

Cody Reading

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EXPERIENCE

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

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

PUBLICATIONS

- 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