Cody Reading

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Work Experience

Senior Researcher July. 2024 – June 2025

Huawei Technologies | Python, PyTorch *Markham, Canada / London, United Kingdom*

- Developed a mobile robotics pipeline, implementing odometry, SLAM (FastSLAM), planning (A*/DWA), and controller (PD) algorithms, deploying in both simulation and on real hardware (Wheeled Base/Quadraped)
- Built an interactive demo integrating LLM-based control with a ViperX robotic arm to play checkers, using Deepseek R1, Qwen 2.5, or Llama 3
- Implemented a 3D scene graph estimation and segmentation technique, enabling object search and pick/place for a mobile robot equipped with a robotic arm
- Developed an accurate 3D object auto-labeling tool, generating 6D pose, 2D bounding boxes, and 2D masks labels for multiple objects in indoor environments

Machine Learning Research Associate Jan. 2022 – Aug. 2023

Monsters Aliens Robots Zombies | Python, PyTorch *Toronto, Canada*

- 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 learned (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

Software Engineer - Autonomous Driving Jan. 2018 - Aug. 2018

NVIDIA Corporation | C++ *Holmdel, United States*

- 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

Academic Experience

Computer Vision Researcher - 3D Generation Sept. 2023 – April 2024

Simon Fraser University | Python, PyTorch *Burnaby, Canada*

- 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

Computer Vision Researcher - 3D Perception Sept. 2019 – Dec. 2021

University of Toronto | Python, PyTorch *Toronto, Canada*

- 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

Semantic Segmentation Research Co-op May 2017 - Aug. 2017

University of Waterloo | Python, C++, Caffe *Waterloo, Canada*

- 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, Canada
Master's of Applied Science, Aerospace Engineering — *Sept. 2019 – Dec. 2021*

University of Waterloo — Waterloo, Canada
Bachelor of Applied Science, Honours Mechatronics Engineering — *Sept. 2013 – April 2019*

Publications

Ark: An Open-source Python-based Framework for Robot Learning — arXiv 2025
*M. Dierking, C. Mower, S. Das, H. Helong, J. Qiu, **C. Reading**, W. Chen, H. Liang, H. Guowei, J. Peters, Q. Xingyue, J. Wang, H. Bou-Ammar*

Bayes' Rays: Uncertainty Quantification for Neural Radiance Fields — CVPR 2024
*L. Goli, **C. Reading**, S. Sellán, A. Jacobson, A. Tagliasacchi* — *Highlight*

BANF: Band-limited Neural Fields for Levels of Detail Reconstruction — CVPR 2024
*A. Shabanov, S. Govindarajan, **C. Reading**, L. Goli, D. Rebain, K. M. Yi, A. Tagliasacchi*

InterTrack: Interaction Transformer for 3D Multi-Object Tracking — CRV 2023
*J. Willes, **C. Reading**, S. Waslander* — *Oral Presentation*

Categorical Depth Distribution Network for Monocular 3D Object Detection — CVPR 2021
***C. Reading**, A. Harakeh, J. Chae, S. Waslander* — *Oral Presentation*

Unlimited Road-scene Synthetic Annotation (URSA) Dataset — ITSC 2018
*M. Angus, M. ElBalkini, S. Khan, A. Harakeh, O. Andrienko, **C. Reading**, S. Waslander, K. Czarnecki*

Technical Skills

Languages: Python, Bash, C/C++, MATLAB
Developer Tools: Git, GitHub, GitLab, VS Code, Docker, Apptainer
Libraries: PyTorch, NumPy, Scipy, Scikit-learn, Kornia, Open3D, Diffusers, Nerfstudio, Threestudio, Weights & Biases
Concepts: Computer Vision, Generative Models, Diffusion Models, 3DGS, Object Detection and Tracking