REESE GRIMSLEY

Curriculum Vitae

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EDUCATION

Carnegie Mellon Universi	ty — Ph.D. in Comp	uter Engineering, Silicon Valley,	Мау
CA & Pittsburgh, PA			2024
GPA: 4.0 Completed Credits: 37 (approx. 13 hrs)		(est.)	
Focus in Internet of Things Systems, Hardware/Software Interface, Remote			
Programmability			
Texas A&M University – Bachelor of Science in Electrical Engineering,			May
College Station, Texas			2019
Cumulative GPA: 3.97	Major GPA: 3.95	Completed Hours: 140	
Focus in Computer Engine	ering, Embedded Sy	stems, Signal Processing	
Minor in Business, Minor in	Mathematics		

RESEARCH EXPERIENCE AND PROJECTS

Research Assistant — Carnegie Mellon University, Silicon Valley, Computation and Communication Structures Group, PI Dr. Bob Iannucci <i>TickTalk: Timing API for Federated Cyber-Physical Systems</i>	Aug. 2019 To Present
 Extend the programmability of Federated CPS/IoT to non-specialist programmers Build timing and power constructs as first-class citizens into programming semantics of a home-grown, portable, intermediate language 	Tresent
 Hardware virtualization to enable concurrent multi-tenant applications on resource-constrained hardware Developed Cyber Physical System simulator to execute programs using the Dataflow model of computation 	
 Developing a new sensor hardware platform for low power, high performance computing for use in IoT applications Designed several iterations with Cortex-M4F processor, LoRa radio, SD card, and power supply to run at <65 μA in sleep state with extensible interface for sensor/actuator/radio-laden PCBs Orchestrated production, hand-built and tested prototypes, and integrated with existing development environment for each iteration 	

Pepperwood Preserve Stream Monitoring with U.S. Geological Survey

- Building and supporting a deployment of environmental sensors for monitoring stream heights as part of an early flood warning system in partnership with the USGS
- Firmware and server development to support over-the-air reprogramming, lower average energy expenditure, and improve robustness during network failures

Undergraduate Research Assistant — Texas A&M EngineeringFeb. 2017Experiment Station, Embedded Signals Processing Lab, PI Dr. RoozbehToJafariMay 2019

A Robust User Interface for IoT using Context-aware Bayesian Fusion

- Developed a framework for a robust user interface fusing hand gestures and speech queries
- Integrated a microcontroller with accelerometer, gyroscope, and magnetometer data collection via an inertial measurement unit (IMU) for gesture recognition
- Leveraged COTS speech-to-text for speech recognition, smart-home device control

Context-Aware Activity Recognition using Bluetooth Low Energy for Unsupervised User Localization

- Developed app for Android watch to collect acceleration, angular velocity, heartrate, and local BLE devices
- Extracted statistical features from acceleration, angular velocity and heart rate; contextual features extracted from timestamps and BLE scans
- Evaluated data through traditional Machine Learning algorithms, e.g., SVM, Naïve Bayes, with accuracy of 96%
- Model logical location using local Bluetooth beacons without prior knowledge of beacon location or interrelations

PUBLICATIONS

Journal Articles

J1. A. Akbari, R. Grimsley, and R. Jafari, "Data-driven Context Detection Leveraging Passively Sensed Nearables for Recognizing Complex Activities of Daily Living," ACM Transactions on Computing for Healthcare vol. 2, no.2, pp. 1-22, January 2021

Conference Articles

C5: R. Grimsley, M. Marineau, R. Iannucci, "Experience sin LP-IoT: EnviSense Deployment of Remotely Reprogrammable Environmental Sensors", 1st ACM International Workshop on No Power and Low Power Internet of Things, October 25, 2021, New Orleans, Louisiana, United States.

- **C4:** J. Nguyen, R. Grimsley, R. Iannucci, "TrafficNNode: Low Power Vehicle Sensing Platform for Smart Cities", *IEEE 5th International Conference on Smart Internet of Things*, August 13-15, 2021, Jeju Island, South Korea.
- **C3.** A. Akbari, J. Wu, R. Grimsley, and R. Jafari, "Hierarchical Signal Segmentation and Classification for Accurate Activity Recognition", *ACM SHL Recognition Challenge in sixth International Workshop on Human Activity Sensing Corpus and Applications, in conjunction with UbiComp*, October 12, 2018, Suntec City, Singapore.
- **C2.** J. Wu, A. Akbari, R. Grimsley, R. Jafari, "A Decision Level Fusion and Signal Analysis Technique for Activity Segmentation and Recognition on Smart Phones", *ACM SHL Recognition Challenge in sixth International Workshop on Human Activity Sensing Corpus and Applications, in conjunction with UbiComp*, October 12, 2018, Suntec City
- **C1.** J. Wu, R. Grimsley, R. Jafari, "A Robust User Interface for IoT using Context-aware Bayesian Fusion", *IEEE International Conference on Wearable and Implantable Body Sensor Networks*, March 4-7, 2018, Las Vegas, NV, USA.

INVITED TALKS

- **T2:** R. Grimsley, "IoTAssembly: Device Architecture and Compilation Target for the IoT", Nov. 2020, *Temporal Programming Research for Edge/IoT at CMU: An Introduction for Intel*
- **T1:** R. Grimsley, "A Robust User Interface for IoT using Context-aware Bayesian Fusion", *IEEE International Conference on Wearable and Implantable Body Sensor Networks*, March 4-7, 2018, Las Vegas, NV, USA.

RESEARCH INTERESTS

Cyber Physical Systems, Embedded Systems, Distributed Systems, Internet of Things (IoT), Heterogeneous Systems, Edge/Fog Computing, Smart Infrastructure/Cities, Environmental Sensing, Low Power Wide Area Networks (LPWAN), Dataflow, Models of Computation

JOB EXPERIENCE

Applications Engineer Intern – Texas Instruments	May 2019
Continuation of previous internship related to deep learning for	То
image processing on embedded microprocessors	Aug. 2019
 Development of software for automated labeling of bounding 	
boxes in controlled setting with supporting image collection	

software for two distinct stereo depth cameras

 Dataset creation of basic manufacturing components for detection models in support of 6-axis pick-and-place manufacturing robots 	or object
Applications Engineer Intern – Texas Instruments	May 2018
 Created Deep Learning models in Caffe for image clas and pixel segmentation to be implemented on an ember system 	sification To dded Aug. 2018
 Developed a tool to automate image labeling at pixel-le granularity 	vel
 Published an application note detailing the process for Deep learning model from data collection to training to the model on an embedded platform 	creating a testing
 Peer Teacher — Texas A&M College of Engineering Instructed study groups of 10-12 freshmen, emphasizin problem solving skills Guided students in their education of engineering concepts/programs such as Matlab, LabVIEW, Excel, setc. 	Aug. 2017 To Mar. 2017 tatistics,
 Evaluated students on their term-long projects and presentations; graded assignments, quizzes, and examination Center Field Support Intern — ArcBest Technology 	ns Nogies May 2015
 Diagnosed and solved issues with faulty PDAs for logis personnel Initiated replacement of outdated PCs for logistics term branches around the US, generating invoices according Communicated with terminal managers to coordinate e of PDAs and related according 	indices May 2013 tics To Aug. 2015 inals and gly xchanges

PROFESSIONAL AFFILIATIONS

IEEE Student Member – Texas A&M Chapter

- Attended workshops for learning various programming languages
- Joined the chapter for the annual Big Event, a campus-wide community service project
- Assisted incoming freshmen with meeting professors in the department and touring the facilities

TECHNICAL SKILLS

Programming Skills: C/C++, Embedded C, NodeJS, Python, Matlab, Java, Verilog,

2019

2017

Hardware Skills: PCB Design, Surface Mount Assembly, Hardware Debugging in Embedded Systems, Power Analysis

GRANTS AND AWARDS

2nd Place in CPS-Week Student Design Competition for Networked Computing at the Edge: "TickTalk: One Program to Rule the Intersection" 2021

- Led team of 4 students to 2nd place (among 12 teams) with an award of \$600
- Implemented abstractions for handling time and communication in distributed, time-sensitive applications
- Evaluated on smart-intersection application using 1/10th scale autonomous vehicles equipped with Nvidia Jetsons

NSF GRFP Honorable Mention

 Submitted application for the NSF Graduate Research Fellowship as an undergraduate senior, receiving an honorable mention

NSF Travel Award for IEEE Body Sensor Networks (BSN) Conference 2018

- Awarded \$500 for travel to the IEEE BSN conference in Las Vegas, Nevada, colocated with Journal of Biomedical and Health Informatics
- Enabled presentation (T1) of a co-authored paper (C1)

Undergraduate Summer Research Grant (REU)

- Summer-long program for undergraduate students interested in research
- Awarded a stipend of \$6,500
- Required submission of a research paper and poster presentation