

JACOB DEASY

PhD Student in the Cambridge Artificial Intelligence Group

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Education

- **Magdalene College, University of Cambridge** **Cambridge, United Kingdom**
Doctor of Philosophy, Computer Science *October 2018–December 2021*
 - Google PhD Fellowship nominee and Magdalene College Bye-Fellowship nominee
 - Magdalene College graduate union President
 - **Magdalene College, University of Cambridge** **Cambridge, United Kingdom**
Master of Philosophy, Computational Biology, Distinction *October 2017–August 2018*
 - Newton College Masters Award
 - Thesis: *How Deep Reinforcement Learning Agents Solve Visual Tasks*
 - **Imperial College London** **London, United Kingdom**
Master in Science, Mathematics, 1st Class Honours *September 2013–June 2017*
 - Thesis: *The r-Hunter-Saxton Equation* (85/100)
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Experience

- **Google X** **Remote**
AI Resident *January 2021–July 2021*
 - AI lead for time series analysis and smoothing with low signal-to-noise data.
 - **Huawei Technologies R & D** **Cambridge, United Kingdom**
AI Theory Research Intern *June 2020–September 2020*
 - Led introduction of self-supervised models in speech team and contributed to core ASR framework.
 - **University of Cambridge** **Cambridge, United Kingdom**
MPhil Thesis, supervised by Prof. Stephen Eglen *June 2018–August 2018*
 - Thesis exploring how convolutional neural networks solve visual tasks using deep reinforcement learning.
 - **Imperial College London** **London, United Kingdom**
MSci Thesis, supervised by Prof. Colin Cotter *October 2016–June 2017*
 - Detailed derivation and numerical properties of a new PDE, the generalised *r*-Hunter-Saxton Equation.
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Refereed publications

1. **Jacob Deasy**, Tom McIver, Nikola Simidjievski, and Pietro Liò (2021), “ α -VAEs: Optimising variational inference by learning data-dependent divergence skew”. In *International Conference on Machine Learning* (July 2021). Selected for poster presentation.
2. **Jacob Deasy**, Nikola Simidjievski, and Pietro Liò (2020). “Constraining Variational Inference with Geometric Jensen-Shannon Divergence”. In *NeurIPS 2020*. Selected for poster presentation.
3. **Jacob Deasy**, Pietro Liò, and Ari Ercole (2020). “Dynamic survival prediction in intensive care units from heterogeneous time series without the need for variable selection or curation”. In *Nature Scientific Reports*.
4. Colin Cotter, **Jacob Deasy**, and Tristan Pryer (2020). “The *r*-Hunter-Saxton equation, smooth and singular solutions and their approximation”. In *Nonlinearity*.
5. Emma Rocheteau, **Jacob Deasy** et al. “Rapid Design and Implementation of a Data-Driven Forecast of ICU Strain from COVID-19 for Early Surge Planning in England”. In *Intensive Care Medicine Experimental* (December 2020). Selected for oral presentation.

6. **Jacob Deasy**, Alex Campbell, and Pietro Liò (2020). “Closed-form differential entropy of a multi-layer perceptron variant”. In *Mathematics of Machine Learning* (August 2020). Selected for poster presentation.
7. **Jacob Deasy**, Ari Ercole, and Pietro Liò. “Adaptive Prediction Timing for Electronic Health Records”. In *International Conference on Learning Representations* (April 2020). Selected for poster presentation.
8. **Jacob Deasy**, Pietro Liò, and Ari Ercole. “Time-Sensitive Deep Learning for ICU Outcome Prediction Without Variable Selection or Cleaning”. In *Intensive Care Medicine Experimental* (September 2019). Selected for oral presentation.

Preprints

9. **Jacob Deasy**, Nikola Simidjievski, and Pietro Liò (2021). “Heavy-tailed denoising score matching”. [arXiv preprint arXiv:2112.09788](https://arxiv.org/abs/2112.09788).
10. **Jacob Deasy**, Emma Rocheteau et al. (2020). “Forecasting Ultra-early Intensive Care Strain from COVID-19 in England”. medRxiv preprint doi: <https://doi.org/10.1101/2020.03.19.20039057>. Work featured in [University of Cambridge Research News](#) and [the Guardian](#).

Talks

1. Efficient Transformers and their applications (December 2020). *Cambridge AI Group Talks*.
2. Variational Inference with Geometric Jensen-Shannon Divergence (October 2020). *Cambridge AI Group Talks*.
3. Adaptive Prediction Timing for Electronic Health Records (April 2020). *ML-IRL, ICLR*.
4. Flexible deep learning for heterogeneous clinical time series (January 2020). *Cambridge AI Group Talks*.
5. Time-Sensitive Deep Learning for ICU Outcome Prediction Without Variable Selection or Cleaning (October 2019). *From bytes to bedside: Improving intensive care with data at ESICM LIVES 2019*.
6. Visualisation of Deep Reinforcement Learning in Artificial Intelligence (August 2018). *HPC-LEAP Conference*.

Honours & Awards

- Magdalene College Bye-Fellowship nominee *May 2020*
- Graduate President, Magdalene College, University of Cambridge *February 2019–April 2020*
- Google PhD Fellowship nominee for the University of Cambridge *2020*
- Sackler award for interdisciplinary research *October 2018*
- Sir Isaac Newton College Masters Award, awarded for an outstanding application *October 2017*
- EPSRC vacation bursary for undergraduate research *June 2016*

Languages & Technologies

Programming Languages: C++, Fortran 90, L^AT_EX, MATLAB/Octave, Python, R

Deep Learning Libraries: Apex, Horovod, JAX, Keras, PyTorch, Tensorflow

Technologies: Bash, git, Matplotlib, NumPy, Pandas, scikit-learn, SciPy, statsmodels, UNIX

Natural Languages: English (native), French (B2–C1), Mandarin (A1)

Professional activities

Teaching

- **Course supervisor:** Artificial intelligence (CS Part IB), Bioinformatics (CS Part II), Machine Learning and Bayesian Inference (CS Part II)
- **Master’s co-supervisor:** Physics Part III student: “*Visualising the loss landscape of neural networks*”, Physics Part III student: “*Applications of Geometric Jensen-Shannon Divergence*”

Reviewing

- **Journals:** Computer Modelling in Engineering & Sciences, Proceedings of the National Academy of Sciences
- **Conferences:** NeurIPS 2021, ICML 2021, ACM CHIL 2020, Oxbridge Women in Computer Science 2020
- **Workshops:** ML4H 2020, ML4H 2019