

# Sharan Ramjee

MASTER'S STUDENT AT STANFORD UNIVERSITY

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## Education

### Stanford University

MASTER OF SCIENCE IN COMPUTER SCIENCE (CONCENTRATION: ARTIFICIAL INTELLIGENCE)

Stanford, CA

Sep. 2020 - Exp. May. 2022

- Department of Computer Science

### Purdue University

BACHELOR OF SCIENCE IN COMPUTER ENGINEERING

West Lafayette, IN

Aug. 2016 - May. 2020

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

## Industry Experience

### Google

SOFTWARE ENGINEERING INTERN

Seattle, WA

Sep. 2019 - Dec. 2019

- Worked with the Google Cloud AI team on using Model Distillation to create Explainable AI by generating rules that explain Deep Learning models
- Created a system to tune the complexity of rules generated, number of rules generated, and accuracy of the Deep Learning model
- Implemented Soft Decision Trees, Random Forests, and Gradient Boosted Decision Trees to compare their trade-offs for Model Distillation

### Qualcomm

MACHINE LEARNING INTERN

San Diego, CA

May. 2019 - Aug. 2019

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

### Publicis Groupe

DATA SCIENCE INTERN

Bengaluru, India

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

## Research Experience

Google Scholar: [\[LINK\]](#) | Research Interests: Computer Vision, Artificial Intelligence, Signal Processing

### DARPA SC2 Research

RESEARCH ASSISTANT

West Lafayette, IN

May. 2018 - May. 2020

- Researcher at the Purdue DARPA SC2 Research Team (BAM!) in collaboration with Texas A&M
- 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

### Summer Undergraduate Research Fellowship

RESEARCH FELLOW

West Lafayette, IN

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 training for Wireless Signal Modulation Classification using Deep Neural Networks with Prof. Aly El Gamal
- Currently hold the record for the highest classification accuracy (99%) with the RML dataset (previous record – 93%)

## Publications

### ACCEPTED/PUBLISHED

[J2] Xingchen Wang, Shengtai Ju, Xiwen Zhang, **Sharan Ramjee**, Aly El Gamal. "Efficient Training of Deep Classifiers for Wireless Source Identification using Test SNR Estimates". IEEE Wireless Communication Letters (**WCL**), Apr. 2020 [\[LINK\]](#)

[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**), Jul. 2019 [\[LINK\]](#)

[J1] **Sharan Ramjee**, Shengtai Ju, Diyu Yang, Xiaoyu Liu, Aly El Gamal, Yonina C. Eldar. "Fast Deep Learning for Automatic Modulation Classification". IEEE Machine Learning for Communications Emerging Technologies Initiatives (**MLCETI**), Jan. 2019 [\[LINK\]](#)

## UNDER REVIEW

[J4] **Sharan Ramjee**, Aly El Gamal. "Efficient Wrapper Feature Selection using Autoencoder and Model Based Elimination". Submitted to IEEE Letters of the Computer Society (LOCS), May. 2020 [PREPRINT]

[J3] **Sharan Ramjee**, Shengtai Ju, Diyu Yang, Xiaoyu Liu, Aly El Gamal, Yonina C. Eldar. "Ensemble Wrapper Subsampling for Deep Modulation Classification". Submitted to IEEE Transactions on Cognitive Communications and Networking (TCCN), May. 2020 [PREPRINT]

## Talks

### QoS Optimization with ML

QUALCOMM APPLIED MACHINE LEARNING (QAML) SYMPOSIUM 2019 [LINK]

San Diego, CA  
Aug. 2019

### Deep Learning for Interference Identification: Band, Training SNR, and Sample Selection

IEEE SIGNAL PROCESSING ADVANCES IN WIRELESS COMMUNICATIONS (SPAWC) 2019 [LINK]

Cannes, France  
Jul. 2019

### Deep Neural Network Architectures for Modulation Classification using PCA

THE SUMMER UNDERGRADUATE RESEARCH FELLOWSHIP (SURF) SYMPOSIUM [LINK]

West Lafayette, IN  
Aug. 2018

### A PyTorch Framework for Automatic Modulation Classification

THE SUMMER UNDERGRADUATE RESEARCH FELLOWSHIP (SURF) SYMPOSIUM [LINK]

West Lafayette, IN  
Aug. 2018

### An Introduction to Deep Learning for Style Transfer

PURDUE IEEE COMPUTER SOCIETY (CSOCIETY) SYMPOSIUM 2018 [LINK]

West Lafayette, IN  
Jan. 2018

## Peer Reviews

TCCN20, IEEE Transactions on Cognitive Communications and Networking

Jun. 2020

WCL2020, IEEE Wireless Communication Letters

May. 2020

TCCN20, IEEE Transactions on Cognitive Communications and Networking

Apr. 2020

TCOM19, IEEE Transactions on Communications

Feb. 2020

WCL2019, IEEE Wireless Communication Letters

Jan. 2020

CL2019, IEEE Communication Letters

Nov. 2019

SPAWC19, IEEE Signal Processing Advances in Wireless Communications

Jul. 2019

## Open Source Contributions

### TensorFlow

GOOGLE SUMMER OF CODE DEVELOPER

Remote

May. 2020 - Present

- Working on implementing key research data in TensorFlow Datasets (TFDS)

### OpenMRS

GOOGLE CODE-IN DEVELOPER

Remote

Dec. 2014 - Feb. 2015

- Worked on detecting, documenting, and fixing bugs on the Open Medical Record System (OpenMRS) interface

## Activities

### Purdue IEEE Computer Society (CSociety)

West Lafayette, IN

PRESIDENT [LINK]

Aug. 2017 - Aug. 2019

- 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 - Aug. 2019

- 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 - Aug. 2019

- 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

## Skills

<b>Languages</b>	Python, C, C++, Java, Shell Scripting, MATLAB
<b>Hardware</b>	System Verilog, Embedded C, Assembly, LTspice
<b>Libraries</b>	TensorFlow, PyTorch, OpenCV, XGBoost, scikit-learn
<b>Other</b>	Git, $\LaTeX$
<b>OS</b>	Android, Linux, ROS

## Projects

### Cov2GenX | Healthcare ML App

Stanford, CA

STANFORD AIMI-HIAE COVID-19 RESEARCHATHON 2020 [\[LINK\]](#)

Jun. 2020

- Cov2GenX is a Machine Learning pipeline for predicting mutation-resistant peptide candidates for COVID-19 vaccines
- Trained Gradient Boosted Decision Trees written in Python using XGBoost to generate a mutation-aware vaccine suite
- Awarded an honorable mention for curating a robust dataset of HLA-specific peptide data with over 347 million examples

### 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
- Written in Java and XML for Android with ML merger prediction and sentiment analysis algorithms written in Python
- Won the “Wolfram Alpha Award” sponsored by Wolfram Alpha and the “Best Payment Solution” award sponsored by Authorize.net

### 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

## Honors & Awards

**Honorable Mention**, Stanford AIMI-HIAE COVID-19 Researchathon

Jun. 2020

**Graduation with Highest Distinction**, Purdue University

May. 2020

**Ideas and Innovation Tournament (I<sup>2</sup>TC) Qualifier**, Purdue University

Feb. 2020

**Eta Kappa Nu (Beta Chapter) Outstanding Junior Scholarship**, Purdue University

2019-2020

**Eli Shay Scholarship**, (3 times) Purdue University

2017-2020

**Dean's List**, (8 times) Purdue University

2016-2020

**Wolfram Alpha Award**, MadHacks (University of Wisconsin-Madison)

Nov. 2018

**Engineering Design Excellence Award**, Purdue University

Dec. 2016

**12<sup>th</sup> Board Exam Scholarship**, DRDO

May. 2016

**10<sup>th</sup> Board Exam Scholarship**, DRDO

May. 2014

## Teaching Assistantships

**Microprocessor Systems and Interfacing**

ECE 362 - PURDUE UNIVERSITY

West Lafayette, IN

Spring 2019

**ASIC Design Laboratory**

ECE 337 - PURDUE UNIVERSITY

West Lafayette, IN

Spring 2019

**Advanced C Programming**

ECE 264 - PURDUE UNIVERSITY

West Lafayette, IN

Spring 2019

**Electronic Measurement Techniques**

ECE 207 - PURDUE UNIVERSITY

West Lafayette, IN

Fall 2018

**Programming Applications For Engineers**

CS 159 - PURDUE UNIVERSITY

West Lafayette, IN

Spring 2018

## Relevant Coursework

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- ECE 496** Deep Learning and Neural Networks
- ECE 469** Operating Systems Engineering
- 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

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### Machine Learning

COURSERA [\[LINK\]](#)

*Stanford University*

*Sep. 2017*

### Python

COGNITIVE CLASS [\[LINK\]](#)

*IBM*

*May, 2017*