

Cody Reading

✉ codyreading@gmail.com | 🌐 codyreading.github.io | 📄 github.com/codyreading | 🔗 linkedin.com/in/codyreading

EXPERIENCE

Senior Researcher

July. 2024 – Present

Huawei Technologies | Python, PyTorch

Markham, ON

- Implemented a 3D scene graph estimation and segmentation technique to enable robotic navigation/manipulation
- Developed a 3D object labeling tool for generating perception labels (6D pose, 2D bounding boxes, and 2D masks) for multiple objects in indoor environments
- Created a custom dataset of 15 different objects and 26 unique configurations with perception labels

Computer Vision Researcher - 3D Generation

Sept. 2023 – April 2024

Simon Fraser University | Python, PyTorch

Burnaby, BC

- Developed a 3D generative method that efficiently optimizes 3D Gaussians following sketch and text descriptions for high-quality geometric and appearance control
- Created a depth extraction method from Stable Diffusion by learning latent space update directions
- Built an image composition method guided by Stable Diffusion to correct foreground/background inconsistencies

Machine Learning Research Associate

Jan. 2022 – Aug. 2023

Monsters Aliens Robots Zombies | Python, PyTorch

Toronto, ON

- Developed a facial de-aging tool Vanity AI designed for VFX applications, reducing manual artist time by 80%
- Built an image editing application with Streamlit involving both AI (with StyleGAN) and classical operations
- Implemented mask tracking for facial regions using a combination of StyleGAN and mesh-based visual alignment
- Worked tightly with VFX artists to receive and integrate daily feedback based on quality and usability

Computer Vision Researcher - 3D Perception

Sept. 2019 – Dec. 2021

University of Toronto | Python, PyTorch

Toronto, ON

- Developed a monocular 3D object detection method achieving 1st place on the KITTI and Waymo benchmarks
- Developed a 3D multi-object tracking method achieving 2nd place on the nuScenes 3D MOT benchmark
- Engineered infrastructure using SLURM, Bash, Python, and W&B to support large-scale experimentation
- 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 unit tests using the Unittest framework to verify functionality and prevent regressions

Software Engineer - Autonomous Driving

Jan. 2018 - Aug. 2018

NVIDIA Corporation | C++

Holmdel, NJ

- Developed a vehicle trajectory generation library within the NVIDIA DriveWorks SDK from multi-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

Semantic Segmentation Research Co-op

May 2017 - Aug. 2017

University of Waterloo | Python, C++, Caffe

Waterloo, ON

- Trained the SegNet and FCN segmentation methods on the Cityscapes, Playing-for-data, and Synthia datasets.
- Created a custom data layer for SegNet and FCN to allow multi-dataset training with customizable proportions
- Automated and simplified the segmentation training procedures by adding multi-stage training.
- Developed ROS nodelets in C++ with OpenCV to perform segmentation inference and stereo processing.

EDUCATION

University of Toronto

Toronto, ON

Master's of Applied Science, Aerospace Engineering

Sept. 2019 – Dec. 2021

University of Waterloo

Waterloo, ON

Bachelor of Applied Science, Honours Mechatronics Engineering

Sept. 2013 – April 2019

PUBLICATIONS

Bayes' Rays: Uncertainty Quantification for Neural Radiance Fields <i>L. Goli, C. Reading, S. Sellán, A. Jacobson, A. Tagliasacchi</i>	CVPR 2024 <i>Highlight</i>
BANF: Band-limited Neural Fields for Levels of Detail Reconstruction <i>A. Shabanov, S. Govindarajan, C. Reading, L. Goli, D. Rebain, K. M. Yi, A. Tagliasacchi</i>	CVPR 2024
InterTrack: Interaction Transformer for 3D Multi-Object Tracking <i>J. Willes, C. Reading, S. Waslander</i>	CRV 2023 <i>Oral Presentation</i>
Categorical Depth Distribution Network for Monocular 3D Object Detection <i>C. Reading, A. Harakeh, J. Chae, S. Waslander</i>	CVPR 2021 <i>Oral Presentation</i>
Unlimited Road-scene Synthetic Annotation (URSA) Dataset <i>M. Angus, M. ElBalkini, S. Khan, A. Harakeh, O. Andrienko, C. Reading, S. Waslander, K. Czarnecki</i>	ITSC 2018

TECHNICAL SKILLS

Languages: Python, Bash, C/C++, MATLAB

Developer Tools: Git, GitHub, GitLab, VS Code, Docker, Apptainer

Libraries: PyTorch, NumPy, Kornia, Open3D, Diffusers, Nerfstudio, Threestudio, Weights & Biases, Streamlit

Concepts: Computer Vision, Generative Models, Diffusion Models, 3DGS, Object Detection and Tracking