

Ross Gardiner : *Curriculum Vitae*

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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

Enthusiastic **MEng Electronics and Software Engineering graduate** embarking on a **PhD in Environmental Intelligence** at the University of Exeter. I have a keen interest in applications of machine learning and methods in ecological research. I am currently seeking opportunities complementary to my PhD, working with cutting-edge technologies wherein a strong foundation in electronics, software engineering and AI methods may be applied.

Publications

Preprint (under review) – 2024

Towards Scalable Insect Monitoring: Ultra-Lightweight CNNs as On-Device Triggers for Insect Camera Traps

Develops efficient and explainable AI, quantised for microcontroller deployment, to enable scalable insect monitoring.

Ecological Informatics Journal – 2022

Motion vectors and deep neural networks for video camera traps

Contributes to advancements in animal detection in diverse environments via divergence from traditional PIR sensors.

Employment History

University of Exeter – September 2023 – Present

University of Exeter

Postgraduate (PhD) Researcher and Teaching assistant

My research is focused on the development of AI technologies for biodiversity monitoring. I am particularly interested in: how large-scale self-supervised foundation models can be leveraged for rapid ecological assessment, how explainable-AI techniques can be explored to build trust in learned representations from fine-grained and long-tailed training datasets and how AI can operate at the edge in conjunction with growing specialised conservation hardware solutions. I concurrently work as a Teaching Assistant.

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. This is a novel design, using video encoding artefacts and convolutional neural networks to detect animal presence in a live video feed. Aspects are discussed in our paper. As project lead 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 on metrics.

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.

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	5 th	Digital Signal Processing	A3	4 th
Real-time Embedded Programming	A2	5 th	Renewable & Sustainable Energy	A4	4 th
Design Special Topic	A4	5 th	Digital Circuit Design	A1	3 rd
Functional Programming	A2	4 th	Electronic System Design	A2	3 rd

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 early interest in the subject.

Peebles High School – 2010–2015

Springwood Rd, Peebles

Open-Sourced Software Projects

I am passionate about open sourced software. Many of my own contributions to software in the public domain are available on my personal GitHub site and through DynAikon's public git repository. Below are some example projects I am proud of.

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

Personal Interests

In my free time I am keen on exploring the great outdoors. My favourite past-times are **camping, climbing and surfing** when I get the chance. During time off, you can find me exploring the west coast with my girlfriend in our camper van and throughout much of this summer I have been enjoying Scotland's diverse range of **rock climbing** venues. I also love training for climbing and bouldering in my local gym and take a keen interest in fitness and nutrition.

How's my work? I'd be thrilled to receive any feedback on my CV you may have: [complete my survey](#).

This CV has been created and edited using \LaTeX , the style sheet used is provided under GPLv3 on [my GitHub](#).