Joseph Breda

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Education

University of Washington Sep. 2019 - Present
Ph.D. Student at Paul G. Allen School of Computer Science & Engineering

University of Massachusetts Amherst Sep. 2015 - May 2019
Graduated Magna cum Laude with Bachelor of Science in Computer Engineering & Minor in Computer Science
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.

Projects

STIMA Lab: Using Smartphones to Determine Ambient Indoor Air Temperature Sep. 2018 - July 2019

- Designing and developing machine learning model to be run on Android to estimate ambient indoor air temperature using just battery temperature and CPU usage readings as part of honors thesis
- Developing Android application for collecting training data and making predictions
- Developing mobile phone activity recognition model to predict mobile phone activity/context from physical hardware sensor measurements

UMass ECE Department: Senior Design Project '19: Automated Piano Tutor Sep. 2018 - May 2019

- Leading team of 4 engineers in the design and development process for a senior year capstone project
- Developing real-time note recognition program in Python to distinguish piano notes from ambient noise and to identify note as part of embedded system designed by team

STIMA Lab & Lab11: OINK (Open INcentive Kit) Mar. 2018 – May 2018

- Developed open source API using JavaScript and Google Firebase for administering automated payments as incentives for in-app activities on a small team of engineers at UMass and UC Berkeley
- Designed queue for accepting HTTP requests and link to proper relational table

STIMA Lab: Undergraduate Researcher Sep. 2017 – Mar. 2018

- Published peer-reviewed research paper "Fancy That: Measuring Electricity Grid Voltage Using a Phone and a Fan" as first-author on 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 fan blade RPM to provide a proxy for grid level voltage powering fan
- Presented research paper at ACM COMPASS 2018 conference on Computing and Sustainable Societies

Sustainable Computing Lab: Undergraduate Researcher May 2017 – Aug. 2017

- Published peer-reviewed, co-authored research paper "Staring at the Sun: A Physical Black-box Solar Performance Model" at ACM BuildSys conference 2018
- Developed program in Python to data-mine and construct a database of millions of solar metrics used to predict daily solar panel performance from weather forecast data using Pandas
- Data mined weather and solar metrics using Beautiful Soup web scraping and XML data querying

Industry

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

- Designed and implemented a GUI to display aggregate cloud operational cost data and provide price estimates for provisioning resources using React frontend and Flask backend
- 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: Java, Python, JavaScript, C
Frameworks & Technologies: SKLearn, NumPy, Android, PyTorch, React, Flask, Git, Matlab, SQL, Linux, Bash