

CONTACT INFORMATION	3400 North Charles Street Baltimore, Maryland, 21218 <a href="mailto:vshenoy4@jhu.edu">vshenoy4@jhu.edu</a> , <a href="https://vineetrshenoy.github.io/">https://vineetrshenoy.github.io/</a> U.S. Citizen
OBJECTIVE	I am searching for full-time opportunities in machine learning and computer vision. During my PhD I built vehicle detection and tracking algorithms on operational traffic camera data, and delivered a real-time multi-camera tracking software system to the U.S. Government. This work also resulted in top-tier academic conference publications. My current work on health monitoring, in collaboration with Mitsubishi, 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 challenges.
EDUCATION	<b>Johns Hopkins University</b> <span style="float: right;"><b>Aug 2020 - Present</b></span> PhD., Electrical and Computer Engineering Advisor: Dr. Rama Chellappa <b>Johns Hopkins University</b> <span style="float: right;"><b>December 2024</b></span> M.S.E, Electrical and Computer Engineering Advisor: Dr. Rama Chellappa <b>Rutgers University - New Brunswick</b> <span style="float: right;"><b>August 2014 - May 2018</b></span> B.S., Electrical and Computer Engineering, Computer Science <i>Summa Cum Laude</i>
SKILLS	<b>Languages</b> : Python, C, Java <b>Softwares</b> : Pytorch, Tensorflow, OpenCV, Matlab, Docker/Singularity, Git <b>Operating System</b> : Linux, Windows
PATENTS	<b>Deep equilibrium model based systems and methods for estimating vital signs</b> Lohit, S., <b>Shenoy, V.</b> , Mansour, H., Marks, T. <i>U.S. Patent Application No. 18/619,583.</i> <b>System and Method for Pulse Signal Recovery from Facial Video</b> <b>Shenoy, V.</b> , Peng C., Chellappa R., Sun Y. <i>U.S. Provisional Application No. 63/884,663.</i>
PROFESSIONAL AND ACADEMIC EXPERIENCE	<b>Johns Hopkins University</b> <span style="float: right;"><b>January 2020 - Present</b></span> <i>Research Assistant</i> <ul style="list-style-type: none"><li>Improved a baseline deep learning object detector by 9 points to achieve state-of-the-art performance on operational traffic camera data using domain adaptation techniques.</li><li>Integrated the detector along with a multi-target, multi-camera camera tracking system that re-identifies vehicles in different cameras.</li><li>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).</li><li>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).</li></ul> <b>Mitsubishi Electric Research Labs</b> <span style="float: right;"><b>July 2022 -August 2024</b></span> <i>Research Intern – Remote Vital Signs Estimation</i> <ul style="list-style-type: none"><li>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).</li><li>Designed and built data collection set-up for blood pressure estimation from facial videos. Identified equipment to procure, including a high frame-rate camera, lighting, and blood pressure sensor.</li></ul> <b>Blutag</b> <span style="float: right;"><b>August 2018 - August 2019</b></span> <i>Software Engineer</i> <ul style="list-style-type: none"><li>Integrated a recommendation system using LightFM (Python) into Elasticsearch for efficient searching of products.</li></ul>

- 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.

## 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)*

### **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> – *IEEE Trans. Image Processing 2026*

### **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*

### **Time-Series U-Net with Recurrence for Noise-Robust Imaging Photoplethysmography**

Shenoy V., Wu S., Comas A., Marks T, Lohit S., Mansour H.

*IEEE Access 2025*

### **Robust Feature Space Organization with Distillation for Few-Shot Object Detection**

Shenoy V., Chellappa, R.

*IEEE International Conference on Pattern 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.

*Proc. of the IEEE/CVF Conf. 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*

## RELEVANT COURSEWORK

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

## 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