Research Statement

My dissertation is on creating smartphone apps that systematize and automate the ways that doctors use their senses - sight, hearing, touch, smell, and taste - to detect symptoms more accurately, precisely, and consistently. My graduate work has focused on diagnosing conditions that manifest through symptoms in the eye, including jaundice for pancreatic cancer and non-responsive pupils for traumatic brain injuries. My projects cover a wide array of skills, including machine learning, computer vision, signal processing, and user interface design.

Education

University of Washington
Computer Science and Engineering MS, PhD
Advisors: Dr. Shwetak Patel and Dr. Jacob Wobbrock

Duke University
Electrical and Computer Engineering BSE, Computer Science BS
Advisor: Dr. Romit Roy Choudhury

Teaching

University of Washington

CSE 190B: CSE Direct Admission Freshman Seminar (guest lecture) . . . . Fall 2016, Fall 2017
CSE 331: Software Design and Implementation . . . . . . . . Fall 2013, Winter 2013, Spring 2014

Mentoring:
- Vardhman Mehta (undergraduate, now Master’s at UW): PupilScreen neural networks
- Megan Banks (undergraduate): BiliScreen and PupilScreen app development
- Surabhi Mundanda (high schooler, now at Stanford): Measuring tremor with a smartwatch

Duke University

ECE 559: Advanced Digital System Design . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Spring 2013
ECE 54/280: Introduction to Signals and Systems . . . . Spring 2011, Spring 2012, Fall 2012
ECE 52: Introduction to Digital Systems . . . . . . . . . . . . . . . . . . . . . . . . . . . . Fall 2011
EGR 224: Electrical Fundamentals of Mechatronics . . . . . . . . . . . . . . . . . . . Spring 2013
EGR 53/103: Computational Methods in Engineering . . . . . . . . Fall 2010, Fall 2011, Fall 2012

Awards, Grants & Honors

University of Washington

Qualcomm Innovation Fellowship . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Fall 2015
NSF Graduate Research Fellowship . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Fall 2014

Duke University
Graduation Cum Laude .................................................. Spring 2013
Graduation with Departmental Distinction .......................... Spring 2013
Tau Beta Pi ................................................................. Spring 2013
Outstanding Teaching Assistant Award (ECE) ................... Spring 2012
Pratt Research Fellowship ............................................. Fall 2012

Service

Reviewer for CHI (3 years), UbiComp (3 years), UIST (2 years), ACM SAP (1 year), IEEE VR (1 year),
IEEE Pervasive Computing (1 year)

Graduate school application reader and student coordinator

Graduate student coordinator for DUB organization

Co-head organizer of DUB’s inaugural Doctoral Colloquium

Active participant in the University of Washington’s DawgBytes and Discover Days programs

At least 100 lab tours and demos for a variety of visitors, including politicians (Senator Maria Cantwell),
military officials (General Kevin Chilton), visiting faculty (Andy van Dam, Raj Reddy), K-12 teachers,
and countless undergrads, grads, and high schoolers.

Industry Experience

**FX Palo Alto Laboratory**
Palo Alto, CA
Mentor: Daniel Avrahami
Developed interface that facilitates the discovery of coincidences and similarities in collections of
egocentric videos

**Samsung Research America**
San Jose, CA
Mentors: Vijay Srinivasan, Kiran Rachuri, Evan Welbourne
Explored the application of inertial and image sensing in smartwatches for driving and eating detection

**HP Labs**
Palo Alto, CA
Mentor: Souvik Sen
Worked on enterprise-scale indoor localization system that combines Wi-Fi ranging and inertial dead
reckoning

**Lutron Electronics**
Coopersburg, PA
Mentor: Ryan Bedell
Developed software for automatic PIR occupancy sensor tests and mass microcontroller programming

Ongoing Projects

**PupilScreen**
Using the smartphone camera to get an absolute measurement of a patient’s pupil size and pupillary
response for the diagnosis of head trauma.

**BiliScreen**
Using the smartphone camera to estimate the amount of jaundice that appears in the sclera of a patient's eye for predicting pancreatic cancer.

**Mobile Tonometer**

Using the smartphone camera and minimal instrumentation to replicate fixed-force tonometry for the measurement of intraocular pressure, which eventually leads to the diagnosis of glaucoma.

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**Selected Press**

**BBC News**: Selfie app “spots early signs of pancreatic cancer”

**GeekWire**: Univ. of Washington researchers developing smartphone app that can detect concussions

**UW CSE News**: 10th Anniversary of UW CSE’s CS4HS

**UW CSE News**: Changing the world: Faculty and students demonstrate CSEs impact to the UW Foundation Board

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**Invited Talks**


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**Accepted Papers**


Patents


