

Ameer Alhashemi

Birmingham, UK | ameerhashemi.ah@gmail.com | github.com/TallowCatch | linkedin.com/in/ameer-alhashemi
University of Birmingham | English (fluent), Arabic (fluent)

Research interests

I am interested in Cooperative AI and multi-agent reinforcement learning, particularly how interaction outcomes generalise under uncertainty in mixed-motive settings. My focus is evaluation-driven research: building reproducible simulation testbeds and measuring behaviour beyond return, including robustness, stability, and fairness. I am especially interested in sequential social dilemmas and commons-style incentives, partner/incentive distribution shift, and lightweight governance mechanisms such as reputation and decentralised sanctioning.

Education

University of Birmingham

Expected Jun 2026

MEng Computer Science and Software Engineering

- GPA 4.0/4.0; on track for First Class. Chancellor's Academic Merit Scholarship.
- Master's dissertation: REDNET-ML — geospatial environmental risk modelling with emphasis on temporal generalisation and distribution shift evaluation.
- Relevant modules: Machine Learning, Artificial Intelligence, Robotics, Game Theory, Data Structures and Algorithms, Software Engineering.

GEMS Wesgreen International School

2020

AS Levels: AAA (Economics, Mathematics, Physics).

Research experience

RANT — Ant-inspired Multi-Robot Exploration

Python, Webots

- Studied how simple interaction mechanisms enable decentralised coordination under partial observability and noisy sensing, using stigmergic signalling (virtual pheromones) and probabilistic localisation (particle filtering) as mechanisms for implicit communication and memory.
- Ran controlled ablations over team size and coordination/localisation settings and observed consistent improvements in mapping quality (blob recall 33.9%→65.6%, F1 0.223→0.373); documented a reproducible evaluation protocol in a technical report (manuscript in preparation).

AWRP — Arctic Weather-Dependent Routing

Python, multi-objective optimisation

- Framed safe routing as decision-making under time-varying environmental uncertainty by defining explicit efficiency–risk objectives (travel time, ice penalty, weather penalty) and evaluating candidate routes across scenario regimes with feasibility constraints.
- Implemented a dominance-based evolutionary search (NSGA-II) with crossover to explore trade-offs under consistent constraints (e.g., pop=100, gen=25); produced an interactive Pareto-front visualisation and optimisation tables, and wrote up the methodology and evaluation protocol as a structured project report.

REDNET-ML — Geospatial Environmental Risk Mapping

Python, Remote Sensing ML

- Investigated generalisation under temporal distribution shift by fusing multiple detector confidence signals with satellite-derived environmental covariates (e.g., chlor_a, Kd490, nFLH, SST) to estimate HAB risk in a multi-sensor setting.
- Prioritised out-of-distribution evaluation via time-based cross-validation with recall-constrained threshold selection; nonlinear fusion (CatBoost) improved AUPRC to ~0.78 vs. ~0.64 for logistic fusion on future-held-out splits, with evaluation scripts and decision-threshold artifacts packaged for deployment-style inference.

Hemayah — TinyML Fall Detection

Python, TFLite Micro

- Evaluated IMU-based fall detection under user variation and noisy sensing, explicitly testing class imbalance, sensor noise, and operating-threshold choices, and deploying a lightweight streaming model for on-device inference (Arduino Nano 33 BLE).
- Achieved weighted F1 of 0.84 with robustness-oriented evaluation and precision–recall analysis, documented in an individual technical report including experimental protocol and failure-mode analysis for safety-critical alerting.

Other experience / positions of responsibility

Forensics Intern, KPMG Lower Gulf

Jun 2025 – Aug 2025

Internship

- Automated Python workflows for multi-source investigative datasets, improving consistency through validation and normalisation pipelines.
- Applied structured evidence traceability aligned with compliance-style documentation and reproducibility expectations.

Teaching Assistant, University of Birmingham Dubai

Oct 2024 – Dec 2024

Teaching support

- Supported lab sessions and supervised student technical projects, providing structured debugging and methodological guidance.
- Promoted reproducible coding and reporting practices in coursework submissions.

Student President, University of Birmingham Dubai

Nov 2024 – Apr 2025

Student leadership

- Represented students in institutional committees and led cross-department initiatives with faculty coordination.
- Coordinated stakeholder communication across student cohorts and university leadership to support academic experience improvements.

R&D Intern, Stealth Mode Company

Sep 2024 – Oct 2024

Part-time role

- Produced technical research briefs and system-level proposals; evaluated platform architectures for feasibility and scalability.
- Conducted a UX case study analysing user interaction flows and translated findings into product-level design recommendations.

Student Research Assistant, University of Birmingham Dubai

Jun 2023 – Aug 2023

Commissioned research project

- Organised project evidence and synthesised qualitative findings to support a commissioned institutional research study.
- Contributed to report drafting with traceability from claims to supporting evidence, coordinating with Dubai and Edgbaston stakeholders to consolidate the final deliverable.

Research outputs

- Commissioned report: Fostering Student Communities of Practice at the University of Birmingham Dubai. Education Enhancement Fund (EEF), Aug 2023. (Contributor)
- RANT: Ant-Inspired Multi-Robot Exploration Using Particle Filter Localisation and Virtual Pheromone Coordination. (Manuscript in preparation.)

Technical skills

- Programming: Python, C, SQL.
- Machine learning: PyTorch, TensorFlow, scikit-learn, CatBoost; TFLite; robustness/shift evaluation (temporal CV, PR/AUPRC).
- Simulation and modelling: Webots; NetworkX; multi-objective optimisation (NSGA-II via DEAP); stochastic scenario testing & constraint-based evaluation.
- Research tooling: Git, Linux, Docker, LaTeX; reproducible project structuring and experiment logging.

Interests

Cooperative AI and multi-agent systems; evaluation and benchmark design; robustness and distribution shift; governance and norm enforcement mechanisms; reproducible research software; robotics and embedded machine learning.

References

- Associate Professor Shuo Wang — University of Birmingham.
- Professor Yusra Mouzughi — Provost, University of Birmingham Dubai.