Ross Gardiner : *Curriculum Vitae*

Contact

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Programming Languages

Bash, Python, C++, C, Haskell, Java, C#, LaTeX, MATLAB, HTML/CSS, R

Recent Technologies

PyTorch, OpenCV, Tensorflow/Keras, NVIDIA CUDA, Linux, MS .NET, Qt, Doxygen, Sphinx, Google Test, Docker

Miscellaneous Skills

UK Driver's Licence, Video and Photo Editing, Electronics Design/Manufacture, Vehicle Repair, Woodwork, Rock Climbing

Awards/Recognition

Year in Industry Contribution to the Business Awards: Scottish Winner (2016),

Year in industry IETF Future Industry Leaders Awards: Innovation Prize (2016);

Leonardo Employee Recognition Award (2019)

About

PhD Candidate in Artificial Intelligence at the University of Exeter, with an **MEng in Electronics and Software Engineering** and **four years of combined industrial experience**. My research focusses on the development of machine learning for ecology applications, I am particularly interested in addressing challenges around data scarcity and domain-specific complexity. I am seeking opportunities that complement my PhD, allowing me to apply my expertise in electronics, software engineering and AI methodologies to cutting-edge technological and environmental research.

Publications

Towards Ecologically Meaningful Foundation Models – 2026
Nature Machine Intelligence (in review)
Led a perspective piece from a range of experts describing how large scale models could create meaningful representations for tackling problems in ecology.

Bridging Domain Gaps for Fine-Grained Moth Classification Through Expert-Informed Adaptation and Foundation Model Priors – 2025
Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops
Advances insect camera trap AI through foundation models, expert knowledge and compression with knowledge distillation.

Towards Scalable Insect Monitoring: Ultra-Lightweight CNNs as On-Device Triggers for Insect Camera Traps – 2025
Methods in Ecology and Evolution: AI for Conservation Special Feature
Develops efficient and explainable AI, quantised for microcontroller deployment, to enable scalable insect monitoring.

Motion vectors and deep neural networks for video camera traps – 2022
Ecological Informatics Journal
Contributes to advancements in animal detection in challenging environments via divergence from traditional PIR sensors.

Employment History

University of Exeter – September 2023 – 2027   University of Exeter
Postgraduate (PhD) Researcher and Teaching assistant
My current research includes: how large-scale self-supervised foundation models can leverage multiple modalities to model what an organism looks alongside when and where it was observed; how explainable-AI techniques can be explored to build trust in learned representations from fine-grained and long-tailed training datasets; how AI can operate at the edge in conjunction with growing specialised conservation hardware solutions.

DynAikon Ltd. – June 2021–March 2023   Entirely Online
Software Developer & Research Assistant
I worked primarily as the project lead for our software package, DynAikonTrap. This is a fully open-source camera trap with some AI capability and integration with our web API for observation logging. Our novel design, uses video encoding artefacts and convolutional neural networks to detect animal presence in a live video feed. Aspects are discussed in our paper. I have been involved in every aspect of software development, communication, product support and liaison with our funding consortium. I also produced my final-year MEng research project from work completed on DynAikonTrap: successfully halving the system power consumption, accelerating our CNN detectors via weight quantisation and adding capability to distinguish humans from animals in video feed.

Imagination Technologies – June–Sept. 2020   Kings Langley, Watford
Vision & AI Research Intern
As a Research Intern on the Compiler Team, I analysed image metrics to assess neural network quality, specifically for GANs. I developed a **Python**-based evaluative test for a **Jenkins** server, integrating it into the compiler's fault-checking pipeline. My responsibilities included Agile collaboration, participating in stand-ups, and producing detailed reports.

Leonardo UK Ltd. — Aug. 2018–June 2019 Crewe Road, Edinburgh
Undergrad Placement Engineer (Systems Dept.)
In my university gap year at Leonardo, I focused on radar simulation product development, managing quarterly software releases and implementing algorithms with real-time GPU processing using NVIDIA CUDA API. I successfully mastered new technologies, contributing to hardware acceleration improvements. My work culminated in a well-received report on these advancements and their integration into existing products.

Leonardo UK Ltd. — June–Sept. 2017 Crewe Road, Edinburgh
Summer Placement Engineer (Systems Dept.)
I enhanced my radar imaging simulation project, achieving a tenfold increase in simulation speed by implementing hardware acceleration with **C/.NET** and NVIDIA **CUDA C**. My role included conducting weekly progress meetings, documentation in a lab book, and presenting results, which enabled simulations to complete in a lunch break instead of overnight.

Leonardo UK Ltd. — August 2015 –July. 2016 Crewe Road, Edinburgh
Year in Industry Student (Systems Dept.)
Selected for Leonardo's Systems Engineering Year in Industry program straight from high school, I developed software to simulate specialised synthetic aperture radar ground imaging. This involved creating a "virtual" flight trial using digital terrain from freely available map data. The transition required significant adaptation; I completed a five-day company radar course, learned to develop robust **C/.NET** software to company standards, and built resilience and self-awareness. My contributions earned multiple Year in Industry awards and led to an invitation to return the following summer.

Education

MEng, Electronic and Software Engineering — Sept. 2016–June 2022 University of Glasgow
I graduated from the James-Watt School of Engineering **with Honours of the First Class**. My degree includes a practical mix of electronic design with computing science theory and application. I have enjoyed working on team projects throughout my studies. For two such projects in my final year, I took on the role of lead programmer. This involved managing our team's overall direction and ownership of event-driven software in **C/C++** . As part of GUSTS - Glasgow University Sustainable Technology Society I served as Projects Manager in the 2020-2021 committee group and helped organise events promoting sustainable engineering projects on campus. I've also been a keen member of the University Surf Club, which has been a lot of fun. Finally, I enjoyed serving as a lab demonstrator for a **Python** web app development course, where I learned teaching methods and solidified my own knowledge.

Selected achieved grades tabulated below; achieved an **overall GPA of 18.6/22.0**:

Course	Grade	Year	Course	Grade	Year
Individual Project (Final Year)	A2	5th	Digital Signal Processing	A3	4th
Real-time Embedded Programming	A2	5th	Renewable & Sustainable Energy	A4	4th
Design Special Topic	A4	5th	Digital Circuit Design	A1	3rd
Functional Programming	A2	4th	Electronic System Design	A2	3rd

Open University Modules — 2014–2016 Open University (Online)
Throughout my final year of high-school and my Year in Industry placement, I studied remotely for M250 - Object-oriented Java programming and M269 - Algorithmns, data structures and computability, achieving a Pass grade for both. These modules have served as my first qualification in the computing/software engineering world and helped fuel my interest in the subject.

Open-Sourced Software Projects

DynAikonTrap - AI Camera Trap for Biodiversity Monitoring — June 2021–Present Python/C
Codebase: gitlab.dynaikon.com/dynaikontrap Our published paper: doi.org/10.1016/j.ecoinf.2022.101657
Documentation: dynaikon.com/trap-docs/
My final-year dissertation: gitlab.dynaikon.com/rossg/2190583_Gardiner_ENG5041P_Final_Year_Report/

Signapse - AI Sign Language Teacher — Jan.–May 2022 C++/C
A simple event-driven video processing app using a convolutional image classifier to teach hand signs via a user interface.
Codebase: github.com/albanjoseph/Signapse Wiki: github.com/albanjoseph/Signapse/wiki
Documentation: albanjoseph.github.io/Signapse

AudiClean - Event-driven Audio Filtering Library — Jan.–May 2022 C++/C
Extension of the SoX audio library, provides implementation of novel audio filtering mechanisms and a command-line interface.
Codebase: github.com/rossGardiner/AudiClean Documentation: rossgardiner.github.io/AudiClean

NextSteps - Sports-ground Test Equipment Driver — Sept. 2019–May 2020 Java
Codebase: github.com/rossGardiner/next-steps