NICHOLAS GREIG

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EDUCATION

2013 - 2020
BS Bachelor of Mechatronics Engineering (Honours H2A)/Bachelor of Science (Extended major in computational science)
- Faculty of Engineering Dean's Honours List Member 2020

EMPLOYMENT HISTORY

2022 – Present **Deakin University**
September 2022 – Present ***Casual Research Assistant***
- Working with Richard Dazeley on a literature review of AI and AGI safety proposals

2022 – Present **Independent Machine Learning Researcher**
June 2022 – Oct 2022 ***Machine Learning Researcher***
- Received a short-term research grant from the Long Term Future Fund to up-skill in neural network interpretability for AGI safety

2021 – 2022 **RMIT Integrated Photonics Applications Centre**
Aug 2021 – June 2022 ***Research Assistant***
- Completed internal photonics introductory course
- Used EME software and Python to simulate the performance of a silicon nitride material for various wavelengths and passive circuit components, including ring resonators, directional couplers and vertical inverse taper couplers
- Wrote custom technology stack and components as PCells in IPKISS framework, for exporting designed components to GDSII masks

2019 – Present **Additive Assurance**
Jan 2021 – Aug 2021, June 2022 – Present ***Software Engineer (Data Analytics)***
Nov 2019 – Feb 2020 ***Machine Learning Research Intern***
- Created and trained a multi-output segmentation CNN to detect various types of defects in high resolution images of 3D printed metal parts during manufacturing
- Converted local back-end Python code to cloud appropriate code, by creating and testing Docker images and then deploying those Docker images to AWS instances.
- Created a 3D CNN and a 2D recurrent CNN to segment multiple defect types from images of 3D printed metal parts during manufacturing
- Performed literature review and quantitatively evaluated the relevance and efficacy of various superpixel segmentation techniques for printed part defect detection

- Developed a synthetic dataset and trained a lightweight, custom object detection system based upon a recent state of the art object detection architecture for detection of custom printed patterns

2019 – 2020 **Sentient Vision Systems**
Jul 2019 -Mar 2020: ***Machine Learning Software Developer***
Jan 2019 – Jul 2019 ***Machine Learning Research Intern***

- Migrated existing object detection code-base from Keras into a new in-house deep-learning prototype/design and training framework
- Orchestrated continuous literature review, proposing and implementing new ideas based upon current state of the art methods in recent research
- Designed and created a prototype deep learning framework using Pytorch, which incorporated recent best practices and promising computer-vision based deep learning ideas, culminating in a MVP prototype for demonstration purposes. This work focussed on small object detection and classification from aerial imagery in high resolution nadir images.

NOTABLE PROJECTS

Jan 2020 – Nov 2020 **Capstone Engineering Project**

Over 2 semesters I performed an in-depth literature review of the current state of photonic neural networks and photonic co-processors for AI. After this, I proposed a novel design for a theoretical eletro-optic ReLU neuron for high throughput on-chip training of neural networks, and simulated the analog electronic circuits required for its functioning in MATLAB's Simulink.

Jul 2019 – Jan 2020 **Monash DeepNeuron Vision Team Leader**

As team leader of the Vision sub-team of the Monash student-run group DeepNeuron, I created a framework to train and deploy a multi-class, multi-object detection system, written in TensorFlow, for the purposes of real-time object detection on embedded devices. This object detection framework was based upon the recent trend of keypoint pixelwise classification. During this time I also coordinated the activities, education and work of the two other members of my team.

SKILLS

Proficient in Python, growing competence in Rust

Experienced in using both Pytorch and Tensorflow for the creation of deep neural networks, primarily for semantic segmentation, object detection and image classification.

Strong mathematical and communicational skills

Able to work well under pressure in fast-paced team environments