Iva Jorgusheska

Resume

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Education

MSc (Hons) Robotics with Extended Research - The University of Manchester September 2025 - June 2027

BSc (Hons) Computer Science - The University of Manchester September 2022 – June 2025

- Achieved **First Class Honours**, with **80% average**, ranked in the **top 5% of the class**.
- **BSc Project:** *Multi-agent Reinforcement Learning for Cooperative Autonomous Navigation and Pursuit in Drone Swarms*, supervised by Prof. Wei Pan - awarded First Class.
- **Relevant Modules:** Machine Learning, Data Science, Natural Language Processing, Natural Language Understanding, Algorithms and Complexity, Computer Vision, Mathematical Topics in ML, Algorithms and Data Structures.
- Awarded a full-tuition and partial living-cost scholarship by the Government of North Macedonia.

Yahya Kemal College, Skopje, North Macedonia September 2018 – June 2022

- Macedonian State Matura (A-levels equivalent): All 5s (highest grade). Top 3.4% nationwide in Mathematics.
- Full-tuition scholarship for outstanding entrance exam results (mathematics, physics, logic).
- Recognized for excellence in mathematics and informatics competitions on National and International Level, winning multiple prestigious awards among which:
  1. National Math Olympiad: 1 second place and 2 honourable mentions.
  2. National Informatics Olympiad (C++): 1 second place and 3 third places.
  3. International Math Olympiad "Kangaroo": Awarded a silver medal.

Yale Young Global Scholars (YYGS), Innovation in Science and Technology Track July 2021

- Participated in an interdisciplinary program emphasizing innovation across fields such as robotics, biology, and technology, fostering critical thinking and exploration of diverse subjects and their integration.
- Collaborated on daily case studies and discussions with peers, enhancing research skills, innovative problem-solving, and the ability to communicate complex scientific concepts effectively.

Relevant Work Experience

Research Intern: Data-Driven Agricultural Object Detection, With Prof. Dr. Ainur Begalinova, The University of Manchester June 2024 – September 2024

- Fine-tuned pre-trained models for banana ripeness detection and explored **multimodal approaches** integrating visual and textual data. Conducted extensive **data exploration and performance analysis**, identifying key drivers of accuracy and presenting findings in structured reports to supervisors.
- Evaluated and transitioned from the ViLD open-vocabulary model to the OV-DQUO framework after systematic testing. Presented trade-offs and technical reasoning to two senior professors, leading to adoption of my proposal demonstrating adaptability, fast learning, and effective communication with experts.
- Engineered a **scalable preprocessing and data management pipeline** to clean, standardise, and label datasets, implementing reproducible 90/5/5 train-validation-test splits for robust evaluation.
- Published a curated dataset of 300+ labelled images and the preprocessing framework on GitHub, showcasing ability to **organise, structure, and share data resources** for broader use.

Data Analyst Intern (MineRL Navigation Team), With Prof. Dr. Mingfei Sun, The University of Manchester June 2023 – September 2023

- Collaborated with senior researchers to **analyze unstructured simulation data**, quickly adapting to a new research environment and contributing on par with experienced team members.
- Designed and implemented **data visualization tools** in Python (OpenCV, Matplotlib) to transform raw simulation logs into clear insights from both historical episodes and real-time agent behaviour.
- Utilized Docker and SQL-like querying of logs/configurations to manage large-scale simulations and maintain consistency across datasets.
- Customized and hosted an interactive comparison dashboard, enabling researchers to **query, explore, and compare** results from multiple agent configurations in a structured and interpretable format.

Other Research Experience

Independent Research Projects (High School) 2018 – 2020

- Conceived and led two award-winning projects: *Smart Car Exhaust Filters from Waste Clothes* and *Antimicrobial Biofilm from Rosemary*, demonstrating creativity, ability to innovate and problem-solving.
- Designed experiments, conducted **data collection and analysis in Excel** (trend detection, comparisons, statistical summaries), and authored comprehensive technical reports (20–80 pages).
- Achieved multiple international awards, including recognition at the Genius Olympiad (USA), Euroinvent (Romania), Inofair (USA), Vilipo (Lithuania), and ASEF (Albania).

Projects

Analyzing Sector Performance and Macroeconomic Indicators | *Python, Excel* February 2025

- Collected and cleaned historical data from S&P 500 sector ETFs and macroeconomic indicators (CPI, interest rates) to explore cross-sector performance trends.
- Applied statistical analysis and data visualization to detect correlations and inflection points, identifying key drivers of sector returns.
- Communicated findings through clear Excel dashboards and structured plots, mirroring the **data-driven investment research workflow**.

E-commerce Database Design and Implementation | *SQL* November - December 2023

- Designed and implemented a database for an Amazon-like system with search capabilities, product filtering, and user account management. Created an entity-relationship diagram, normalized the data model, and developed complex queries to support core e-commerce functionalities.

Natural Language Inference with Transformers and BiLSTM Models | *Python, PyTorch, HuggingFace Transformers* April 2025

- Designed a Natural Language Inference system comparing a BiLSTM model with a transformer-based approach enhanced by a novel meta-learner combining multiple transformer predictions.
- Conducted extensive evaluation using accuracy, F1-score, and confusion matrices, demonstrating superior performance and generalization of the transformer–meta-learner model.

Hackathon Winner: FlowerFy | *Google Cloud Map API, Flask, Python, JavaScript, HTML, CSS* November 2023, 30 hours

- Awarded 'Best Use of Google Cloud'. Developed an app integrating Google Maps API and machine learning for user-marked flower locations and efficient image identification using pre-trained models.

BSc Project: Multi-agent Reinforcement Learning for Cooperative Autonomous Navigation and Pursuit in Drone Swarms | *Python, PyTorch, Crazyflie 2.1, PPO, MAPPO* October 2024 – May 2025

- Designed and implemented a complete pipeline from simulation to real-world deployment on Crazyflie 2.1 drones for cooperative multi-agent pursuit tasks.
- Gained in-depth understanding of PPO and MAPPO algorithms; enhanced PPO with varying visibility and communication mechanisms to evaluate trade-offs against MAPPO in training efficiency and model complexity.
- Developed custom neural network architectures, agent behaviors, and training/testing environments; designed rendered-episode validation runs to verify policies before real-world deployment.
- Conducted extensive evaluation using metrics including collision rate, success rate, and steps-to-capture, comparing multiple model versions across repeated trials.
- Successfully transferred trained policies from simulation to physical drones, validating robustness in the real-world.

Volunteering and Extracurricular Activities

- PASS Leader, Peer Support (Sep 2024 – May 2025) – Supported first-year students academically and socially, developing leadership and facilitation skills.
- Team Guide Volunteer, 65th International Mathematical Olympiad (Jul 2024) – Provided logistical and cultural support to an international team.
- Math Olympiad Tutor (Sep 2021 – May 2022) – Taught algebra, geometry, combinatorics, and problem-solving strategies to high school students competing at the national level.
- Captain, Volleyball Team (2017–2018) – Led the team to two second-place finishes at the National Volleyball Olympiad.
- First-Year Student Representative, Data Science Society (Oct 2022 – Jun 2023) – Organized outreach initiatives and designed plans for workshops, including multiple sessions on data science applications in business, fostering student engagement and practical learning opportunities.
- High School Business Group – Led weekly meetings to analyze market trends, develop business plans, and compete for top project selection.