

EDUCATION

University of Bristol - Bristol, UK 2023 - 2026

- **BSc Computer Science**, Expected First Class Honours (**GPA: 3.8/4.0**)
- Key Modules: Image Processing & Computer Vision, Machine Learning, Algorithms II and Data, Software Engineering

Charterhouse School – Godalming, UK 2021 – 2023

- **A-Levels: Mathematics(A*), Further Mathematics (A), Computer Science(A)**
- Awarded **Head's Prize** — highest academic distinction for excellence in academics and competitions, including **2nd Place** in the Lockheed Martin National Computing Competition and **Top 1%** in the **British Mathematical Olympiad**.

RESEARCH INTERESTS

- **Multimodal Machine Learning**, particularly in **Vision-Language Models** and **Generative Recommender Models**

RESEARCH & ACADEMIC EXPERIENCE

Research Intern Jul. 2024 — Aug. 2024

Advanced Computing and System (CCNT) Lab, Zhejiang University Hangzhou, China

- Investigated **sensor fusion and navigation reliability** for the RoboNeo S142 autonomous sweeper through controlled experiments with LiDAR, depth cameras, and IMU sensors, evaluating SLAM algorithm performance under varying environmental conditions.
- Designed and integrated a **low-latency ROS-based safety broadcast module**, achieving real-time alerts (<50 ms) while empirically quantifying its contribution to overall system responsiveness.
- Conducted systematic **stress and reliability tests** under high-temperature environments, producing detailed **performance evaluation reports** and identifying scheduling bottlenecks that restored full automation reliability.
- The robust system developed from these contributions has been successfully deployed to real-world clients, demonstrating reliable performance in daily commercial operations.

Final Year Project - Video Embedding Model for Retrieval and Semantic Search Oct. 2025 — May. 2026

Supervisor: Junxiao (Shawn) Shen Bristol, UK

- Designing and Implementing **multi-modal video embedding models** for semantic retrieval and cross-modal understanding, with an emphasis on temporal representation learning and video-text alignment.
- Examining **contrastive learning** and **embedding fusion** frameworks to enhance spatial-temporal reasoning and improve retrieval performance in large-scale multimodal datasets.

Teaching Assistant (Graduate Teacher Level 2) Sep. 2025 — May. 2026

School of Computer Science, University of Bristol Bristol, UK

- Mentored second-year **Computer Science** students on **Software Engineering Project** unit, providing technical and project management guidance throughout development.
- Assisted the unit director in evaluating deliverables and supporting students' application of agile practices and software engineering principles.

INDUSTRY & LEADERSHIP EXPERIENCE

Backend Intern May. 2025 — Sep. 2025

Tencent Shenzhen, China

- Developed core components of Tencent's **overseas advertising platform**, building the end-to-end ad delivery pipeline from scratch to support **WeChat, TME**, and other business lines, sustaining peak throughput of **600K+ QPS**.
- Built a **DAG (Directed Acyclic Graph)** orchestration engine to manage parallel task execution and dependency resolution, optimizing throughput under high concurrency.
- Architected the **ADX-OP integration layer**, enabling direct OpenRTB request parsing and multi-protocol response unification (**VAST/Native/Banner**), with standardized error encapsulation and recovery mechanisms.
- Established the full infrastructure on **AWS EKS**: utilized **Consul** for service discovery, **Helm** for Kubernetes packaging, and **AppConfig** for dynamic configuration in a containerized **CI/CD workflow**, reducing deployment latency from **8 minutes to 2 minutes**.

Co-Founder, President & Core Team Lead

Sep. 2024 — Present

Bristol Formula Student AI

Bristol, UK

- Co-founded and lead a 50-member team developing an **Autonomous Driving System (ADS)** for the Formula Student AI competition, defining system architecture and integration across perception, localization, and control modules.
- Developed the **perception pipeline** for cone detection using YOLO11, trained on the **FSOCO dataset** and integrated with ZED stereo cameras, enabling real-time track boundary extraction.
- Built a scalable **software infrastructure** supporting distributed development, hardware-in-the-loop testing, and reproducible experimentation of perception and control modules.
- Designed a modular **simulation-to-reality framework** to align virtual testing with on-track performance, enhancing robustness and data efficiency.

SELECTED PROJECTS

Tencent Advertising Algorithms Competition (Top 10%)

Jul. 2025 – Sep. 2025

- Tackled the **next-item prediction challenge** by moving beyond standard dual-tower architectures, capturing complex user-item-sequence interactions through a **multi-modal generative recommendation system**.
- Adapted the **HSTU architecture (Meta, ICML 2024)** by replacing its softmax/FFN block with a **Relative Attention Bias (RAB)** mechanism, reducing complexity from $O(n^2)$ to $O(n)$ and enhancing long-range dependency modeling.
- Extended baseline dual-tower models (SASRec) into a **three-tower framework** (User/DCN + Item/DCN + Sequence/HSTU), incorporating **InfoNCE-based contrastive learning** with cross-time negative sampling to improve representation robustness.
- Optimized preprocessing and temporal handling, reducing per-epoch training time from **1h to 15min** and inference from **1h to 20min**. Achieved a **3.3× score improvement** ($0.023 \rightarrow 0.076$), ranking in the **Top 10%** among 2000+ teams.

Apple Swift Student Challenge | Distinguished Winner (Top 50 Worldwide)

Jan. 2025 – Feb. 2025

- Conceived and built “SmartFridge,” an interactive Swift Playgrounds app that tackles food waste by guiding users through the entire food management lifecycle—from tracking and expiry alerts to recipe suggestions and shopping.
- Driven by user research that identified poor visibility as a key cause of waste, the design focuses on a single-screen interface for at-a-glance inventory status, making sustainability intuitive and actionable.
- Iterated through **Figma prototypes** and **SwiftUI builds** with modular state management and custom animations, creating a seamless, educational user experience recognized for its **fusion of technical execution, product design, and social impact**.

mmWave Radar Sensor – Texas Instruments

Sep. 2024 — May. 2025

Software Engineering Group Project, University of Bristol

- Built a **human pose recognition system** using the **IWRL6432BOOST** mmWave radar and custom point cloud preprocessing pipelines for real-time motion detection.
- Implemented and tuned a 3-layer **MLP classifier** in PyTorch, improving classification accuracy by **23.7%** over the baseline through enhanced feature extraction and noise filtering.
- Set up **automated model training and evaluation workflows** with GitHub Actions to ensure consistent experiments and smooth team collaboration.

TECHNICAL SKILLS

Programming	Python, C++, Java, Swift, Go
ML Frameworks	PyTorch, TensorFlow, Scikit-learn, OpenCV
Systems & Tools	Docker, Kubernetes, ROS2, AWS (EKS, MSK, Lambda, S3), GitHub Actions, Helm, Git

AWARDS

(Distinguished Winner) Apple Swift Student Challenge - Invited to WWDC 2025	2025
(Head's Prize) Charterhouse School — Highest annual academic honor	2023
(2nd Place) Lockheed Martin Code Quest (National Level)	2023
(Distinction) Canadian Euclid Competition	2022
(Gold) UKMT Senior Mathematical Challenge	2019 & 2020 & 2021
British Mathematical Olympiad (Top 1% in country for Senior Mathematical Challenge)	2021