MATTHEW ASHMAN

85 Furniss Avenue, Sheffield S17 3QN
(+44)7947607845 ⋄ mca39@cam.ac.uk

RESEARCH INTERESTS

I am interested in building rich probabilistic models, in particular those involving Gaussian processes, and addressing the challenges of performing approximate inference.

EDUCATION

Machine Learning and Machine Intelligence, University of Cambridge *Oct 2019 - Present*
Master of Philosophy, M.Phil.
Research Project: *Spatio-Temporal Variational Autoencoders*. Supervised by Dr. Richard Turner
Areas of Study: Advanced Machine Learning, Reinforcement Learning, Information Theory, Natural Language Processing, Intelligent System Design, Systems and Control

Distinction 80.03%

Information and Computer Engineering, University of Cambridge *Oct 2015 - Jun 2019*
Master of Engineering, M.Eng.
Research Project: *Predicting the Risk of Atrial Fibrillaation during EP studies*. Supervised by Dr. Elena Punskaya
Areas of Study: Deep Learning, Probabilistic Machine Learning, Computer Vision, Statistical Signal Analysis, Information Theory, Optimisation, Image Processing

Part IIB: Honours with Distinction 82.3%
4^{th} in Engineering
Part IIA: First Class with Distinction 83.7%
Best Information and Computer Engineering Student
Part IB: First Class 83.6%
Part IA: First Class 86.2%

PROJECTS

Spatio-Temporal Variational Autoencoders
The purpose of this project was to advance spatio-temporal dataset modelling through the establishment of a framework for the amalgamation of Gaussian processes and variational autoencoders. In carrying out with research, we introduced a novel family of VAEs for modelling spatio-temporal data - the SGP-VAE - characterised by the use of a sparse structured approximate posterior. Our approach marked the first to enable amortised inference in multi-output sparse GPs.

Predicting the Risk of Atrial Fibrillation During EP Studies
The aim of this project was to use signal processing and machine learning techniques to improve the detection of patients at risk of entering atrial fibrillation during EP studies. This was achieved successfully through the development of novel feature extraction and data augmentation techniques, with the final system identifying, and thus potentially preventing, 12 out of 14 cases of atrial fibrillation.

WORK EXPERIENCE

Prism Training and Consultancy *May 2020 -*
Consultant

· Provide statistical consultancy and software to scientists and engineers across a wide range of industries.

TTP, Cambridge *Jun - Jul 2018*
Intern

· Designed and implemented a prototype algorithm to be used in the development of a product for a major pharmaceutical company.

Prism Training and Consultancy *Jun - Aug 2017*
Software Engineer

· Built a statistical web application from scratch using C# for the back-end algorithm and a combination of JavaScript, HTML and CSS for the front-end web development. The application went live immediately after the internship.

The University of Sheffield *Jul - Sep 2016*
Research Assistant

· Worked within the Department of Electronic and Electrical Engineering, where I set up, executed and recorded measurements used to characterise semiconductor electronic device performance for radio frequency and power switching applications.

TEACHING

Engineering Supervisor, University of Cambridge *Oct 2019 - June 2020*
Responsible for providing IB Structures supervision to Engineering students within St John's College, Cambridge.

Private Tutor *May 2017 - Present*
Provide private tuition of STEM subjects for pupils studying for GCSE, A-Levels and University level examinations.

ACADEMIC AWARDS

United Steel Companies Scholarship Elected to scholarship in all four years of M.Eng. for performance in Engineering Tripos.

Wright Prize Received in all four years of M.Eng. for performance in Engineering Tripos.

Year Prize Received in 2nd, 3rd and 4th year of M.Eng. for best Engineering student in St John's College, Cambridge.

Winifred Georgina Holgate Pollard Memorial Prize Received for performance in 2nd year Engineering Tripos.

Departmental Prize Received in 3rd year of M.Eng. for excellence in Information and Computer Engineering.

TECHNICAL STRENGTHS

Machine Learning Frameworks	PyTorch, TensorFlow, GPyTorch, GPflow
Programming Languages	Python, Matlab, C++

ADDITIONAL ACTIVITIES AND SKILLS

Sport A keen sport enthusiast. I regularly run, swim, cycle and kitesurf, have represented the college rowing and rugby team and have experience swimming competitively at a national level.

Courses I completed International Relations and Computer Science courses at Georgetown University, Washington D.C.

REFEREES

Dr Adrian Weller
Ph.D. Supervisor
Engineering Department
Trumpington Street
Cambridge CB2 1PZ
Email: aw665@cam.ac.uk

Dr Richard E. Turner
Ph.D. Advisor and M.Phil. Supervisor
Engineering Department
Trumpington Street
Cambridge CB2 1PZ
Email: ret26@eng.cam.ac.uk