PRERIT JAISWAL

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TRAINING / COURSES

Udacity Self-driving Car Nanodegree (2018)

Implemented models for traffic light detection and classification, path planning and control in an actual self-driving car.

Udacity Deep Learning and Machine Learning Nanodegree (2017)

SVM, decision trees, Reinforcement learning, Seq2Seq models, GANs

Postdoc

Brown University (2015-2017): Built theoretical models and performed simulations to identify ML strategies for discovering these models at collider experiments.

ACHIEVEMENTS

Didi Chuxing Self-Driving Car Challenge

Implemented neural network for real- time vehicle and pedestrian 3D detection, by using camera, LiDAR and radar data. Placed 8th out of 2,000+ registered teams.

Particle physics research

Over 15 publications in top journals of particle physics with 1000+ citations. Resolved a long-standing anomaly in the field.

SKILLS

Programming Languages

Python C++ Rust

WebGL

Libraries

Tensorflow PyTorch

OpenCV Scikit-learn

Pandas

EXPERIENCE

Sr. Applied Scientist

AWS, Chime SDK 2022 - Present SF Bay Area, CA

Amazon Chime SDK lets builders add real-time voice, video, and messaging powered by machine learning into their applications.

- Built new ML based features for video conferencing such as face relighting and face touch-up / skin smoothing. Trained face segmentation model with limited dataset and designed novel post-processing algorithms for real-time inference.
- Optimized models to run on edge devices such as laptops and mobiles increasing the inference speed by as much as 2x.
- Implemented algorithms for background blur, skin smoothing and look-up tables in WebGL to further reduce run-time in the browsers by up to 50%.
- Conducted Mean Opinion Scoring studies to evaluate the model performance and to identify any biases.

Sr. Machine Learning Engineer

DeepMap (acquired by NVIDIA) 2021 - 2021 SF Bay Area, CA

DeepMap (now part of NVIDIA) builds HD maps for self-driving cars.

- Integrated traffic sign detection and classification models in pipeline for building HD maps for autonomous vehicles. Sensor fusion with LiDAR point cloud was used to get robust predictions.

Sr. Machine Learning Engineer

Standard AI 2019 - 2021 San Francisco, CA

Standard AI (formerly Standard Cognition) builds technology behind autonomous stores / cashier-less checkouts.

- Prototyped several deep learning models in Tensorflow and PyTorch. This includes multi-person human pose estimation including uncertainty estimates, transformer based action recognition and 2D-to-3D pose lifting for real-time shopper tracking and event detection in cashierless checkout technology.
- Built pipeline for 3D reconstruction of shelves in the store using both classical methods such as SfM and SIFT as well deep models for multi-view reconstruction.
- Built pipelines for data ingestion with data version control and created training dataflows with augmentation stacks.
- Performed optimizations for real-time inference such as writing post-processing in cython/Rust and running TensorRT optimization on models for inference on edge device.
- Implemented computer vision algorithms for 3D triangulation and camera projection in Rust (faster than OpenCV implementation).
- Designed efficient deep model for semantic change detection of skus on shelves. Generated synthetic dataset for training in Blender through python scripting.
- Implemented several real-time algorithms for assisting humans in the loop.
- Built metrics for ML models that directly pertain to business.

Computer Vision Engineer

AVAretail 2018 - 2018 Redmond, WA

AVAretail builds smart stores for retailers for frictionless experience.

- AI lead for development of cashier-less checkout systems at retail stores using computer vision and deep learning.
- Designed multi-person human pose estimation and shopper re-identification (based on triplet loss) models in TensorFlow for real-time use in embedded devices.
- Implemented object detection model for checkout technology using fully synthetic data.

EDUCATION

PhD, Theoretical Particle Physics

Stony Brook University 2007 - 2012 NY

B. Tech., Engineering Physics

IIT Bombay 2003 - 2007 India