JOSEPH EARLY

joseph.early.ai@gmail.com
www.jearly.co.uk
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EDUCATION AND QUALIFICATIONS

The Alan Turing Institute and University of Southampton 2019 - 2023 (Ongoing)
PhD Candidate

- PhD with the Agents, Interaction, and Complexity group at the University of Southampton (UoS).
- Fully funded by The Alan Turing Institute (ATI) Doctoral Studentship.
- Researching Interpretable Multiple Instance Learning, with applications in high-resolution imaging.
- Collaborated with UoS Cancer Sciences department. Lead to an award-winning publication.
- Worked within the ATI on regulation of AI. Lead to two publications in law journals.
- Attended the Climate Change AI Summer School (2022). Lead to publications in AI for climate change.
- UoS Three Minute Thesis 2022 Finalist with *Explainable AI for High Resolution Images*.
- Reviewer for Nature Scientific Reports & Autonomous Agents and Multiagent Systems conference.
- Co-founder of the ATI's Entrepreneurship Interest Group. Hosted five events in 2021/2022.
- Student representative for the ATI 2019/20 Doctoral Cohort. Engagement with ATI Management.
- Teaching and marking for UoS undergraduate and master's modules. UoS 2021 Teaching Award winner.
- Published software (600+ downloads per month). Published articles (6000+ reads per month).
- Interviewed on the BBC World Service Digital Planet podcast discussing AI for suicide risk prevention.
- Contributed to open source software: PyTorch and PyTorch Vision.

University of Southampton 2015 - 2019
Integrated MEng Computer Science *First Class Honours, Average Grade: 83%*

Key Modules

- Computer Vision (86%)
- Machine Learning (80%)
- Simulation Modelling (92%)
- Intelligent Systems (88%)
- Programming Language Concepts (86%)
- Intelligent Agents (81%)
- Evolution of Complexity (91%)
- Deep Learning (86%)
- Reinforcement and Online Learning (86%)
- Advanced Machine Learning (74%)

- Awarded the Winton Capital Management Prize for top student in Computer Science.
- Won the Master's Group Design Project award for *Detection of Anomalies in IoT Environments* (81%).
- Completed a dissertation *Reducing Catastrophic Forgetting when Evolving Neural Networks* (81%).

KEY PUBLICATIONS

- Non-Markovian Reward Modelling from Trajectory Labels via Interpretable Multiple Instance Learning, *Neural Information Processing Systems (NeurIPS)*, 2022.
- Model Agnostic Interpretability for Multiple Instance Learning, *International Conference on Learning Representations (ICLR)*, 2022.
- Scene-to-Patch Earth Observation: Multiple Instance Learning for Land Cover Classification, *NeurIPS Workshop: Tackling Climate Change with Machine Learning*, 2022.
- Revisiting Deep Fisher Vectors: Using Fisher Information to Improve Object Classification, *British Machine Vision Conference (BMVC)*, 2022.

· A Risk-based Approach to AI Regulation: System Categorisation and Explainable AI Practices, *SCRIPTed: A Journal of Law, Technology & Society*, 2022.

· Digital Pathology and Machine Learning for Prediction of Response to Neoadjuvant Chemotherapy in Oesophageal Adenocarcinoma, *Journal of Pathology*, 2021.

· Non-Asimov Explanations Regulating AI Through Transparency, *Nordic Yearbook of Law and Informatics*, 2021.

TECHNICAL STRENGTHS

Programming	Python, PyTorch, Jupyter Notebooks, Bash, Java, C/C++, JavaScript
Software	Git, LaTeX, Google Colab, Microsoft Office, Linux OS, VirtualBox, Microsoft Azure
Techniques	Supervised Learning, Reinforcement Learning, Computer Vision, Generative Models Deep Learning, Genetic Algorithms, High Performance Computing

WORK HISTORY AND EXPERIENCE

BOON 2018 – 2019

Machine Learning Developer

· Worked for a start-up as part of the University of Southampton Future Worlds accelerator.

· Developed significant improvements to machine learning systems (50% increase in model performance).

· Heavy involvement in design and development of new systems, as well as contributing to the overall progress of the company by attending events and networking.

DSTL Group Design Project 2018 - 2019

Project Leader, Backend Engineer, and Machine Learning Developer

· Project leader (team of four) for the Group Design Project in final year of University.

· Specialised development using machine learning to detect anomalies in IoT sensor activity.

· Developed leadership skills to co-ordinate a team comprising of different specialities.

University of Southampton Summer Internship 2018

Research Assistant

· 12-week summer internship between third and fourth year of University.

· Worked in a research team developing a Responsible AI platform for Multi-UAV Coordination.

Roke Manor Research Summer Internship 2017

Full-stack Developer

· 8-week summer internship; data consolidation and web development project.

· Took an active role in project development such as organising meetings with clients.

ACM and IEEEXtreme 2016 - 2017

Competitive Programmer

· Competed in the 2017 UK and North Western European ACM programming competitions (NWERC).

· Placed first in the UK, and top 10% worldwide in 2017 IEEEXtreme 24-hour coding competition.

INTERESTS

· University of Southampton Societies 2015 - 2022
  – Engineers Rugby, Road Cycling, Chess Club, and Mountaineering Club

REFERENCES

Available upon request