Joseph Breda

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Research Interest

Ubiquitous Computing, Human Computer Interaction, Urban Sensing, Social Sensing, Health Sensing

Education

University of Washington   Sep. 2019 - Present
Ph.D., Computer Science & Engineering. Advisor: *Shwetak Patel*

University of Massachusetts Amherst   Sep. 2015 - May 2019
Bachelor of Science in Computer Engineering & Minor in Computer Science. Advisor: *Jay Taneja*
Magna cum Laude, **GPA**: 3.84/4.00

Conference Publications

- **Joseph Breda**, Amee Trivedi, Chulabhaya Wijesundara, Phuthipong Bovornkeeratiroj, David Irwin, Prashant Shenoy, Jay Taneja "Hot or Not: Leveraging Mobile Devices for Ubiquitous Temperature Sensing." In ACM BuildSys Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys 2019), November 2019.

- **Joseph Breda** and Jay Taneja "Fancy That: Measuring Electricity Grid Voltage Using a Phone and a Fan." In the First ACM SIGCAS Conference on Computing and Sustainable Societies (COMPASS 2018), June 2018.

- Dong Chen, **Joseph Breda**, and David Irwin "Staring at the Sun: A Physical Black-box Solar Performance Model." In the 5th International Conference on Systems for Energy-Efficient Built Environments (BuildSys 2018), November 2018.

Research Projects

Ubicomp Lab: Graduate Research Assistant   Sep. 2019 - Present
- Designing system for estimating feverish core body temperature using mobile phones for ubiquitous and accessible influenza surveillance

STIMA Lab: Undergraduate Research Assistant   Sep. 2018 - July 2019
- Designed a system combining activity recognition and physical models in specific states to map battery temperature of mobile phones to indoor ambient air temperature
- Developed Android application for collecting data and making temperature estimates in real-time
- Published in BuildSys 2019

STIMA Lab: Undergraduate Research Assistant   Sep. 2017 – Mar. 2018
- Developed system using mobile phones to measure electrical grid power quality to assist in brown-out detection in the developing world
- Created algorithm in Python & Matlab to analyze harmonic distortion in audio signal caused by nearby spinning fan blade to provide a proxy measurement for grid level voltage powering fan
- Published in COMPASS 2018

Sustainable Computing Lab: Undergraduate Research Assistant   May 2017 – Aug. 2017
- Developed Python data-mining script to web-scrape millions of weather forecast points and associated solar performance metrics using Beautiful Soup and XML queries
- Cleaned data and construct a database relating solar performance data to respective weather forecasts using Pandas
- Published in BuildSys 2018

Industry

Staples Inc.   Framingham, MA
Cloud Computing Software Engineering Intern   May 2018 – Aug. 2018

- Designed and implemented a GUI to aggregate and display cost of cloud operation and present price estimates for provisioning resources to nontechnical co-workers using React and Flask
- Developed a full stack architecture with REST API to transfer state between client and server
- Retrieved cloud cost data from Microsoft Azure using Python web-scraping script and Azure API calls and stored price estimates using SQL in Cosmos DB

Awards & Honors

Graduated from Commonwealth Honors College   May 2019
Graduated Magna Cum Laude   May 2019
Commonwealth Honors College: Honors Research Grant   December 2018

Skills

Skills & Interests: Statistical Learning, Secondary Sensing, Modeling, Signal Processing, Data Mining, Empirical Study, Ubiquitous Computing

Languages: Python, Java, JavaScript, C

Frameworks & Technologies: SKLearn, NumPy, Android, PyTorch, React, Flask, Git, Matlab, SQL, Linux, Bash