

Albert Haladay

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Summary

A machine learning and AI enthusiast with an MSc in Machine Learning (Distinction) and a BSc in Theoretical Physics (Hons, 1st Class). I am skilled in data analysis, deep learning, reinforcement learning, and computer vision. Additionally, I am proficient in several programming languages, including C/C++, Python, and SQL. I am capable of applying various algorithms and design patterns to tackle complex problems and I am eager to apply analytical and problem-solving skills to design creative machine-learning solutions in a collaborative workspace environment.

Education

University of Nottingham

MSc Machine Learning in Science

Sept 2023 – Sept 2024

- **Classification:** Distinction
- **Relevant Coursework:** Computer Vision, Reinforcement Learning, Transfer Learning
- **Skills:** Data Preprocessing, Model Evaluation, Deep Learning

BSc Theoretical Physics (Hons)

Sept 2020 – Jun 2023

- **Classification:** First Class
- **Relevant Coursework:** Quantum Mechanics, Lagrangian Mechanics, Fourier Analysis
- **Skills:** Problem-Solving, Data Analysis, Numerical Methods

The King Edmund School

A Levels

Sept 2018 – Jun 2020

- *Physics (A*)*
- *Computer Science (A*)*
- *Mathematics (A*)*
- *Further Mathematics (A)*

Projects

Quantum Reinforcement Learning

[Link](#) 

- Created multiple RL agents in the Cartpole environment, using neural networks and parameterised quantum circuits.
- Implemented three policy-gradient algorithms: REINFORCE, actor-critic, and PPO.
- Demonstrated a marginal performance improvement for agents using a simulated quantum circuit at the expense of unstable training dynamics.

Image Segmentation in Agriculture

[Link](#) 

- Developed encoder-decoder CNNs for semantic image segmentation of flowers in MATLAB, focusing on classifying pixels into “petal” and “background” categories.
- Designed a U-Net model with 300K parameters and used Google’s DeepLabV3+ architecture with 20.6M parameters, leveraging the pre-trained weights from ResNet18.
- Achieved F1 scores of 0.92 with the custom U-Net and 0.96 with the DeepLabV3+ architecture, demonstrating the benefits of advanced architectures and transfer learning.

Safer Self-Driving Vehicles

[Link](#) 

- Collaborated to develop CNNs in TensorFlow, which drove a vehicle, navigating and avoiding obstacles in real-time.
- Designed custom models and fine-tuned pre-trained networks using transfer learning. Training data recognised and responded to road markings, traffic lights, pedestrians, and obstacles based on camera input.
- The vehicle was able to approximate human behaviour in complex environments, emphasizing safety and addressing many challenges in real-time decision-making.

Interests

Outside of academics, I was on the team for my university’s boxing society, which ingrained in me the value of discipline and perseverance. I’m an avid reader, programmer, and musician, with a passion for technology and AI and I am always looking to learn new skills and improve my existing ones.

Technologies

Languages: C++, C, Python, MATLAB, SQL, \LaTeX

Frameworks & Libraries: TensorFlow, Keras, Pandas, NumPy, Matplotlib, Seaborn, Scikit-Learn

Skills: Computer Vision, Data Visualisation, Transfer Learning, Reinforcement Learning, Deep Learning, Statistics, Version Control (Git), Jupyter, Docker, Build Systems (CMake), Command Line Tools