Cody Reading

416-258-5555 | codyreading@gmail.com | http://www.linkedin.com/in/codyreading | https://github.com/codyreading

Skills

Languages:
Python
C++
Bash
MATLAB

Software:
PyTorch
TensorFlow
Keras
Numpy
Kornia
W&B
Sckit-Learn
OpenCV
Matplotlib
Seaborn
Pandas
Slurm
Unittest
Google Test
Eigen
Docker
Singularity
Git
Linux

Concepts:
Computer Vision
Deep Learning
Neural Networks
Generative
Models
Perception
Optimization
Pose Estimation
3D Modeling
3D
Transformations
Projective
Geometry
Voxel Grids
Face Editing
Object Detection
Tracking
Semantic-
Segmentation
Depth Estimation

Publications

In Submission to Winter Conference on Applications of Computer Vision (WACV)   2023
C. Reading, J. Willes, S. L. Waslander.
InterTrack: Interaction Transformer for 3D Multi-Object Tracking

IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Oral Presentation   2021
C. Reading, A. Harakeh, J. Chae, S. L. Waslander.
Catgorical Depth Distribution Network for Monocular 3D Object Detection

IEEE International Conference on Intelligent Transportation Systems (ITSC)   2018
M. Angus, M. ElBalkini, S. Khan, A. Harakeh, O. Andrienko, C. Reading, S. L. Waslander, and K. Czarnecki.
Unlimited Road-scene Synthetic Annotation (URSA) Dataset

Academic Experience

3D Perception Researcher, University of Toronto   2019 - 2021
- Developed a monocular 3D object detection method using PyTorch and Python achieving 1st place on the KITTI and Waymo 3D monocular object detection benchmarks
- Developed a 3D multi-object tracking method using Pytorch and Python achieving 2nd place on the nuScenes 3D multi-object tracking benchmark
- Created Slurm bash scripts to run jobs on a compute clusters to parallerize multiple experiments
- Built an experiment tracking and advanced visualization framework using Weights & Biases and Matplotlib to track model configuration, metrics for independent object classes, and feature visualizations
- Implemented Python unit tests using the Unittest framework to verify functionality and prevent regressions

Semantic Segmentation Research Coop, University of Waterloo   2017
- Trained the SegNet and FCN semantic segmentation methods using Caffe and Python on the Cityscapes, Playing-for-data, and Synthia datasets to obtain experiment results
- Created a custom data layer using Python and OpenCV for SegNet and FCN to allow training of multiple datasets (synthethic and real) with customizable proportions in one training session
- Automated and simplifed the segmentation training procedures adding multi-stage training
- Developed ROS nodelets in C++ with OpenCV to peform segmentation inference and stereo processing

Work Experience

Machine Learning Research Associate, Monsters Aliens Robots Zombies (MARZ)   2022 - Present
- Developing a generative model based face editing method using Pytorch and Python for TV show applications
- Developed a custom data layer using Python and Pandas to support loading of 7 edit types for both original and edited images
- Built a full image editing pipeline involving image cropping, inverse cropping, and data format conversions
- Created evaluator for facial editing supporting multiple metrics including pixel error and perceptual similarity

Software Engineer - Autonomous Driving, NVIDIA Corporation   2018
- Developed a vehicle trajectory generation library within the NVIDIA DriveWorks SDK using C++ to generate a sequence of vehicle poses from GPS, IMU, and CAN sensor data
- Implemented configurable trajectory sampling and continuous pose estimation using interpolation
- Added 3D pose and coordinate transformation functionality using the Eigen C++ library
- Verified functionality of the trajectory generation library using the Google Test framework
- Integrated trajectory generation library into DriveWorks simulation software

Education

M.A.Sc. Aerospace Enigineering, University of Toronto   2019 - 2021
B.A.Sc. Honours Mechatronics Engineering, University of Waterloo   2013 - 2019