

My research focuses on making it easier to interact with technology using new kinds of sensing on the human body. In particular, I focus on applications for virtual and augmented reality using sensors that capture information about the fingers, eyes, and face. I specialize in projects at the intersection of hardware and software and draw on my diverse skill set in rapid prototyping, signal processing, machine learning, and human-computer interaction. Currently, I'm a PhD student in Computer Science & Engineering at the University of Washington. I am advised by Shwetak Patel and work in the Ubiquitous Computing Lab. I am currently seeking opportunities for internships and collaborations.

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EDUCATION

- 2014 – Present **University of Washington (UW)**, Seattle, WA
PhD student in Computer Science & Engineering
Advisor: Shwetak Patel
- 2010 – 2014 **North Carolina State University (NCSU)**, Raleigh, NC
Park Scholarship Recipient
Bachelor of Science in Computer Science
Bachelor of Science in Biomedical Engineering
Minor in Cognitive Science
GPA: 4.00 / 4.00

HONORS, GRANTS, AND AWARDS




- 2016 Best Paper Award at ISWC 2016 for EyeContact [C9]
Best Paper Nominee at CHI 2016 for SpiroCall [C8]
- 2015 Runner-Up Research Prize from Madrona Ventures for HyperCam Poster [C7]
Best Paper Nominee at UbiComp 2015 for HyperCam [C7]
- 2014 National Defense in Science and Engineering Graduate (NDSEG) Fellowship
National Science Foundation GRFP Honorable Mention
Best Student Poster Award at GOMACTech 2014 for [C2]
- 2013 Barry M. Goldwater Scholarship
Autonomy Research Seed Grant
NCSU Undergraduate Research Grant
Best Poster Award at NCSU Undergraduate Research Symposium for [C1]
1st Place at NCSU Student Programming Competition
- 2012 NCSU Undergraduate Research Grant
- 2011 Donald Bitzer Creativity Award
- 2010 Park Scholarship (4 year award for scholarship, service, leadership, and character)


RESEARCH AND PROFESSIONAL EXPERIENCE

- 2014 – present **Ubiquitous Computing Laboratory**, University of Washington
Graduate Researcher (Advisor: Shwetak Patel)
Exploring wearable, on-body sensing for virtual and augmented reality

- Summer, 2016 **Oculus Research**, Research Intern, Redmond, WA
 Research Intern (Advisor: Laura Trutoiu, Kenrick Kin)
 Explored alternative input techniques for augmented reality applications
- Summer, 2015 **Oculus Research**, Research Intern, Redmond, WA
 Research Intern (Advisor: Laura Trutoiu, Rob Cavin)
 Developed a high-accuracy scleral coil eye tracking attachment for virtual reality displays
- 2012 – 2014 **Integrated Bionic Microsystems Laboratory**, North Carolina State University
 Undergraduate Researcher (Advisor: Alper Bozkurt)
 Developed automation platform using image processing and wireless communication to electrically stimulate and steer insects for search and rescue applications
 Designed an insect-mounted microphone array for sound localization
- Summer, 2013 **Microsoft**, Xbox One / Kinect Speech Platform Team, Redmond, WA
 Software Development Intern (Supervisor: Jonathan Campbell)
 Designed and implemented new API for multimodal Kinect interactions
- Summer, 2012 **Microsoft**, Internet Explorer Web Programming Team, Redmond, WA
 Software Development Intern (Supervisor: Harley Rosnow)
 Designed and implemented HTML 5 Dataset feature that shipped in IE 11
- Summer, 2011 **IBM**, IBM Systems Director Installation Team, Research Triangle Park, NC
 Software Development Intern (Supervisor: David Cole)
 Developed a cross-platform Python validation utility for IBM Systems Director
- 2010 – 2012 **RiboLab**, North Carolina State University
 Undergraduate Researcher (Advisor: Donald Bitzer)
 Developed optimization algorithms to test and improve computational model
 Conducted statistical analysis of E. coli genome to validate model

REFEREED CONFERENCE PUBLICATIONS

- 2016 C9.  *EyeContact: Scleral Coil Eye Tracking for Virtual Reality*
Eric Whitmire, Laura Trutoiu, Robert Cavin, David Perek, Brian Scally, James O. Phillips, Shwetak Patel
 ISWC 2016 (Acceptance Rate: 22%) **Best Paper Award (Top Paper)**
- 2015 C8.  *SpiroCall: Measuring Lung Function over a Phone Call*
 Mayank Goel, Elliot Saba, Maia Stiber, **Eric Whitmire**, Josh Fromm, Eric Larson, Gaetano Borriello, Shwetak Patel
 CHI 2016 (Acceptance Rate: 23%) **Best Paper Nominee (Top 5%)**
- 2015 C7.  *HyperCam: Hyperspectral Imaging for Ubiquitous Computing Applications*
 Mayank Goel, **Eric Whitmire**, Alex Mariakakis, Scott Saponas, Neel Joshi, Dan Morris, Brian Guenter, Marcel Gavriiliu, Gaetano Borriello, Shwetak Patel
 UbiComp 2015. (Acceptance Rate: 22%) **Best Paper Nominee (Top 5%)**
- 2014 C6. *Acoustic Sensors for Biobotic Search and Rescue*
Eric Whitmire, Tahmid Latif, Alper Bozkurt
 IEEE Sensors 2014
- C5. *Microfabricated impedance sensors for concurrent tactile, biopotential, and wetness detection*
 Feiyan Lin, Michael McKnight, James Dieffenderfer, **Eric Whitmire**, Tushar Ghosh, Alper Bozkurt
 IEEE Sensors 2014
- C4. *Solar Powered Wrist Worn Acquisition System for Continuous Photoplethysmogram Monitoring*
 James P. Dieffenderfer, Eric Beppler, Tristan Novak, **Eric Whitmire**, Rochana Jayakumar, Clive Randall, Weiguo Qu, Ramakrishnan Rajagopalan, Alper Bozkurt
 IEEE EMBC 2014

- C3. *Toward Fenceless Boundaries for Solar Powered Insect Biobots*
Tahmid Latif, **Eric Whitmire**, Tristan Novak, Alper Bozkurt
IEEE EMBC 2014
- C2. *Cyber-physical Network of Terrestrial Insect Biobots*
 **Eric Whitmire**, Tahmid Latif, Alper Bozkurt
GOMACTech 2014 **Best Poster Award (Top student poster)**
- 2013 C1. *Kinect-based System for Automated Control of Terrestrial Insect Biobots*
Eric Whitmire, Tahmid Latif, Alper Bozkurt
IEEE EMBC 2013

REFEREED JOURNAL PUBLICATIONS

- 2016 J1. *Sound Localization Sensors for Search and Rescue Biobots*
Tahmid Latif, Eric Whitmire, Tristan Novak, Alper Bozkurt
IEEE Sensors Journal, Vol. 16, Issue 10

INVITED TALKS

- 2016 T2. UW Computer Science & Engineering Industrial Affiliates
EyeContact: Scleral Coil Eye Tracking for Virtual Reality
- 2013 T1. UNC and NCSU Annual BME Research Retreat
Kinect-based system for automated control of terrestrial insect biobots

PATENTS

- 2016 P2. Patent application filed with USPTO in 2016 with Oculus Research
- 2015 P1. Patent application filed with USPTO in 2015 with Oculus Research

ADVISING AND MENTORING

- Spring 2016 - present **Andrew Luo**, UW undergraduate in Computer Science & Engineering
Developing automated analysis for quality control of spirometry efforts
- Fall 2016 - present **Divye Jain**, UW undergraduate in Computer Science & Engineering
Designing HoloLens framework for text entry experimentation

TEACHING EXPERIENCE

- Spring 2015 **Guest lecturer in UW CSE590P: Advanced Topics in Ubiquitous Computing**
Designing an Enclosure using AutoDesk Inventor
- Fall 2014 **Tutor for UW CSE312: Foundations of Computing II**
- Spring 2015 **Tutor for UW CSE312: Foundations of Computing II**

GRADUATE COURSEWORK

Natural Language Dialogue Systems (with Kirsty Boyer, NCSU)
Bioelectricity and Neural Interfaces (with Alper Bozkurt, NCSU)
Machine Learning (with Carlos Guestrin)
Security and Privacy (with Franziska Roesner)
Design and Analysis of Algorithms (with Anna Karlin)
Computer Graphics (with Brian Curless)
Advanced Topics in Human Computer Interaction (with James Fogarty)
Computer Networks (with Shyam Gollakota)

LEADERSHIP, SERVICE, AND OUTREACH

Reviewer

EMBC (2015)
UbiComp (2016)
CHI (2016, 2017)
IEEE Transactions on Sensors (2016)
ACM SAP (2016)
UIST (2016)

Student Volunteer

UbiComp (2014)

2015 – present **FIRST Technical Challenge High School Mentor**

Coached a team of high school students in designing, building, and programming a robot

2010 – 2014 **Service Raleigh Committee Head**

Helped plan annual service event with 2000 volunteers in the Raleigh, NC area

2010 – 2014 **Mentor for Students in Programming Robotics and Computer Science**

Developed and led weekend workshops and hands-on learning activities for middle school students

TECHNICAL SKILLS

Design	Photoshop, Illustrator, Premiere, InDesign, SolidWorks, Inventor, PCB Layout
Modeling	Machine learning, nonlinear optimization (Ceres), Deep learning (TensorFlow), probabilistic modeling
Libraries and Platforms	Android, Arduino, Unity, OpenCV, TI CC25xx, Bluetooth LE
Programming	C/C++, C#, Python, MATLAB, VBA, Web development (Client and server side), MySQL
Fabrication	3D printing, laser cutting, CNC machining, PCB etching