Sam Donald

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Work Experience

NASA Ames Research Center — Mountain View, CA, USA

Intelligent Systems Intern (Aug. 2019 – Dec. 2019)

- Member of interdisciplinary team consisting of astrophysicists, data scientists and machine learning engineers, tasked with designing deep learning methods for exoplanet identification.
- Created custom deep neural networks for exoplanet identification using data from the TESS and Kepler missions under the mentorship of Dr. Hamed Valizadegan.
- Built a transfer learning framework to leverage existing information from the Kepler dataset.
- Worked extensively with NASA's Pleiades supercomputer for training of networks.

Rocket Lab USA — Auckland, New Zealand

Integrated Electrical Systems Engineer I (May 2020 – Apr. 2021)

- Integrated Systems team member for 18 successful launches of the Electron orbital rocket.
- Responsible for electrical energy modeling of the upcoming NASA CAPSTONE mission, utilizing a custom energy simulator created independently in Python.
- Produced system schematics for the NASA CAPSTONE mission, from initial design to production.

Junior Avionics Integration Engineer (Nov. 2018 – May 2020)

- Designed and implemented an automated system in Python to validate, document and publish tests conducted on the rocket prior to launch, reducing 120 engineering hours of work per rocket.

Avionics Intern (Nov. 2017 – Feb. 2018)

- Led a project implementing a heating system on the Electron rockets electric turbo pumps, ultimately increasing the launch window from two to six hours.
- Assisted Guidance Navigation and Control engineers in designing the heaters control algorithm.

TE Connectivity — Christchurch, New Zealand

Engineering Intern (Nov. 2016 – Feb. 2017)

- Built a RaspberryPi based computer vision testing platform to fully automate assembly line testing of cables.

Education

Virginia Tech — Blacksburg, VA, USA

Master of Science, Computer Science (Aug. 2021 – Present)

- Cumulative GPA: 4.0/4.0
- Member of Dr. Adrian Sand's Computational Science Laboratory (CSL) research group.
- Coursework in Data Analytics, Deep Learning and Reinforcement Learning.
- Head GTA for Intermediate Programming in Python and Intro to Computational Thinking.

University of Canterbury — Christchurch, New Zealand

Bachelor of Engineering, Major in Mechatronics (Feb. 2015 – Dec. 2018)

- Cumulative GPA: 8.7/9.0 (A+ average, USA 3.97 equivalent).
- Graduated top of class.
- Coursework focusing on neural networks, electronics, control systems, and robotics.

Projects

DeepONets 2021-Present

- Ongoing work within Dr. Adrian Sandu's CSL research group at Virginia Tech exploring potential applications of deep operator neural networks (DeepONets).
- Currently focused on solving PDE inverse problems with limited data.

Painting with GANs (link) 2022-Present

- Ongoing work using customized GANs to "paint" ink drawings I have created over the last year.
- Input styles are sourced from personal photos of various textures and scenes.

MaRLo (link) 2021

- Developed Deep Reinforcement Learning agents to complete levels of the video game Super Mario Bros.
- Compared performance of Deep-Q Learning, Double Deep-Q Learning, and Dueling architectures.
- Trained on multiple RTX 6000s via Lambda Labs cloud servers.

Chess AI (link) 2015-2021

- Created a computer vision-based chess system for interpreting gameplay on a physical board.
- Developed chess engines from scratch in Python using quiescence searches.

Online Courses (link) 2018 – 2021

- Completed Stanford's CS231n, Neural Networks and Deep Learning (Coursera) online.

SLAM Robot 2017-2018

- Final year project creating a search robot utilizing GreenWaves Technologies new Gap8 parallel processor under the mentorship Dr. Steve Weddle.
- Designed a novel parallelizable SLAM algorithim based Hough transform comparisons in C.

Academic Awards and Achievements

NASA International Internship and New Zealand Space Scholarship, MBIE 2019

Fulbright Scholarship Finalist 2018, 2020

University Prize in Engineering, University of Canterbury (UC) 2018

Vice Chancellors Excellence Award in Philosophy, UC 2018

Milmeq Undergraduate Scholarship, Milmeq 2017

College House Academic Scholarship, College House 2016

Mechatronics High Achievers Awards, UC 2015 – 2018

Dux Scholarship, UC 2015

Emerging Leaders Scholarship, UC 2015

Engineering High Achievers Scholarship, UC 2015

Headmasters Scholarship, Wanganui Collegiate School 2010

Geoff Austin Academic Scholarship, St. Georges School 2008

Interests

Skiing, hiking, drawing, hammer throw, yoga, meditation, chess.