TIM PEARCE

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Cambridge, UK

OVERVIEW

- PhD at Cambridge → Postdoc at Tsinghua → Researcher at Microsoft Research
- Publications: NeurIPS, ICML, ICLR, AISTATS, UAI, AAAI, IEEE CoG (Best Paper). 800+ citations.
- Research areas: Artificial intelligence, imitation learning, generative modelling, uncertainty, robustness, reinforcement learning, deep learning theory.

EDUCATION

2016 – 2020 University of Cambridge, PhD in Engineering (Machine Learning)

- One-year exchange fellowship at the Alan Turing Institute (UK's center for AI & data science).
- Lectured, supervised and demonstrated for nine undergraduate and postgraduate courses.

2015 – 2016 National Taiwan University, 台湾大学

- Taiwan's MOE scholarship for intensive full time Mandarin study.

2006 – 2010 Durham University, M.Eng. Engineering, First-class Honors

- Result: Ranked top 2% of class [3/130 students], final grade 77%.
- Courses covered electronic & mechanical engineering syllabus.
- Master's thesis: Artificial intelligence for music generation using genetic algorithms.

EMPLOYMENT

May 2022 – present Researcher, Microsoft Research, Cambridge

- Reinforcement learning and generative modelling for games. Team lead: Katja Hofmann.
- Transformers. Diffusion models. Large-scale training 100+ GPUs.
- Learning from human demonstrations at mass-scale.
- World modelling in complex 3D environments from pixels.
- Python (PyTorch, Tensorflow, PyMC, Scikit-Learn), R, Git, Azure, Docker.

Nov 2020 – May 2022 Postdoctoral Fellowship, Tsinghua University, 清华大学 (14th QS ranking)

- Awarded 'Global Talents Fellowship' award to carry out independent research agenda.
- Supervised by Prof. Jun Zhu, in the Tsinghua Statistical AI and Learning Group (TSAIL).

Jun 2020 – Aug 2020 Machine Learning Internship, NASA Research Accelerator (FDL)

- Unsupervised and causal models capturing effect of pollutants on cloud formation.

Mar 2019 – Jun 2019 Reinforcement Learning Internship, PROWLER.io / Secondmind

- Model-based RL with probabilistic dynamics models for robotic control tasks.

Oct 2011 – Sep 2015 Financial Modelling, EY (Ernst & Young)

- Qualified as a Chartered Accountant (CA) – 8 months of full time study: finance, tax, business systems.
- Built calculation engines and automation systems, in VBA, SQL, advanced Excel and Access.
- Created price optimization models for interest rates using clustering and regression analysis.
- Options valuation methods (Monte Carlo, Black-Scholes, Binomial model).
- Audited private equity, insurance, and algorithmic trading funds.

OTHER

- Chinese Mandarin (HSK 4-5).
- Captained table tennis teams in Cambridgeshire local-league 2021-23. Cambridge University table tennis club treasurer 2018-20.

ACADEMIC SERVICE: REVIEWING

- NeurIPS 2020, 21, 22, 23
- ICML 2020, 21, 22, 23
- ICLR 24
- AISTATS 2019, 20
- IEEE TNNLS 2019
- ICRA 2024

ACADEMIC SERVICE: ORGANIZING

- Local chair, International Summer School on AI and Games 2023
- Co-organizer, Workshop on Computer Vision & Games, BMCV 2023
- Program committee, NeurIPS Workshop - Bayesian Deep Learning 2019, 21
- Program committee, ICML Workshop - Uncertainty & Robustness in Deep Learning 2020

TEACHING

Lecturer

- 2019-22 Intro to Deep Learning MPhil engineering, Data and Modelling
- 2019-20 Intro to Deep Learning 4th yr engineering, Industrial Operations Mgmt

Tutor – Teaching groups of 3-5 students (Oxbridge speak: 'supervisions')

- 2018-20 Foundations of Data Science 2nd yr undergrad Computer Science
- 2018-20 Artificial Intelligence 2nd yr undergrad Computer Science
- 2018-19 Foundations of Computer Science 1st yr undergrad Computer Science
- 2017-19 Quantitative Methods Management MPhil
- 2019-20 Statistical Signal Processing 3rd yr Information Engineering

Lab Demonstrator

- 2017-18 Intro to machine & assembly code 1st yr engineering
- 2018-19 Intro to robotics 1st yr engineering

Master's Thesis

- 2018-19, David Ratiney, Uncertainty in Neural Networks: Application to supply chain forecasting

SELECTED PUBLICATIONS

-- Link to Google Scholar --

- E Alonso, A Jelley, **T Pearce**
  Diffusion World Models
  Under review 2023

- **Alphabetical order**. A Kanervisto, D Bignell, G Gupta, R Georgescu, S Devlin, S Valcarcel Macua, S Zheng Tan, T Rashid, **T Pearce**, T Gupta, U Arora, Y Cao, A Shaw, G Costello, K Hofmann
  WHAM! World and Human Action Modelling in a Modern Xbox Game
  Under review 2023

- **T Pearce**, T Rashid, A Kanervisto, D Bignell, M Sun, R Georgescu, SV Macua, SZ Tan, I Momennejad, K Hofmann, S Devlin
  Imitating Human Behaviour with Diffusion Models
  ICLR 2023

- **T Pearce**, JH Jeong, Y Jia, J Zhu
  Censored Quantile Regression Neural Networks for Distribution-Free Survival Analysis
  NeurIPS 2022 (Oral)
- F Lin*, S Huang*, **T Pearce**, W Chen, W-W Tu
  TiZero: Mastering Multi-Agent Football with Curriculum Learning and Self-Play
  AAMAS 2023
- **T Pearce**, J Zhu
  Counter-Strike Deathmatch with Large-Scale Behavioural Cloning
  IEEE Conference on Games 2022 (Best Paper Award)
- **T Pearce**, A Brintrup, J Zhu
  Understanding Softmax Confidence and Uncertainty
  ArXiv 2021
- **T Pearce**, F Leibfried, M Zaki, A Brintrup, A Neely
  Uncertainty in Neural Networks: Approximately Bayesian Ensembling
  AISTATS 2020
- R Tsuchida, **T Pearce**, C Van Der Heide, F Roosta, M Gallagher
  Avoiding Kernel Fixed Points: Computing with ELU and GELU Infinite Networks
  AAAI 2021
- **T Pearce**, R Tsuchida, M Zaki, A Brintrup, A Neely
  Expressive Priors in Bayesian Neural Networks: Kernel Combinations and Periodic Functions
  UAI 2019
- **T Pearce**, R Tsuchida, M Zaki, A Brintrup, A Neely
  High-Quality Prediction Intervals for Deep Learning: A Distribution-Free, Ensembled Approach
  ICML 2018