Toby Godfrey

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Summary

Passionate and driven computer science researcher with a focus on swarm robotics, machine learning, and embedded systems. Experienced in developing UAV swarm platforms and safety-critical control software, alongside mentoring students and project management. Seeking opportunities to expand technical capabilities and contribute to impactful projects.

Education

Doctor of Philosophy in Computer Science, *University of Southampton* 2024 – Present

- Research focuses on swarm robotics and machine learning
- Supervised by Dr Mohammad D. Soorati and Dr Klaus-Peter Zauner
- Led the design, development and implementation of a custom UAV swarm platform
- Co-supervised several Bachelor's and Master's level students

Bachelor of Science in Computer Science, *University of Southampton* 2021 – 2024

- Graduated with First Class Honours (overall average: 82%)
- Key modules: Programming 1/2/3, Computer Systems 1/2, Distributed Systems and Networks, Robotic Systems, Advanced Computer Networks, Advanced Computer Architecture
- Final-year project: *"Using Language Models for Multi-Robot Coordination"*, selected for showcase as a high-quality and impactful project
- Awards: Netcraft Award and G-Research Prize

A-Levels, *Sir Bernard Lovell Academy* 2019 – 2021

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

GCSEs, *Sir Bernard Lovell Academy* 2014 – 2019

- 10 GCSEs including Mathematics (9), English Language (6), English Literature (7), and English Spoken (Distinction)

Experience

Research Assistant, *University of Southampton* June 2024 – Sept 2024

- Worked at the intersection of large language models, multi-agent reinforcement learning, and multi-robot systems
- Developed using Python, Ray, ROS2 (Humble), and various language model APIs
- Deployed and tested algorithms on TurtleBot3 robotic platforms

Research Assistant, *Lakehead University (Mitacs Globalink)* June 2023 – Sept 2023

- Selected for a highly competitive internship (open to students from 70+ countries)
- Supervised by Dr Thiago E. Alves de Oliveira
- Developed miniaturised tactile sensing modules for autonomous robotic agents
- Gained hands-on experience in PCB design, firmware development (I^2C, ROS), and hardware integration (Raspberry Pi Pico, Arduino, Teensy)
- Strengthened communication skills through regular collaboration on complex topics

Contact Centre Advisor, *Circadian Trust (Active Lifestyle Centres)* Aug 2022 – Sept 2023

- Handled customer queries via phone and email; processed payments and set up direct debits
- Developed strong communication skills and customer service capabilities

Garden Centre Assistant, *Fonthill Garden Centre* July 2019 – April 2023

- Interacted with and served customers in a retail environment
- Assisted in training new staff members, developing communication and teaching skills
- Gained experience in teamwork, time management and responsibility while balancing work with A-levels
- Continued working during university holidays

Work Experience, *Airbus Defence & Space* July 2019

- Completed a week in the Cybersecurity Department
- Rotated across teams including threat prevention, malware analysis, and hardware protection
- Gained exposure to the commercial cybersecurity landscape and technical practices

Work Experience, *Ovo Energy* June 2018

- Shadowed network engineers and programmers in the IT department
- Gained hands-on exposure to IntelliJ IDEA, DNS gateway software, and VPN tunnelling
- Developed an early interest in network engineering and programming in a commercial setting

Skills

Programming Languages
C, C++, Rust, Java, Haskell, R, Python

Embedded Systems & Robotics
ThreadX, FreeRTOS, ROS/ROS2, ArduPilot

Tools & Software
Git, GitHub, GitLab, KiCad, FreeCAD, Fusion 360, LaTeX, Linux, Office Suite, LLM Services

Professional Competencies
Project management, leadership, collaboration, interdisciplinary teamwork

Communication Protocols
I^2C, SPI, UART, CAN

Hardware Platforms
Raspberry Pi, Arduino, Teensy, STM32, sensors and ICs

Specialist Skills
PCB design, embedded electronics, real-time and safety-critical systems

Activities & Achievements

Technical & Leadership Activities

- Member of the Southampton University Formula Student Team (2021–2024)
  - Contributed to software and electronics systems for the team's electric race car
  - Helped achieve 3rd place in the Electric Vehicle Class and won the Faraday Institution Best Newcomer EV award at Formula Student UK 2022
  - Promoted to *Head of Software* (2023–2024); managed 8 subprojects with approximately 60 contributors
  - Oversaw technical direction, software architecture and cross-team integration
- Ran an after-school Computer Science club during A-levels to tutor peers in programming and theory
- Organised and led a team as part of the Duke of Edinburgh Bronze Award, including volunteering at a local youth centre

Awards & Honours

- Netcraft Award – Top 10 highest-achieving students in undergraduate cohort
- G-Research Prize – Award for academic excellence in my final-year undergraduate project

Languages

- English (Native)
- Russian (Conversational)
- Ukrainian (Conversational)

Personal Interests

- Swimming, mountain biking, reading, socialising, cooking

Publications

T. Godfrey, W. Hunt, and M. D. Soorati, 'MARLIN: Multi-agent reinforcement learning guided by language-based inter-robot negotiation', 2024. [Online]. Available: https://arxiv.org/abs/2410.14383 *(Submitted to IROS 2025)*

W. Hunt, T. Godfrey, and M. D. Soorati, 'Conversational language models for human-in-the-loop multi-robot coordination', in Proceedings of the 23rd international conference on autonomous agents and multiagent systems, in AAMAS '24. Auckland, New Zealand: International Foundation for Autonomous Agents and Multiagent Systems, 2024, pp. 2809–2811.

References

References are available upon request.