI 2008 conference, aims to bring together this group of researchers to discuss their work, talk about the important upcoming issues in the field, and hear about what their colleagues are doing. Awarded full travel funding to participate in this workshop - \$1000. <http://www.hripioneers.org/hri08/>

June 9-10, 2007 – San Diego, CA

CRA-W Career Mentoring Workshop - The goal of the CRA-W Workshop on Research Career Mentoring for Women in Computer Science and Engineering is to provide mentoring activities targeting women senior graduate students and women just starting as industrial researchers or professors. The workshop is structured to provide with critical information about the culture of and content required for professional research and contacts with successful role models and mentors. Awarded full travel support for workshop attendance and participation - \$1800.

<http://www.cra.org/Activities/craw/projects/mentoring/mentorWrkshp/2007/index.php>

March 8, 2007 – Washington, DC

NSF HRI Pioneers Workshop 2007 - The field of human-robot interaction is new but growing rapidly. While there are now several established researchers in the field, many of the current human-robotic interaction practitioners are students or recently graduated. This workshop, held in conjunction with the HRI 2007 conference, aims to bring together this group of researchers to discuss their work, talk about the important upcoming issues in the field, and hear about what their colleagues are doing. Awarded full travel support to participate in this workshop - \$800. <http://www.hripioneers.org/hri07/>

August 2-6, 2006 – Carmel, CA

NSF Graduate Student Invitational Research Workshop on Human-Robot Interaction - Human-robot interaction (HRI), particularly its social and behavioral aspects, is a nascent field. Today's students will become the leaders who set the direction for future research. The purpose of this workshop is to provide a forum in which these future leaders can network, learn from one another, gain insights into different perspectives on the topic, establish new opportunities for collaborations, and give thought to what is needed to advance this field of inquiry. Awarded full travel support to participate in this workshop - \$2400. <http://peopleandrobots.org/workshop/index.html>

March 31-April 1, 2006 – San Francisco, CA

CRA-W Grad Cohort – Invited to participate in this cohort for second year female graduate students to encourage women to continue in graduate school in the areas of Computer Science and Engineering. Awarded full travel support for attendance \$1300.

<http://www.cra.org/Activities/craw/gradcohort/2006/schedule.php>

February 25-26, 2005 – San Francisco, CA

CRA-W Grad Cohort – Invited to participate in this cohort for first year female graduate students to encourage women to continue in graduate school in the areas of Computer Science and Engineering. Awarded full travel allowance award for attendance - \$1300.

<http://www.cra.org/Activities/craw/gradcohort/2005/schedule.php>

AWARDS, HONORARY, PROFESSIONAL MEMBERSHIPS AND LEADERSHIP

University of South Florida – Tampa, FL

Awards:

King-O'Neal Scholar Award for 4.0 GPA

Computer Science and Engineering Outstanding Graduate Award

Engineering Alumni Society Outstanding Senior of the Year

2001-2002 USF Provost's Scholar Award.

2001-2002 Dean's List of Scholars - USF College of Engineering. (all semesters)

Fellowships:

2009 – 2010 Computing Innovation Postdoctoral Fellowship – Mentor Brian Scassellati at Yale

Fall 2008 Awarded an IEEE Robotics and Automation Society Fellowship (1 awarded per year)

2008 – 2009 Awarded a Mortar Board National Senior Honor Society Fellowship

2005 – 2008 Awarded a National Science Foundation Graduate Research Fellowship

2004 – 2005 Awarded an USF Investing in the Future Graduate Fellowship

Scholarships:

2004 Outstanding Honor Society Member of the Year Award and Scholarship

2003-2004 Awarded the Peter Pempsell Endowed Scholarship

2002-2004 Awarded the USF Women's Club Grace Allen Scholarship

2002-2003 Awarded the USF Computer Science and Engineering Scholarship

2001-2003 Awarded the Community College 2 + 2 scholarship through ATSS

2002-2003 Awarded the USF Honors College scholarship

2001 Golden Key International Honor Society Outstanding Junior Award and Scholarship

2001-2002 Awarded the Honors Program scholarship

2001-2002 Awarded the Open Door Foundation Scholarship

Memberships and Leadership Positions:

Member of the USF Honors College

Member of Tau Beta Pi Engineering Honor Society

Member of USF Mortar Board Senior Honor Society-Athenaeum Chapter

President Spring 2003-Summer 2004, Vice President of Internal Affairs Fall 2002,

Junior Advisor Fall 2004 – Spring 2005, Senior Advisor Summer 2005 – Present

Member of the Honor Society of Phi Kappa Phi

Member of the Golden Key International Honor Society

Member of the Phi Sigma Theta Honor Society

Member of Association for Computing Machinery - Chair Spring 2003-Summer 2005,

Co-Advisor Fall 2005 – Present

Member of IEEE-Computer Society - Administrative Vice President Fall 2002-Spring 2004

Member USF Council of Honor Societies - 1st Vice President of Programs Fall 2003-Spring 2004

Edison Community College-Ft. Myers and Punta Gorda, FL**Awards:**

Dean's List Fall 2000, Spring and Summer 2001 semesters

2000-2001 Phi Theta Kappa-Omicron Epsilon Chapter Outstanding Member of the Year

2000-2001 Who's Who Among American Junior College Students

2001 USAA All-American Scholar

2001 National Collegiate Communication Arts Award

Scholarship:

Awarded Edison Community College's Honors Scholar Program Scholarship

Memberships and Leadership Positions:

2000-2001 Phi Theta Kappa-Omicron Epsilon Chapter – Vice President

2000-2001 Honors Scholar Program Student Executive Board - Secretary

Columbus State Community College-Columbus, OH**Awards:**

Honors designation for every quarter attended (noted on transcript)

Dean's List all quarters over 10.0 credit hours.

4.0 GPA on a scale of 4.0 (while working full-time)

Listed in the 2000 Edition of the National Dean's List-Nominated by Phi Theta Kappa

Scholarships:

1999-2000 Recipient of the JC Penney Endowed Scholarship

1999-2000 Recipient of the Frank P. Gallo S.C.O.R.E. Endowed Scholarship

Membership:

Inducted into Phi Theta Kappa International Honor Society for Two Year Colleges

PROFESSIONAL DATA

Yale University, Postdoctoral Associate – Computing Innovation Postdoctoral Fellow

September 2009 – Present

Duties: Conduct research associated with Human-Robot Interaction using Pleo robots with children diagnosed with autism spectrum disorders. Obtain new skills in conducting human studies with specialized groups of participants. Assist with other research projects; write research grants for future HRI studies through funding agencies such as NSF and NIH.

University of South Florida, Teaching Assistant

December 2008 – August 2009

Duties: Assisting students with assignments and course information. Assist the professor with grading assignments, communication with students, and other duties as assigned.

University of South Florida, IEEE Robotics and Automation Society Fellow and Microsoft Rescue Buddy Project Research Assistant

August 2008 – December 2008

Duties: Conducted the largest human study to date in Human-Robot Interaction with 128 participants and using 4 methods of evaluation (self-assessments, video observation – 4 camera angles, psychophysiology (EKG, Heart Rate, Interbeat Interval, Respiration – using thoracic and abdominal measurements, Skin Conductance Response, Blood Volume Pulse), and participant interviews). Prepared and analyzed data collected. Recruited, trained, and supervised nine volunteer undergraduate research assistants for this research project and study.

University of South Florida, NSF Graduate Research Fellow

June 2005 – May 2008

Duties: Conducted research related to fellowship proposal in the area of Human-Robot Interaction, Affective Computing, Robotics, and Artificial Intelligence. Prepared six publications on this research and presented the findings at conferences, symposia, and workshops.

University of South Florida, ARL Research Grant, Research Assistant

August 2006 – December 2007

Duties: Assisted with research related to social interaction for Urban Search and Rescue (USAR) robotics. As support for this project, I prepared a comprehensive literature review, publications, implemented affect on appearance-constrained USAR robots, and prepared the experimental design and research methods for conducting human studies to determine the effectiveness of non-facial/non-verbal affective expression for keeping victims calm during USAR operations.

University of South Florida, Department of Computer Science and Engineering – College of Engineering Research Assistant

May 2005 – August 2005

Duties: Conduct research related to Human-Robot Interaction, Affective Computing, and Robotics including an extensive literature review related to these areas.

University of South Florida, Department of Graduate Studies, Teaching Assistant

August 2004 – May 2005

Award: Investing in the Future Teaching Assistantship/Fellowship

Duties: Assisted Professor and students in the Program Design course. Graded assignments and exams. Held office hours to assist students with concepts discussed by the course professor and assisted students with applying these concepts to course projects and assignments.

University of South Florida, Department of Computer Science and Engineering, Research Assistant
August 2003 – August 2004

Duties: Analyzed and entered patient data into a web-based expert system through Moffitt Cancer Center. Verified all the rules and inferences in the Automated Clinical Trial Selection expert system. Assisted in the preparation of grant documents and IRB modification documents. Developed a PERL program to extract patient data and transfer it to an input file that was processed by a data mining system to determine associations and inferences that could be found in the database.

University of South Florida, Department of Computer Science and Engineering, Receptionist
January 2002 – October 2002

Duties: Answered phones; assisted students, staff and faculty; performed campus deliveries of materials; and other clerical related duties.

University of South Florida, Department of Computer Science and Engineering, Volunteer Undergraduate Research Assistant with Dr. Abraham Kandel

October 2001 – January 2002

Duties: Performed data analysis testing for software failures. Analyzed datasets and performed statistical and distribution fitting of these datasets to check for goodness of fit. This information was the basis for future work in software testing and the nature of software failures.

Parms & Company, Inc. – Columbus, OH (Regional Certified Public Accounting Firm)

May 1996 – July 2000

Positions: Administrative Accountant, promoted within 6 months to Firm Administrator

Duties: Management of Support Staff; performed all administrative accounting for the firm; responsible for all personnel functions; made purchasing recommendations and planning; responsible for all payroll preparation; setup and maintained Proxy Server for internet access for all members of the firm; performed all upgrades and maintenance of firm computer equipment; assistant Network Administrator for Novell network; planned all firm outings, functions, and activities; actively participated in firm management teams and planning.

SERVICE RELATED ACTIVITIES:

Institute for Safety Security Rescue Technology Research Demonstrations

March 4, 2008 - Research Demonstration for Stewart Tansley of Microsoft Research

April 7, 2008 – Research Demonstration for the Defense Science Research Council (DSRC)

April 30, 2008 – Research Demonstration for DARPA Interns

Duties: Demonstrated to participants the use of non-facial and non-verbal affective expression in Urban Search and Rescue (USAR) robots and applications. Placed participants in a confined space box and let them experience having robots driving toward and near them so they will know the difference between how robots are operated normally in search and rescue environments versus how they would be operated in an emotive mode to help keep located victims calm and make the robots appear less “creepy”.

Institution Service

October 17, 2008 – May 2, 2009

Position: Honors Thesis Director

Duties: Serve as a mentor and honors thesis director for a minority female honors student. Assisted this student through the research process and development of her honors thesis, as well as providing support,

mentoring, and encouragement to pursue a graduate degree in sciences and technology. Typically, only USF faculty has served as honors thesis directors.

January 29, 2008 – March 31, 2009

Position: Chair – CSEWomen at USF

Duties: Started the organization, with the support of the department chair, to provide a support network and resources for both graduate and undergraduate women in Computer Science and Computer Engineering. Organized bi-weekly meetings and made contacts to recruit speakers to help develop skills for the women in the department so that they would feel better prepared for their studies or research. Solicited female faculty to attend meetings as a resource and support system to the women in the department.

October 5, 2007

Position: Panelist

Duties: Participated on a panel with Mary Jane Irwin as part of a CRA-W Initiative to encourage women in computer science and engineering attending USF to consider applying to graduate school, shared knowledge on the preparation process, and answered questions from attendees on what to expect in graduate school.

July/August 2006

Position: Graduate Student Member of Academic Grievance Committee

Duties: Evaluation of a grade grievance submitted by a graduate student outside of the Computer Science and Engineering Department. Evaluated the evidence provided by faculty and student to determine the outcome of the grade grievance in accordance with the College of Engineering and University protocols.

August 2005 – August 2009

Position: Co-Advisor – USF Student Chapter of the Association for Computing Machinery

Duties: Assist faculty co-advisor, student officers and members. Supervise chapter activities and assist with financial planning and funding resources.

May 2004 – August 2009

Position: Advisor – USF Athenaeum Chapter of Mortar Board Senior Honor Society

Duties: Assist and train new society officers and members, supervise chapter activities and finances, complete status reports for the national headquarters.

Summer 2002

Position: Undergraduate Student Selected to Participate in a CSE Focus Group

Duties: I participated as an undergraduate student in a focus group led by Dr. Robin Murphy on how to attract and retain females in the Computer Science and Engineering (CSE) department at the University of South Florida (USF). The task assigned to this group was to read the book “Unlocking the Clubhouse Women in Computing” written by researchers Jane Margolis and Allan Fisher at Carnegie Mellon University (CMU). Our group discussed the book and then compared the environment at CMU with that of the CSE department at USF. The focus group was comprised of both graduate and undergraduate women in the CSE department. Many excellent recommendations developed by the group were presented to the Chair of the CSE department and the Dean of the College of Engineering. One of the recommendations I made that was implemented was to have senior faculty teach some of the entry level courses so that the women who did not have much confidence in their abilities would be able to gain more confidence and build a strong foundation to be successful in this challenging program. Because women enjoy different types of projects than men, the group recommended that instructors change the focus of some of their class projects and/or offer more than one option so that women would have a choice and

find the projects more enjoyable. After talking with several of the women in the department, they felt that the changes were positive and made a difference in their desire to enter and/or remain in the program.

Fall 2001-Spring 2002

Position: Student Representative to the Undergraduate Council at University of South Florida
The Student Government Association appointed this position.

Duties: Participated in the approval process for course changes and new courses. Established new academic policies. Participated in academic hearings including student grievances. Reviewed course requirements for accreditation.

Conference Service

Fall 2009

Position: Reviewer for the Annual Conference on Human-Robot Interaction 2010, Osaka, Japan.

Duties: Reviewed two paper for program committee.

Spring 2008

Position: Reviewer for the 2008 IEEE/RSJ International Conference on Intelligent Robots and Systems, Nice, France.

Duties: Reviewed one paper for the conference program committee.

Fall 2006

Position: Reviewer for the 2nd Annual Conference on Human-Robot Interaction 2007, Washington, DC

Duties: Reviewed two papers for program committee.

Spring 2006

Position: Reviewer for the 2006 15th IEEE Int'l Workshop on Robot and Human Interactive Communication, Hatfield, United Kingdom

Duties: Reviewed two papers for conference program committee.

Fall 2005

Position: Reviewer for the 1st Annual Conference on Human-Robot Interaction 2006, Salt Lake City, UT

Duties: Reviewed three papers for conference program committee.

Journal Service

Fall 2008 – Spring 2009

Position: Reviewer for "Interaction Studies Social Behaviour and Communication in Biological and Artificial Systems", an international journal published by John Benjamins Publishing Company the special issue on "Robots in the Wild: Exploring Human-Robot Interaction in Naturalistic Environments."

Duties: Reviewed one paper for journal Editor-in-Chief.

Fall 2006

Position: Reviewer for IEEE Transactions on Robotics, Special Issue on Human-Robot Interaction.

Duties: Reviewed one paper for journal editors.

Community Service

October 23, 2008 – Benito Middle School – Parents/Students Technology and Robotics Night with IBM

July 22, 2008 - USF Polytechnic – Robots at Gifted & Talented Program

February 21, 2008 - Black Engineering Month and IBM's Tampa Women in Technology event

July 26, 2007 - Take Your Child to Work Day at IBM

June 20, 2007 - 2007 G.R.E.A.T. (Girls Really Excelling at Technology) Camp, hosted by the IBM Tampa Women In Technology

Duties: Performed demonstrations using search and rescue robots and allowed the children to operate the robots. These events provided local underrepresented gifted children in elementary and middle school the opportunity to interact with and operate search and rescue robots. They were taught some basic techniques used in actual search and rescue applications. The purpose was to encourage underrepresented and female students to pursue their education in the areas of science, engineering, and technology to increase gender and minority diversity in these fields.

MAJOR and MINOR RELATED COURSEWORK

Major Emphasis Courses: Introduction to Computer Programming in Visual Basic, Programming Concepts in Java, Program Design in C, Data Structures in C, Operating Systems with OSP Simulations in C, Analysis of Algorithms, Software Engineering, Database System Design with a project implementing an Oracle database with a Java User Interface, Computer Organization, Introduction to Discrete Structures, Computer Logic Design and Lab, Introduction to Probability, Computer Architecture, Linear Algebra, Automata Theory/Formal Languages, User Interface Design, Computational Geometry with project in C, Advanced Discrete Structures and Cryptography, Computer Networks and Distributed Systems, Introduction to Artificial Intelligence, Programming Languages, Graduate Analysis of Algorithms, AI Robotics, Graduate Operating Systems, Graduate Computer Architecture, Advanced Robotics, and Introduction to Homeland Security Technologies, Introduction to Computer Graphics.

Minor Emphasis Courses: Cognitive Psychology, Psychophysiology, Human Factors, and Applied Statistical Analysis I, II, and III.