Matthew Whelan

Curriculum Vitae

Education

2020– Ongoing **PhD in Computational Psychiatry**, *University of Edinburgh*, Edinburgh, UK.
Member of the UKRI Centre for Doctoral Training in Biomedical Artificial Intelligence.

2018–2020 **MPhil Neurorobotics**, *University of Sheffield*, Sheffield, UK.
Thesis title: Embodying a Computational Model of Hippocampal Replay for Robotic Reinforcement Learning

2016–2017 **MSc (Hons) Computational Intelligence and Robotics**, *University of Sheffield*, Sheffield, UK, Distinction.
Masters thesis title: A Vision Based Study on Collective Behaviour in Mammal-like Robots.

2012–2016 **BEng (Hons) Mechanical Engineering**, *Sheffield Hallam University*, Sheffield, UK, First Class Honours.
Bachelor thesis title: Automatic Torque and Speed Control of a Robotic Gripper

Academic Publications

Journal Papers

Whelan, Matthew T., Tony J. Prescott and Eleni Vasilaki. "A Robotic Model of Hippocampal Reverse Replay for Reinforcement Learning". Under review. Pre-print available at `https://arxiv.org/abs/2102.11914`.

Conference Proceedings

Whelan, Matthew T., Tony J. Prescott and Eleni Vasilaki. "Fast Reverse Replays of Recent Spatiotemporal Trajectories in a Robotic Hippocampal Model" *Conference on Biomimetic and Biohybrid Systems*. Springer, Cham, 2020.

Whelan, Matthew T., Eleni Vasilaki, and Tony J. Prescott. "Robots that Imagine – Can Hippocampal Replay Be Utilized for Robotic Mnemonics?" *Conference on Biomimetic and Biohybrid Systems*. Springer, Cham, 2019.

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Experience

Teaching and Public Engagement

2018 – 2019 **Teaching Assistant**, *Undergraduate Module in Machines and Intelligence*, University of Sheffield.

I developed a Python based GUI that aided the student's understanding of basic Computer Vision techniques, as well as provide general assistance with students and preparation of lab materials.

2017 – 2019 **Public Engagement and Outreach**, *Sheffield Robotics*, Sheffield, UK.

Public engagement on behalf of Sheffield Robotics at events such as London New Scientist Live, Manchester/Cheltenham Science Festivals and Human Brain Project Summits. I demonstrated robots and discussed current research in, and the impact and future of, robots with the public.

Vocational

Sep – Dec 2017 **Machine Learning and Robotics Developer**, *Consequential Robotics*, Bristol, UK.

Employed for a short period to bring the MSc project work into the company's software space for commercialisation. An additional computer vision feature extraction technique (HOG) with the implementation of a one-vs-one SVM multi-class classifier proved to increase the detection capability of MiRo, as well as detecting orientations for MiRo.

2014–2015 **Intern – Software Development and Project Management**, *Eaton Electric Ltd*, Manchester, UK.

Completed as part of the BEng with integrated year in industry. Work included software development and data analysis for heavy duty transmission systems and project engineering. I won the company's Student of the Year award for the work completed during the placement.

Awards and Scholarships

- Nicholson Prize for Masters Studies (MSc Best Overall Performance) (2017)
- Sheffield University Masters Scholarship (£10k) (2016)
- Student of the Year during placement year at Eaton Electric Ltd (2015)

Computer skills

Programming Languages:
- Intermediate: Python, LaTeX
- Basic: C++, C, MATLAB, Java, R, HTML/CSS, Visual Basic

Applications: Microsoft Office Suite, NI LabVIEW, MATLAB (Simulink)

OS: Linux/UNIX, Windows 7/8/10, Robot Operating System (ROS)

References

Prof. Eleni Vasilaki

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Professor of Computational Neuroscience
& Neural Engineering,
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Prof. Tony Prescott

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