Sharan **Ramjee**

MASTER'S STUDENT AT STANFORD UNIVERSITY

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Education

Stanford University   *Stanford, CA*

MASTER OF SCIENCE IN COMPUTER SCIENCE (CONCENTRATION: ARTIFICIAL INTELLIGENCE)   *Sep. 2020 - Jun. 2022*

• GPA: 4.04/4.00

Purdue University   *West Lafayette, IN*

BACHELOR OF SCIENCE IN COMPUTER ENGINEERING   *Aug. 2016 - May. 2020*

• Graduated with Highest Distinction; GPA: 4.00/4.00

Industry Experience

Stripe   *San Francisco, CA*

MACHINE LEARNING ENGINEER   *Jul. 2022 - Present*

• Working with the Fraud Discovery Team (Accounts Identity and Risk Engineering Org) on developing ML models for merchant fraud discovery

Palo Alto Networks   *Stanford, CA*

PRODUCT MANAGER   *Sep. 2021 - Nov. 2021*

• Worked as a Product Manager at Palo Alto Networks for EE 205: Product Management for Electrical and Computer Scientists
• Delivered a Product Opportunity Assessment (POA) and Minimum Viable Product (MVP) for CAASM (Cyber Asset Attack Surface Mgmt.) products
• Won the award for best Product Opportunity Assessment (POA) as a part of EE 205

Stripe   *San Francisco, CA*

SOFTWARE ENGINEERING INTERN   *Jun. 2021 - Sep. 2021*

• Worked with the Fraud Intelligence team (Merchant Intelligence Engineering Org) on using ML models for detecting fraudulent merchants
• Deployed model interpretability methods (LIME, SHAP, etc) to investigate false positive and negative predictions made by the models
• Explored various feature encoding methods for numerical, categorical, and boolean features to gauge trade-offs and improve model performance

Google   *Seattle, WA*

SOFTWARE ENGINEERING INTERN   *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   *San Diego, CA*

MACHINE LEARNING INTERN   *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   *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

Research Experience

Google Scholar: [LINK] | Research Interests: Computer Vision, Natural Language Processing, Signal Processing

Stanford Vision and Learning Lab   *Stanford, CA*

GRADUATE RESEARCHER   *Sep. 2020 - Jan. 2021*

• Worked on robot learning for intuitive human-robot interaction using Computer Vision at the Stanford Vision and Learning Lab (SVL)
• Researched improvements in human-robot interaction performance obtained using parallelized learning and generated mesh grids for parallel Reinforcement Learning on Gibson using Blender

Massachusetts Institute of Technology *Boston, MA*

RESEARCH ASSISTANT *Jul. 2020 - Aug. 2020*

- Worked on bridging the gap between human intelligence and machine intelligence at the MIT Center for Brains, Minds, and Machines (CBMM)
- Researched the synergy between Computer Vision and Physiological Optics with a focus on low-level vision, binocular vision, accommodation, and vision modeling based on how human vision is interpreted by our brains

Purdue University DARPA SC2 Research *West Lafayette, IN*

RESEARCH ASSISTANT *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

Purdue University Summer Undergraduate Research Fellowship *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 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%)

Teaching Assistantships

Artificial Intelligence *Stanford, CA*
CS 221 - STANFORD UNIVERSITY *Spring 2022*

Web Applications *Stanford, CA*
CS 142 - STANFORD UNIVERSITY *Winter 2022*

Deep Learning *Stanford, CA*
CS 230 [Head TA] - STANFORD UNIVERSITY *Fall 2021*

Computer Organization & Systems *Stanford, CA*
CS 107 - STANFORD UNIVERSITY *Spring 2021*

Microprocessor Systems and Interfacing *West Lafayette, IN*
ECE 362 - PURDUE UNIVERSITY *Spring 2019*

ASIC Design Laboratory *West Lafayette, IN*
ECE 337 - PURDUE UNIVERSITY *Spring 2019*

Advanced C Programming *West Lafayette, IN*
ECE 264 - PURDUE UNIVERSITY *Spring 2019*

Electronic Measurement Techniques *West Lafayette, IN*
ECE 207 - PURDUE UNIVERSITY *Fall 2018*

Programming Applications For Engineers *West Lafayette, IN*
CS 159 - PURDUE UNIVERSITY *Spring 2018*

Publications

ACCEPTED/PUBLISHED

[$J3$] **Sharan Ramjee**, Shengtai Ju, Diyu Yang, Xiaoyu Liu, Aly El Gamal, Yonina C. Eldar. "Ensemble Wrapper Subsampling for Deep Modulation Classification". IEEE Transactions on Cognitive Communications and Networking **(TCCN)**, Aug. 2021 [LINK]

[$J2$] 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 Seyfi, 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]

Talks

RESEARCH TALKS

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

OTHER TALKS

Attention-Weighted Integrated Gradients for Target-Aware Cyberbullying Detection
STANFORD UNIVERSITY CS 329T: TRUSTWORTHY MACHINE LEARNING [LINK]
Stanford, CA
Jun. 2022

An ML Driven Analysis of Private Equity Funding in Seed-Stage Healthcare Startups
STANFORD UNIVERSITY GENE225: HEALTHCARE VENTURE CAPITAL [LINK]
Stanford, CA
Jun. 2022

AutoChef: Computer Vision for Automated Ingredient-to-Recipe Matching
STANFORD UNIVERSITY CS 329S: MACHINE LEARNING SYSTEMS DESIGN [LINK]
Stanford, CA
Mar. 2022

FLITE: Focusing LITE for Memory-Efficient Meta Learning
STANFORD UNIVERSITY CS 330: DEEP MULTI-TASK AND META LEARNING [LINK]
Stanford, CA
Dec. 2021

Project Aerial: CAASM for Palo Alto Networks
STANFORD UNIVERSITY EE 205: PRODUCT MANAGEMENT FOR ELECTRICAL ENGINEERS AND COMPUTER SCIENTISTS [LINK]
Stanford, CA
Dec. 2021

Context-Aware Action Recognition via Spatial and Temporal Transformer Networks
STANFORD UNIVERSITY CS 231N: CONVOLUTIONAL NEURAL NETWORKS FOR VISUAL RECOGNITION [LINK]
Stanford, CA
Jun. 2021

Unsupervised Neural Network Models of the Ventral Visual Stream
STANFORD UNIVERSITY CS 431: HIGH-LEVEL VISION: FROM NEURONS TO DEEP NEURAL NETWORKS [LINK]
Stanford, CA
Mar. 2021

Single-Image Stereo Depth Estimation using GANs
STANFORD UNIVERSITY CS 231A: COMPUTER VISION, FROM 3D RECONSTRUCTION TO RECOGNITION [LINK]
Stanford, CA
Mar. 2021

Super-Resolution of Low-Quality Images for Realtime Pothole Detection
STANFORD UNIVERSITY CS 230: DEEP LEARNING [LINK]
Stanford, CA
Nov. 2020

Model Distillation
GOOGLE CLOUD AI [LINK]
Seattle, WA
Dec. 2019

QoS Optimization with ML
QUALCOMM MACHINE LEARNING ANALYSIS [LINK]
San Diego, CA
Aug. 2019

Activities

Stanford TreeHacks
Stanford, CA
TECH FELLOW [LINK]
Jun. 2021 - Jun. 2022
- Worked on adding documentation to and building the TreeHacks websites using JSDoc and JavaScript
- Worked on improving the Stanford TreeHacks Hackathon experience as a part of the TreeHacks tech team

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 onboarding 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

Honors & Awards

Best Product Opportunity Assessment (POA) Presentation, Stanford EE 205: Product Management   *Nov. 2021*
Tech Fellowship, Stanford TreeHacks   *Jun. 2021*
Honorable Mention, Stanford AIMI-HIAE COVID-19 Researchathon   *Jun. 2020*
Graduation with Highest Distinction, Purdue University   *May. 2020*
Ideas and Innovation Tournament (I^{2}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*
12th Board Exam Scholarship, DRDO   *May. 2016*
10th Board Exam Scholarship, DRDO   *May. 2014*

Skills

Languages Python, C, C++, Java, JavaScript, Solidity, Shell Scripting, MATLAB
Hardware System Verilog, Embedded C, Assembly, LTspice
Libraries PyTorch, TensorFlow, Transformers, OpenCV, XGBoost, scikit-learn
Other Git, LaTeX
OS Android, Linux, ROS

Open Source Contributions

TensorFlow   *Remote*
Google Summer of Code Developer   *May. 2020 - Aug. 2020*
- Worked on implementing key research data in TensorFlow Datasets (TFDS)

OpenMRS   *Remote*
Google Code-In Developer   *Dec. 2014 - Feb. 2015*
- Worked on detecting, documenting, and fixing bugs on the Open Medical Record System (OpenMRS) interface

Certifications

Adventures in Design Thinking: A d.school Experience   *Stanford*
Stanford Graduate Summer Institute   *Sep. 2021*
Deep Learning Specialization   *DeepLearning.AI*
Coursera [LINK]   *Dec. 2020*
Machine Learning   *Stanford University*
Coursera [LINK]   *Sep. 2017*

Peer Reviews

IEEE CL, IEEE Communication Letters   *2019-2021*
IEEE WCL, IEEE Wireless Communication Letters   *2019-2021*
IEEE TCCN, IEEE Transactions on Cognitive Communications and Networking   *2020-2021*
NCC, National Conference on Communications   *2021*
CVPR, Conference on Computer Vision and Pattern Recognition   *2021*
IEEE GC, IEEE GLOBECOM 2020 Workshop on Edge Learning over 5G Networks and Beyond   *2020*
IEEE 5GWF, IEEE 3rd 5G World Forum   *2020*
IEEE TCOM, IEEE Transactions on Communications   *2019*
IEEE SPAWC, IEEE Signal Processing Advances in Wireless Communications   *2019*

Relevant Coursework

STANFORD UNIVERSITY

CS 329T	Trustworthy Machine Learning
GENE 225	Healthcare Venture Capital
DESINST 215	The Design of Data
MS&E 472	Entrepreneurial Thought Leaders' Seminar
CS 329S	Machine Learning Systems Design
CS 259Q	Quantum Computing
CS 246	Mining Massive Data Sets
CS 522	Seminar in Artificial Intelligence in Healthcare
CS 330	Deep Multi-Task and Meta Learning
CS 251	Cryptocurrencies and Blockchain Technologies
EE 205	Product Management for Electrical Engineers and Computer Scientists
CS 523	Research Seminar in Computer Vision and Healthcare
CS 361	Engineering Design Optimization
CS 231N	Convolutional Neural Networks for Visual Recognition
CS 142	Web Applications
CS 431	High-level Vision: From Neurons to Deep Neural Networks
CS 231A	Computer Vision, From 3D Reconstruction to Recognition
CS 224W	Machine Learning with Graphs
CS 224N	Natural Language Processing with Deep Learning
CS 300	Departmental Lecture Series
CS 230	Deep Learning
CS 229	Machine Learning
CS 221	Artificial Intelligence: Principles and Techniques

PURDUE UNIVERSITY

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

Projects

Attention-Weighted Integrated Gradients for Target-Aware Cyberbullying Detection *Stanford, CA*

CS 329T: TRUSTWORTHY MACHINE LEARNING [LINK] *Jun. 2022*
- The self-attention layer of transformer models are combined with Integrated Gradients for more robust and fair cyberbullying detection

An ML Driven Analysis of Private Equity Funding in Seed-Stage Healthcare Startups *Stanford, CA*

GENE 225: HEALTHCARE VENTURE CAPITAL [LINK] *Jun. 2022*
- SHAP is applied on an ML model to gain insights on factors driving private equity investment decisions in healthcare startups

AutoChef: Computer Vision for Automated Ingredient-to-Recipe Matching *Stanford, CA*

CS 329S: MACHINE LEARNING SYSTEMS DESIGN [LINK] *Mar. 2022*
- AutoChef is a web app that uses an object detection model for automated ingredient-to-recipe matching using a single picture of your ingredients

FLITE: Focusing LITE for Memory-Efficient Meta Learning *Stanford, CA*

CS 330: DEEP MULTI-TASK AND META LEARNING [LINK] *Dec. 2021*
- FLITE is a meta learning wrapper that uses heuristics for gradient estimation during meta training for fast and memory-efficient learning

AdaLA: Adapting Gradient Estimation by Looking Ahead

Stanford, CA

CS 361: ENGINEERING DESIGN OPTIMIZATION [LINK]   *Jun. 2021*

- AdaLA is an ML optimizer that modifies AdaBelief by using a "look-ahead" strategy to adaptively estimate step sizes to take during gradient descent

Context-Aware Skeleton Action Recognition via Spatial and Temporal Transformer Networks

Stanford, CA

CS 231N: CONVOLUTIONAL NEURAL NETWORKS FOR VISUAL RECOGNITION [LINK]   *Jun. 2021*

- The Spatial-Temporal Context-aware Transformer Network (ST-CTR) uses graph learning on pose skeletons for improved action recognition

Single-Image Stereo Depth Estimation using GANs

Stanford, CA

CS 231A: COMPUTER VISION, FROM 3D RECONSTRUCTION TO RECOGNITION [LINK]   *Mar. 2021*

- The single-image stero depth estimation pipeline uses two GANs in sequence to generate a stereo image counterpart for depth estimation

Histogram Gradient Boosting Trees for Graph Learning with Wasserstein Embeddings

Stanford, CA

CS 224W: MACHINE LEARNING WITH GRAPHS [LINK]   *Mar. 2021*

- HGBTs are used to predict HIV-inhibiting properties in molecules through graph learning by embedding them in a Wasserstein space

Aspect-Target Sentiment Classification for Cyberbullying Detection

Stanford, CA

CS 224N: NATURAL LANGUAGE PROCESSING WITH DEEP LEARNING [LINK]   *Mar. 2021*

- Aspect-Target Sentiment Classification uses BERT to perform sentiment classification with respect to a target for cyberbullying detection

Super-Resolution of Low-Quality Dashcam Images for Realtime Pothole Detection

Stanford, CA

CS 230: DEEP LEARNING [LINK]   *Nov. 2020*

- Super-Resolution GANs are used to address the domain mismatch issue in low-quality dashcams for improved real-time pothole detection

Image Data Augmentation for Plant Leaf Disease Classification Using Neural Style Transfer

Stanford, CA

CS 229: MACHINE LEARNING [LINK]   *Nov. 2020*

- Neural Style Transfer is used to detect new diseases in new plant species through data augmentation by transferring old diseases to new plants