Sharan **Ramjee**

Undergraduate Student at Purdue University

(+1) 765-772-6865 | sramjee@purdue.edu | sharanramjee.github.io | sharanramjee | sharanramjee

Research Interests

Computer Vision, Signal Processing, Machine Learning, Deep Learning, and Artificial Intelligence

Education

Purdue University

West Lafayette, IN

Bachelor of Science in Computer Engineering with Minors in Mathematics and Economics

Aug. 2016 - Exp. May. 2020

- Department of Electrical and Computer Engineering, GPA: 4.00/4.00

Experience

Qualcomm

San Diego, CA

Machine Learning Intern

May. 2019 - Aug. 2019 (Present)

- Working with the ML Application Analysis Team on using Deep Learning to make Qualcomm Snapdragon chips more power efficient
- Upgrading the automation tool of the QoS logger to run multimedia applications on Android P and parse log files
- Generating LSTM models using Neural Architecture Search (NAS) to estimate QoS parameters for minimal power consumption

DARPA SC2 Research

West Lafayette, IN

Research Assistant

May. 2018 - Present

- Researcher at the Purdue DARPA SC2 Research Team (BAM!) in collaboration with Texas A&M [LINK]
- Qualified for the final round (will take place in Dec 2020) of the DARPA SC2 challenge and won $750,000 in funding from DARPA for finishing in the top 10 teams in the 1st round and $375,000 for finishing in the top 5 teams in the 2nd round

SURF 2018

West Lafayette, IN

Research Fellow

May. 2018 - Aug. 2018

- Designed Deep Learning models for modulation classification with a focus on online training for network tuning using PCA, LDA and Autoencoders aided by selective SNR trainingd Wireless Signal Modulation Classification using Deep Neural Networks with Prof. Aly El Gamal [LINK]
- Currently hold the record for the highest classification accuracy (99%) with the RML dataset (previous record – 93%)

Publicis.Sapient

Bengaluru, India

Data Science Intern

May. 2017 - Jul. 2017

- Rebuilt the "pandas" library in python and converted it into libraries in Apache Spark, Apache Flink, and TensorFlow
- Created clusters in TensorFlow for generating a distributed network that enabled efficient data processing
- Performed big data analytics using Apache Spark, Hadoop and Microsoft Azure

Publications

Accepted/Published

[$C1$] Xiwen Zhang, Tolunay Zeyfi, Shengtai Ju, **Sharan Ramjee**, Aly El Gamal, Yonina C. Eldar. "Deep Learning for Interference Identification: Band, Training SNR, and Sample Selection". IEEE Signal Processing Advances in Wireless Communications **(SPAWC)**, 2019 [LINK]

[$J1$] **Sharan Ramjee**, Shengtai Ju, Diyu Yang, Xiaoyu Liu, Aly El Gamal, Yonina C. Eldar. "Fast Deep Learning for Automatic Modulation Classification". Submitted to IEEE Journal on Selected Areas in Communications **(JSAC)**, 2019 [PREPRINT]

Under Review

[$C2$] **Sharan Ramjee**, Aly El Gamal. "Efficient Wrapper Feature Selection usingAutoencoder and Model Based Elimination". Submitted to Neural Information Processing Systems **(NIPS)**, 2019 [PREPRINT]

[$J2$] **Sharan Ramjee**, Shengtai Ju, Diyu Yang, Xiaoyu Liu, Aly El Gamal, Yonina C. Eldar. "Data Driven Subsampling for Automatic Modulation Classification". Submitted to IEEE Transactions on Cognitive Communications and Networking **(TCCN)**, 2019

[$J3$] Xiwen Zhang, **Sharan Ramjee**, Tolunay Seyfi, Shengtai Ju, Aly El Gamal, Yonina C. Eldar. "Band Selection using Deep Learning for Interference Identification". Submitted to IEEE Transactions on Cognitive Communications and Networking **(TCCN)**, 2019

Talks

Deep Learning for Interference Identification: Band, Training SNR, and Sample Selection — *Cannes, France*
IEEE Signal Processing Advances in Wireless Communications (SPAWC) 2019 [link] — *Jul. 2019*

Deep Neural Network Architectures for Modulation Classification using PCA — *West Lafayette, IN*
The Summer Undergraduate Research Fellowship (SURF) Symposium [link] — *Aug. 2018*

A PyTorch Framework for Automatic Modulation Classification — *West Lafayette, IN*
The Summer Undergraduate Research Fellowship (SURF) Symposium [link] — *Aug. 2018*

Honors & Awards

Eli Shay Scholarship, (3 times) Purdue University — *2017-2019*
Wolfram Alpha Award, MadHacks (University of Wisconsin-Madison) — *Nov 2018*
Dean's List, (6 times) Purdue University — *2016-2019*
Engineering Design Excellence Award, Purdue University — *Dec. 2016*
12th Board Exam Scholarship, DRDO — *2016*
OpenMRS Award, Google Code-In — *Dec. 2014*
10th Board Exam Scholarship, DRDO — *2014*

Activities

Purdue IEEE Computer Society (CSociety) — *West Lafayette, IN*
President [LINK] — *Aug. 2017 - Present*

- Led several teams in the completion of projects for the Purdue Spark Challenge that is held every semester
- Served as the product manager for the 'Neural Style Transfer using Hardware Convolution' project (Spring 2019) and served as the head of the data analysis team for the 'QUEVIHN: Biomedical Robot' project (Fall 2018) [LINK]

Autonomous Motorsports Purdue (AMP) — *West Lafayette, IN*
Software Team Lead [LINK] — *Nov. 2018 - Present*

- Led the software team for the development of SLAM algorithms in preparation for the autonomous racing competition held every May [LINK]
- Successfully developed computer vision software using the YOLOv2 for the Velodyne LiDAR [LINK]
- Created on-boarding documents to get new recruits up to speed with the Robot Operating System (ROS) framework

Undergraduate Research Society of Purdue (UGRSP) — *West Lafayette, IN*
Founding Ambassador [LINK] — *Oct. 2018 - Present*

- Served as the founding ambassador for the College of Engineering to help guide students with research
- Taught students how to present their research, conduct literature reviews, write journal/conference papers
- Engaged in outreach and spreading awareness to recruit a diverse group of students that were passionate about research

Teaching Assistant

Microprocessor Systems and Interfacing — *West Lafayette, IN*
ECE 362 — *Spring 2019*

ASIC Design Laboratory — *West Lafayette, IN*
ECE 337 — *Spring 2019*

Advanced C Programming — *West Lafayette, IN*
ECE 264 — *Spring 2019*

Electronic Measurement Techniques — *West Lafayette, IN*
ECE 207 — *Fall 2018*

Programming Applications For Engineers — *West Lafayette, IN*
CS 159 — *Spring 2018*

Skills

Languages Python, C, Java, Shell Scripting, MATLAB
Hardware System Verilog, Embedded C, Assembly
Libraries Keras, TensorFlow, scikit-learn, OpenCV
Other Git, LaTeX
OS Android, ROS, Linux (Ubuntu)

Projects

StrataGem | Fintech Android App

Madison, WI

MadHacks 2018 – University of Wisconsin-Madison [LINK] *Nov. 2018*

- StrataGem is an integrated platform to take care of all your finances - Personal Banking to Investment Advisory
- Won the “Wolfram Alpha Award” sponsored by Wolfram Alpha and the ”Best Payment Solution” award sponsored by Authorize.net
- Written in Java and XML for Android with ML merger prediction and sentiment analysis algorithms written in Python

Vitamin.AI | Health & Fitness Android App

West Lafayette, IN

BoilerMake VI – Purdue University [LINK] *Oct. 2018*

- Vitamin.AI is a Computer Vision driven health & fitness tracking Android App that is an upgrade to FitScan, another android app I made in 2017 [LINK]
- Uses Google Cloud Vision API to classify brand names and AR to detect the size/calories of the products consumed
- Automatically schedules a run for the user using Google Maps APIs so that the user burns the calories that were consumed on that day

USB AHB-Lite | ASIC SoC Module

West Lafayette, IN

SoC Team *Dec. 2018*

- USB Full-Speed Bulk-Transfer Endpoint AHB-Lite SoC Module facilitates bulk transfers of data from a USB Endpoint to a Host
- Coded in SystemVerilog with an emphasis on the ASIC design aspects with regards to the AHB-Lite Slave Interface, Data Buffer, Protocol Controller, USB RX, and USB TX that consist of the submodules for the SoC top-level module

QUEVIHN | Biomedical Robot

West Lafayette, IN

Purdue IEEE Computer Society *Nov. 2017 - Jan. 2018*

- QUEVIHN is a Biomedical Robot that utilizes several sensors (Interfaced using an STM32F0DISCOVERY board) and deep learning classification algorithms to accurately diagnose a disease ailing a patient
- Lead a team of IEEE members that enabled the data collected from the robot’s frontend and hardware to communicate with the backend servers

Relevant Coursework

ECE 496 Deep Learning and Neural Networks
ECE 404 Computer Security
ECE 368 Data Structures and Algorithms
ECE 362 Microprocessor Systems and Interfacing
ECE 337 ASIC Design Laboratory
ECE 296 Deep Learning for Wireless Communications
ECE 295 Introduction to Data Science

Certifications

Machine Learning

Stanford University

Coursera [LINK] *Sep. 2017*

Introduction to Python

IBM

Cognitive Class [LINK] *May. 2017*