Hayden Gunraj

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Skills

- Languages – Python, MATLAB, C++, C
- Libraries – PyTorch, TensorFlow, OpenCV, Keras, scikit-learn, scikit-image
- Concepts – Deep Learning, Computer Vision, Image Analysis, Machine Learning

Experience

Research Engineer — Huawei Human-Machine Interaction Lab — May 2020 – Aug. 2020

- Designed and implemented generative adversarial networks to create photorealistic images from 3D models
- Integrated conditional generation models into an end-to-end 2D image and 3D annotation synthesis pipeline

Deep Learning Developer — DarwinAI Corp. — Jan. 2020 – April 2020

- Developed and trained deep neural networks for proof-of-concept studies with industry partners
- Optimized deep learning models using a proprietary tool for fast inference on edge devices
- Collaborated with DarwinAI researchers to explore generalizable data augmentation techniques

Deep Learning & Comp. Vision Eng. Intern — Synapse Technology Corp. — May 2019 – Aug. 2019

- Used TensorFlow to train convolutional neural networks for automated threat detection in X-ray images
- Built and deployed models for automatic cigarette lighter detection at an international airport
- Designed an object-level image retrieval pipeline to better leverage large sets of unlabelled data

Research Assistant — Vision & Image Processing Research Group, UWaterloo — Jan. 2019 – April 2019

- Leveraged scikit-learn to train traditional learning algorithms for prostate cancer detection in MR images
- Implemented image feature extraction and data augmentation pipelines based on state-of-the-art methods
- Trained convolutional neural networks for segmentation using Keras, achieving a Dice score of 0.93

Industrial Imaging Software Developer — P&P Optica — Sept. 2018 – Dec. 2018

- Created Python tools for calibration and operation of a hyperspectral imaging system
- Trained and tested support vector machines for material classification and composition analysis

Medical Software Developer — Sunnybrook Research Institute — Jan. 2018 – April 2018

- Developed novel segmentation and analysis algorithms for cardiovascular MR images using MATLAB
- Integrated new algorithms into a fully automated analysis pipeline to reduce manual work for clinicians

Projects

COVIDNet-CT — April 2020 – Present

- Designed and developed convolutional neural networks for COVID-19 infection detection in chest CT images
- Curated CT image data from multiple sources to create a large-scale and high-quality CT image dataset
- Developed novel data augmentation methods to address unique biases present in the CT dataset

Education

University of Waterloo — BASc Candidate, Mechatronics Engineering — Sept. 2016 – Present

- Relevant Courses – Algorithms and Data Structures, Adaptive and Cooperative Algorithms, Data Mining