

# Prabhdeep Singh Sethi

Mob: (412) 589-8023 | E-mail: [prabhdes@andrew.cmu.edu](mailto:prabhdes@andrew.cmu.edu) | LinkedIn: [prabhdeep1999](#) | Github: [Prabhdeep1999](#)

## EDUCATION

### Carnegie Mellon University

Pittsburgh, PA

*Master of Science in Computer Vision (GPA: 4/4)*

December 2024

Coursework: Advanced Computer Vision, Introduction to Robot Learning, Multimodal Learning, Learning for 3D Vision

### Government College of Engineering, Nagpur

Nagpur, India

*Bachelor of Engineering in Computer Science (GPA: 9.5/10)*

August 2021

Coursework: Operating Systems, Data Structures & Algorithms, Artificial Intelligence, Databases, Object Oriented Programming

## EXPERIENCE

### Wobot Intelligence

New Delhi, India

*Computer Vision Engineer-II*

02/2022 - 08/2023

- Led a team of 6 to deliver person and vehicle Re-Identification features, serving 1M+ cameras and 10,000+ customers.
- Implemented an attribute-based fuzzy search with custom EfficientNet for local and global feature extraction. Further utilized VAE for dimensionality reduction & designed dynamic cosine similarity thresholds using k-means clustering.
- This approach reduced false IDs by 65% and improved Rank-1 of ReID by 35% in our multi-camera tracking algorithm.
- Achieved 55 HOTA (Higher Order Tracking Accuracy) on MOT17 with custom object tracker, reducing false tickets by 28%. Created Central Tracking Server akin to model-serving architectures for efficient tracking in a scalable setup.
- Undertook development of two internal use cases: Achieved 94%+ accuracy in mapping customer journeys for Customer Dwell Time and maintained 96% accuracy for detecting incorrect door usage in safety-critical areas for Entry-Exit Specific Door.

### Solar Industries India Ltd. (Research and Development Lab)

Nagpur, India

*Senior Computer Vision Researcher*

08/2021 - 01/2022

- Led Smart Blast Project, achieved fume toxicity detection through background subtraction and color clustering.
- Trained a Vision Transformer for object detection of critical military parts for Product Inspection of Multi-Mode Hand Grenade, achieving 96.5% mAP for detecting 9 such parts. Deployed models using Nvidia Triton for enhanced operational efficiency.

*Computer Vision Intern*

01/2020 - 08/2021

- Developed Overspeeding and Automatic Number Plate Recognition solutions using YOLOv4, PaddleOCR for plate extraction, and DeepSORT for real-time tracking and relative speed calculation with a margin of error of 10 m/s.

## PROJECTS

### Safe Reinforcement Learning (Constrained Policy Optimization (CPO))

08/2023 - Current

- Enhanced CPO 3.5% by implementing an actor-critic version of it with GAE and A3C and Hellinger distance instead of KL.

### Multimodal TVQA (Multimodal Fusion) [\[Code\]](#)

09/2023 - Current

- TVQA tasks tend to overutilize language and underutilize vision inputs so currently working on efficient fusion for the same.

### UAV Detection (Small Object Detection, Bird vs. Drone Classification) | [\[Code\]](#)

10/2021 - 12/2021

- Enhanced UAV detection via GAN-based augmentation & tiling of input infrared video streams, achieving 95.1% mAP using TensorRT Quantized YOLOv5s; the solution excelled in Anti-UAV Challenge by ICCV '21, delivering 37 FPS on Jetson TX2.

### Autonomous Drone (Person Tracking & Intruder Detection via UAV) | [\[Code\]](#)

06/2021 - 11/2021

- Designed a perception stack to detect people from autonomous UAV and optimized it for real-time edge processing.
- Led a team of 5 to deliver a 3D person following drone; utilized DJI Tello for live UDP streaming, enabling YOLOv3 to detect individuals and provide coordinates for 3D space. Developed an app for drone control and a website for real-time alerts.

### Image Forgery Detection (Benford's Law, Discrete Cosine Transform (DCT)) | [\[Code\]](#)

05/2021 - 06/2021

- Implemented a multi-step approach to detect copy-move attack, dividing input image to blocks and applying feature extraction using DCT followed by dimensionality reduction through JPEG quantization, with lexicographical sorting to enhance accuracy.

### Researcher at Intelligent Mobility Labs (Class-agnostic object segmentation)

02/2021 - 05/2021

- Enhanced class-agnostic object segmentation for Autonomous Vehicle; improved unknown object detection by 4.5%.
- Achieved the accuracy stated using self-supervised features from the DINO backbone and an adversarial training setup.

## SKILLS

**Languages and Frameworks:** Python, C++, Go, C, Bash, Dart; PyTorch, TensorFlow, OpenCV, Scikit-Learn, Flask, Flutter, React.js

**Tools and Platforms:** Docker, Kubernetes, Triton, DeepStream, TensorRT, AIMET, PostgreSQL, AWS, Azure, GCP