Emily Zhi Xuan Zeng

LINKS

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EDUCATION

UNIVERSITY OF WATERLOO
MASc
System Design Engineering
2021-present
Supervised by
Dr. Alexander Wong

UNIVERSITY OF WATERLOO
BASc
Mechatronics Engineering
2016-2021

SKILLS

LANGUAGES
Python • C++

TOOLS
Pytorch • Keras/Tensorflow • Scikit-learn • Docker

SUBJECTS
Computer Vision
• Object Detection
• Image Segmentation
• Pose Detection
Reinforcement Learning
Text to speech
General Machine Learning

WORK EXPERIENCE

NVIDIA | Computer Vision Intern   May-Aug 2021
Incorporated synthetic data for training lane detection model
- Developed data pipeline and experimented with ways to incorporate synthetic data to best target challenging scenarios in dangerous driving conditions
- Resolved critical failure scenarios blocking PathNetV4 release and improved quantitative performance metrics
- Developed tools to better visualize and identify challenging scenarios

NVIDIA | Computer Vision Intern   May-Aug 2020
Time series light signal detection for autonomous vehicles
- Detection of blinking light signals, eg. turn signal, brake signal, hazard lights, etc.
- Laid groundwork by defining labelling guidelines, potential model architectures
- Trained proof of concept classification network using public data

MIOVISION | Computer Vision Intern   Sep-Dec 2019
Traffic data analysis with computer vision
- Led project to introduce active learning techniques to data ingest pipeline
- Optimized selection of images for labeling from large unlabelled pool via estimating model uncertainty (monte carlo dropout)
- 42% improvement in mean average precision between model trained on most uncertain images compared to the least

SYNAPSE TECHNOLOGY Computer Vision Intern   Jan-April 2019
Developed and analyzed CNN models for detecting threats in security x-ray scans
- Developed fine grain rotational data augmentation method for object detection
- Significantly improved model performance in underrepresented classes

PRAEMO | Data Scientist   May-Aug 2018
Used LSTM to detect anomalies in time series vibration data and predict machine failure in industrial robots

ESI | Robotics Software Developer   Sep-Dec 2017
Robotic navigation using reinforcement learning (Deep Q-learning) and IR sensors
- 95% success rate in simulation and 85% success rate on physical robot

PUBLICATIONS

Zeng, E Zhixuan, Adrian Florea, and Alexander Wong (2022). "COVID-Net US-X: Enhanced Deep Neural Network for Detection of COVID-19 Patient Cases from Convex Ultrasound Imaging Through Extended Linear-Convex Ultrasound Augmentation Learning". In: *arXiv preprint arXiv:2204.13851*.

Chen, Yuhao et al. (2021). "MetaGraspNet: A Large-Scale Benchmark Dataset for Vision-driven Robotic Grasping via Physics-based Metaverse Synthesis". In: *arXiv preprint arXiv:2112.14663*.

PROJECTS

AUTOREAD | 🔗   April 2021
Text to speech model for fiction novels trained using automatically labeled audiobook dataset

UM DETECTOR | Hack the North   Sept 2019
CNN Audio classifier for conversational filler words (ie "um")

SIMPLE YOGI | Hack Princeton   Nov 2019
Yoga pose correction and classification with Posenet