Prabhdeep Singh Sethi

E-mail: prabhdes@andrew.cmu.edu | Website: bit.ly/prab | LinkedIn: prabhdeep1999 | Github: Prabhdeep1999 | Mob: (412) 589-8023

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, 3D Computer Vision, Multimodal Machine Learning, Reinforcement 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, PyTorch3D, 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 6 member team to deliver vehicle and person Re-Identification solutions, serving 1M+ cameras and 10,000+ customers.
- Implemented an attribute-based fuzzy search with modified 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 object tracking algorithm.
- Achieved 55 HOTA (Higher Order Tracking Accuracy) on MOT17 with custom object tracker, reducing false tickets by 28%.
- Achieved 94% accuracy in mapping customer journeys in a retail setup and 96% accuracy for detecting incorrect door usage.

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.
- Designed the pipeline for Product Inspection of critical military parts by using a Vision Transformer (ViT) for object detection, 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, 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
Advisor: Dr Shubham Tulsiani
- 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 Video Question Answering (Multimodal Fusion) | [Code] [Poster] — 09/2023 - Current
Advisor: Dr Louis-Philippe Morency
- 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 VQA tasks and remove dependencies on QAs.

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.

PUBLICATIONS

ICLR 2024, Tiny Paper Track, *"Jensen-Shannon Divergence in Safe Multi-Agent RL"* (Under review - Positive rebuttal) [Report]