

Prabhdeep Singh Sethi

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Objective: Seeking Computer Vision Internships for Summer 2024

EDUCATION

Carnegie Mellon University

Pittsburgh, PA

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

December 2024

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

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

SKILLS

Languages and Frameworks: Python, C++, Go, C, Bash; PyTorch, TensorFlow, Numpy, OpenCV, Flask

Tools and Platforms: Docker, Git, Triton, HuggingFace, DeepStream, TensorRT, AIMET, SQL, AWS, Azure

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

Sparse view 3D Pose and Reconstruction (Gaussian Splatting, Diffusion)

12/2023 - Current

- Implementing extraction of normals, BRDF and incident light for real-time relighting of the 3D Gaussians.
- Improving 3D reconstruction performance using Gaussian Splatting and Diffusion priors in sparse settings (3-4 views).

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

09/2023 - Current

- Improved contextualization of modalities in Social-IQ 2.0 dataset by 5.04% and achieved SOTA results of 80.34% accuracy in answering socially intelligent questions by introducing CLIP based contextualization and novel speaking turn frame sampling.
- Designing fusion methodology to improve alignment of vision and language in TVQA tasks and remove dependencies on QAs.

Safe Multi-Agent RL (Jensen-Shannon (JS) Divergence) | [\[Report\]](#)

09/2023 - 12/2023

- Enhanced MACPO by using JS divergence due to its symmetric nature (Paper under review in ICLR Tiny Track).
- Improved or maintained rewards while reducing cost by an average of 50% in 3 different environments in Safety-Gym.

UAV Detection (Small Object Detection) | [\[Code\]](#)

10/2021 - 12/2021

- Enhanced UAV detection via GAN-based augmentation & tiling of infrared streams, using TensorRT Quantized YOLOv5s.
- The solution excelled in Anti-UAV Challenge by ICCV '21, delivering 37 FPS on Jetson TX2 achieving 95.1% mAP.
- Improved bird vs drone classification by 17% through trajectory analysis of flight pattern classified temporally using XGBoost.

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.