Vineet R. Shenoy

Contact Information

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U.S. Citizen

Objective

I am searching for full-time opportunities in machine learning and computer vision, with a focus on hardware-aware algorithmic design. My dissertation and professional work focused on facial video-based vital signs estimation with generative modeling in laboratory and clinical settings, which has given me solid foundations in signal recovery, optimization, and imaging. I am excited to build and implement AI and ML algorithms—particularly those related to generative modeling, LLMs, and agentic AI—in real-world environments to help customers solve their difficult challenges.

Education

Johns Hopkins University **Aug 2020 - Present**
PhD., Electrical and Computer Engineering
Advisor: Dr. Rama Chellappa

Johns Hopkins University **December 2024**
M.S.E, Electrical and Computer Engineering
Advisor: Dr. Rama Chellappa

Rutgers University - New Brunswick **August 2014 - May 2018**
B.S., Electrical and Computer Engineering, Computer Science
Summa Cum Laude

Relevant Coursework

- Statistical Theory
- Machine Perception
- Statistical Pattern Recognition
- Advanced Digital Signal Processing
- Information Theory
- Estimation and Detection Theory
- Convex Optimization
- Stochastic and Random Processes

Skills

Languages : Python, C, Java
Softwares : Pytorch, Tensorflow, OpenCV, Matlab, Docker
Operating System : Windows, Linux

Professional and Academic Experience

Mitsubishi Electric Research Labs
Research Intern – Remote Vital Signs Estimation **July 2022 - December 2022, May 2024-August 2024**

- Designed two state-of-the-art deep learning algorithms for heart-rate estimation at-a-distance using facial videos, reducing error by over 14%. Publication at ICIP 2023 and IEEE Transactions on Image Processing (under review).
- Designed and built data collection set-up for blood pressure estimation from facial videos. Identified equipment to procure, including high frame-rate camera, lighting, and blood pressure sensor.

Johns Hopkins University
Research Assistant **January 2020 - Present**

- Improved baseline deep learning object detector by 9 points to achieve state-of-the-art performance on operational traffic camera data using domain adaptation techniques.
- Integrated the detector along with a multi-target, multi-camera camera tracking system that re-identifies vehicles in different cameras.

- Collaborated with professional software engineers to integrate research into a real-time, multi-target multi-camera tracking system for the National Geospatial-Intelligence Agency (NGA).
- Built diffusion/generative models for remote vital signs estimation, and conducted a detailed uncertainty analysis of the models. Paper under review at Transactions on Machine Learning Research (TMLR).

Blutag

Software Engineer **August 2018 - August 2019**

- Integrated a recommendation system using LightFM (Python) into ElasticSearch for efficient searching of products.
- Generated classification labels for unknown products using PyTorch. Achieved 95% accuracy after 20 epochs of training.
- Built workflow for product classification using PyTorch, from image download, data cleaning, and preparation to training and model deployment as a web service using Microsoft Azure.

Patents

Deep equilibrium model based systems and methods for estimating vital signs
Lohit, S., **Shenoy, V.**, Mansour, H., Marks, T.
U.S. Patent Application No. 18/619,583.

Publications

Uncertainty-quantified Pulse Signal Recovery from Facial Video using Regularized Stochastic Interpolants
Shenoy V., Peng C., Chellappa R., Sun Y.
Submission to Transaction on Machine Learning Research (TMLR)

Perfusion Assessment of Healthy and Injured Hands Using Video-Based Deep Learning Models
Shenoy V., Kingston C., Singh M., Durr N., Chellappa R., Giladi A.
Plastic and Reconstructive Surgery 2025

Recovering Pulse Waves from Video Using Deep Unrolling and Deep Equilibrium Models
Shenoy V., Lohit S., Mansour H., Chellappa R., Marks T
https://arxiv.org/abs/2503.17269 – submission to IEEE Trans. Image Processing

Time-Series U-Net with Recurrence for Noise-Robust Imaging Photoplethysmography
Shenoy V., Wu S., Comas A., Marks T, Lohit S., Mansour H.
https://arxiv.org/abs/2503.17351 – Accepted at IEEE Access

Robust Feature Space Organization with Distillation for Few-Shot Object Detection
Shenoy V., Chellappa, R.
IEEE International Conference on Patern Recognition (ICPR 2024)

Unrolled iPPG: Video Heart Rate Estimation via Unrolling Proximal Gradient Descent
Shenoy V., Marks Tim K., Mansour H., Lohit S.
IEEE International Conference on Image Processing (ICIP 2023)

Robust and Scalable Vehicle Re-Identification via Self-Supervision
Khorramshahi P., **Shenoy V.**, Chellappa R.
Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops 2023

Scalable and Real-Time Multi-Camera Vehicle Detection, Re-Identification, and Tracking
Khorramshahi P., **Shenoy V.**, Pack M., Chellappa R.
Pre-print 2022

Multi-Class, Multi-Movement Vehicle Counting on Traffic Camera Data
Shenoy V., Chellappa R.
Technical Report 2022

Towards real-time systems for vehicle re-identification, multi-camera tracking, and anomaly detection
Peri N., Khorramshahi P., Rambhatla S., **Shenoy V.**, Rawat S., Chen J.C. , Chellappa R.
Conference on Computer Vision and Pattern Recognition Workshops, 2020

Study of Timing Constraints and SAS Overload in the CBRS Band using SAS-CBSD Protocol
Anirudha Sahoo, Naceur El-Ouni, **Vineet Shenoy**
IEEE Globecom Conference Workshops 2019

Assistantship

Teaching Assistant **Aug 2019 - Dec 2019**

Digital Computer Design (UMD ENEE446)

- Lead weekly discussion sessions, assisted students during office hours, and provided feedback through graded assignments

Achievements

- **Rutgers School of Engineering Commencement Speaker**, May 2018
- **Rutgers Chancellor's Leadership Award**, May 2018
- **James Leroy Potter Award for Original Investigation**, May 2018
- **Phi Beta Kappa**, Member, April 2018
- **Tau Beta Pi**, Member, December 2016
- **Valedictorian**, West Windsor-Plainsboro High School North, June 2014
- **Eagle Scout**, September 2013