Samuel A. Barnett

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Education

- **Princeton University** — Princeton, NJ
  PhD candidate, MA, Dept. of Computer Science; Daniel M. Sachs Scholar — *Sep. 2018 – May 2024*
- **University of Oxford** — Oxford, UK
  MMathPhil and BA; First Class (equiv. to 4.00 GPA); Avg. Mark: 79 — *Oct. 2014 – Jul. 2018*

Work Experience

- **Rosemark** — Princeton, NJ
  Machine Learning Research Scientist — *Mar. 2022 - Dec. 2022*
  - **Consulting**: Developed efficient probabilistic clustering and classification methods for client segmentations.
- **Microsoft Research** — New York, NY
  Machine Learning Intern — *Jun. 2021 - Sep. 2021*
  - **Reinforcement Learning Research**: Supervised by Dr. Ida Momennejad, developed a novel reinforcement learning algorithm with applications in artificial intelligence and cognitive neuroscience.
  - **Open-source Software**: Contributed to the development of an open-source library for neurally plausible reinforcement learning.
- **Mathematical Institute** — Oxford, UK
  Summer Researcher — *Jul. 2017 – Aug. 2017*
  - **Machine Learning**: Produced a Python package to perform classification tasks on sequentially ordered data (e.g. multivariate time series), based on the research of my supervisor, Prof. Harald Oberhauser.

Papers

- **Barnett, S.A.**, Aduol, J., Guerra, A., Gumussoy, S., and Adams, R.P., in submission. Toeplitz posterior approximation for multivariate time series modeling with Gaussian processes.
- **Barnett, S.A.**, Griffiths, T.L. and Hawkins, R.D., 2022. A pragmatic account of the weak evidence effect. *Open Mind, 6, pp.169-182.*
- **Barnett, S.A.** and Momennejad, I., 2022. PARSR: Priority-Adjusted Replay for Successor Representations. *Reinforcement Learning and Decision Making (RLDM 2022), pp.80-85.*
- Juliani, A., **Barnett, S.**, Davis, B., Sereno, M. and Momennejad, I., 2022. Neuro-Nav: A Library for Neurally-Plausible Reinforcement Learning. *Reinforcement Learning and Decision Making (RLDM 2022), pp.290-294.*
- **Barnett, S.A.**, 2018. Convergence problems with generative adversarial networks (GANS). *arXiv preprint arXiv:1806.11382.*
- **Barnett, S.A.**, 2018. What decision theory provides the best procedure for identifying the best action available to a given artificially intelligent system?. *Dissertation, University of Oxford.*

Invited Talks

- **Modelling Agency Formally** — Seattle, WA
  Measuring Cooperation with Counterfactual Planning — *Oct 2023*
- **Robotics Seminar** — University of Oxford
  Toeplitz posterior approximation for multivariate time series modeling with Gaussian processes — *June 2023*
- **Institute for Data-Driven Dynamical Design** — Princeton University
  Efficient Time Series Modelling with Semiparametric Latent Factor Models — *October 2022*
- **CogSci** — Toronto, Canada
  Priority-Adjusted Replay for Successor Representations — *July 2022*
- **Agency, Directionality, and Function Conference** — San Antonio, TX
  Emergent Intrinsic Motivations in Intelligent Collectives — *March 2022*

Scholarships and Grants

- **Agency, Directionality, and Function** — Templeton Foundation
  Different objectives, but a single goal: emergent intrinsic motivations in intelligent collectives — *2021–*
- **Daniel M. Sachs Scholarship at Princeton** — Princeton University
  One year of study at Princeton University's Graduate School — *2018–2019*

Teaching Experience

- **COS 324** — Princeton University
  Introduction to Machine Learning — *Fall 2020 - Spring 2021*

Awards

- **Part B Gibbs Prize**: Highest mark in third-year Mathematics and Philosophy (Philosophy papers).
- **Faculty of Philosophy Prize**: Highest mark in Prelims Mathematics and Philosophy (Philosophy papers).
- **Scholarship at Worcester College**: Received for performance in Prelims examinations.

Programming Skills

- **Languages**: Python, JavaScript, and WebPPL.
- **Machine Learning Frameworks**: JAX, PyTorch, and scikit-learn.