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Top Skills

ONNX
DeepStream
Linear Algebra

Certifications

6.00.1x: Introduction to Computer
Science and
Programming Using Python

Honors-Awards

TEDx Speaker

Publications

A Novel Application of Multiscale
Low-Rank Image Decomposition for
Optic Disc Localization

Smart City Traffic Intersection:
Impact of Video Quality and Scene
Complexity on Precision and
Inference

Dwiref Oza

Computer Vision | Deep Learning | CUDA/TensorRT
Santa Clara, California, United States

Summary

MS grad from Columbia University with a passion for applied Deep Learning and Computer Vision. I have a strong background rooted in signal processing, with 2 years of research experience in both applied health and object detection+tracking. Currently employed at Path Robotics as a CV Engineer.

Experience

Path Robotics
Computer Vision Engineer
February 2022 - January 2024 (2 years)
Columbus, Ohio, United States

At Path, I worked in the Perception and Adaptive Welding teams.

For the Perception team, I co-developed and maintained a dynamic point cloud stitching algorithm package for Path's Part Identification stack.

With the Adaptive Welding team, I worked with weld engineers and material science experts to develop and improve the weld optimization, weld strategy, and weld target identification pipelines.

A couple of my major projects included:

- Led a refactor and consolidation of version 1 of Path's adaptive welding software. This simplified engineering support overhead by eliminating divergences across multiple customers.
- Developed a novel weld quality prediction model designed to seed the weld optimization pipeline with viable candidate weld patterns. This model helped reduce optimization time by up to 60%. This solution cut the idle time between identification and arc welding by as much as 45 minutes - drastically increasing the throughput of deployed weld cells.

Streamn, Inc.
Applied Machine Learning Engineer
May 2021 - February 2022 (10 months)

Cupertino, California, United States

As the Applied ML Engineer at Streamn, it was my job to develop & maintain ad detection methods from video streams . Key skills I exercised in this position included signal processing, computer vision, and machine learning.

Columbia University in the City of New York

Graduate Research And Teaching Assistant

June 2020 - December 2020 (7 months)

New York, New York, United States

I worked as an RA with Prof. Zoran Kostic over two consecutive terms - Summer and Fall of 2020. My projects during this time dealt with object detection for pedestrians and vehicles at traffic intersections, enabled by the COSMOS testbed (<https://www.cosmos-lab.org/>).

1. Profiling and Deploying Mask R-CNN with TensorRT and Nvidia DeepStream (Summer 2020).

- Performed intensive CUDA profiling of the MRCNN model, documented a short guide on profiling with Nvidia Visual Profiler/NVVP for in-lab reference.
- Explored viability of popular Tensorflow and PyTorch implementations of the Mask R-CNN for DeepStream integration.

2. Multi-Resolution and Density Study for Object Detection using YOLOv4 (Fall 2020)

- Performed a comprehensive study on the variations in average precision and mAP for pedestrian and vehicle detection with YOLOv4 on the COSMOS traffic intersection dataset for different video resolutions and for different object densities. Also compared the compute times for each case using CUDA profiling.

Indian Institute of Science (IISc)

Project Assistant

May 2018 - June 2019 (1 year 2 months)

Bangalore

Employer at IISc - Spectrum Lab, Department of Electrical Engineering.

PI - Dr. Chandra Sekhar Seelamantula

Over 12 months, I worked on various image processing and deep learning-assisted biomedical segmentation problems for retinal pathologies, in addition to mentoring summer and winter interns at the lab. Lab members often

engaged in speaking at internal seminars to discuss interesting topics or their own research work. I gained experience in presenting mathematical and technical ideas to a qualified audience.

My projects included -

1. Lesion segmentation for Diabetic retinopathy using a U-Net

- Explored several wavelet, gradient, and intensity-based image preprocessing methods for the image dataset.

2. Grading Macular edema severity with Fovea detection and lesion segmentation

- by identifying the distance of lesions from the fovea (a retinal dead-zone visible as a dark trough on an image of the retina), the severity of macular degeneration can be determined over 3 levels.

- This was achieved by combining the U-Net project for lesion segmentation with key-point detection to pinpoint the fovea.

ΛΔQ: The Literary, Debate and Quiz Club of MIT, Manipal

Head of Public Speaking, Debate and Poetry

September 2016 - November 2017 (1 year 3 months)

Manipal

Co-ordinated the organization of university level debates and intra and inter-collegiate literary events. Conducted workshops on Parliamentary debating & adjudication, public speaking, creative writing, slam poetry and quizzing.

Automation & Control Systems Pune

Intern

May 2017 - May 2017 (1 month)

Pune Area, India

Developed a familiarity with Allen Bradley and Mitsubishi PLCs and the relevant programming methods. Also received training in SCADA and DCS, and had the opportunity to go hands on with an ABB industrial robot.

Electronica Mechatronic Systems India Pvt. Ltd

Intern

May 2016 - June 2016 (2 months)

Pune Area, India

Interned at the R&D department of EMS; received exposure to CNCs and EMC practices in manufacturing; gained knowledge of measurement systems by

attempting to reverse engineer existing company products. Primary focus - Encoder design, Verilog and Embedded C programming.

Education

Columbia University in the City of New York

Master's degree, Electrical and Electronics Engineering · (2019 - 2020)

Manipal Institute of Technology

Bachelor of Technology, Electrical and Electronics Engineering · (2014 - 2018)

D.A.V. Public School, Pune

· (2004 - 2014)