# Tom George

PhD candidate in ML and theoretical neuroscience,
also building open-source software for science
**Cambridge | Harvard | UCL | Google**

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## EDUCATION

**PhD, Sainsbury Wellcome Centre, UCL** | Advisors: Prof. Claudia Clopath (Imperial), Dr. Kimberley Stachenfeld (DeepMind/Columbia) and Prof. Caswell Barry (UCL). Member of **Google DeepMind NeuroLab**. 2020–25

**Herchel Smith Scholarship, Harvard University** | Prestigious and fully funded scholarship to study at Harvard. Advisors: Prof. Cengiz Pehlevan & Prof. Sam Gershman 2019–20

**BA, MA & MSci, Physics (Natural Sciences), University of Cambridge** 2015–19
1st Class (Part III), 1st Class (Part II), 1st Class (Part I)

## AWARDS

**UCL Early Career Neuroscience Prize** | Junior category 2023
**Herchel Smith Scholarship** | to Harvard, awarded by Emmanuel College Cambridge 2019
**Emmanuel Senior Scholarship and John Mainhood Prize** | for academic achievement 2016-18

## SOFTWARE

**RatInABox** | Creator and maintainer of a popular python package for generation of motion and neural data in spatial environments (*>55,000 PyPI downloads*). Link. 2022
**SIMPL** | Open-source package for neural latent data analysis. Link. 2024

## INDUSTRY

**X AI Residency, Google** | Foundation models for geophysics. Mountain View, California. 2025
**ML consultant, Mltpl** | ML tools for automated business valuations 2023-24

## TECHNICAL SKILLS

**Programming** | Python (very proficient inc. Jax), bash, Julia [github.com/TomGeorge1234].
**Machine Learning** | NLPs, ANNs, CNNs, RNNs, generative models (PyTorch, tensorflow).
**Languages** | English (Native), Spanish (DELE B1 equivalent).

## TEACHING & OUTREACH

**TReND-CaMinA** | Co-founder and organizer of a neuroscience and ML summer school in Africa. Secured >$150,000 funding. (Ghana 2023, Rwanda 2024, Zambia 2025, Senegal 2026) 2023-26

**NeuroAI summer school** | University of Amsterdam, invited lecturer on model-free RL. 2024

## ACADEMIC PLACEMENTS

**Caltech** | Summer Undergraduate Research Fellow, Prof. A. Thompson 2018
**Okinawa Computational Neuroscience Course (OCNC)** | Summer school participant 2022
**Okinawa Institute of Science and Technology (OIST)** | Research intern with Prof. Tomoki Fukai 2022

## SELECTED INVITED TALKS

**Oxford University, Cortex Club** | RatInABox (see open source). 2024
**Google DeepMind, London** | Optimizing internal representations (NeuroLab workshop)
**Imperial, Pint of Science** | Public outreach talk on "The language of the brain"
**ICLR TinyPapers workshop oral** | Neural oscillations and eligibility traces, Kigali, Rwanda 2023
**Google DeepMind, London** | The Helmholtz hippocampus (NeuroLab workshop)
**UCL Neuroscience Symposium (prize winner)** | How hippocampus learns predictive maps?
**Spring Hippocampal Research Conference, Verona** | RatInABox (see open source).
**MILA Neural-AI reading group** | Biological Reinforcement Learning in the Hippocampus. 2022

## SELECTED PUBLICATIONS

**T. M. George** (2025). SIMPL: Scalable and hassle-free optimisation of neural representations from behaviour. *International Conference on Learning Representations (**ICLR**)*

**T. M. George** (2023). A generative model of the hippocampal formation trained with theta driven local learning rules. *Advances in Neural Information Processing Systems (**NeurIPS**)*

E. Thompson, …, **T. M. George** et al. (2024) Replay of procedural experience is independent of the hippocampus. *(Under review at **Nature**)*

**T. M. George** (2023). Theta sequences as eligibility traces: A biological solution to credit assignment. *Tiny Papers Track at **ICLR** 2023, Kigali, Rwanda. Paper (accepted for oral pres.)*

**T. M. George**, M. Rastogi, W. de Cothi, C. Clopath, K. Stachenfeld, & C. Barry (2024). RatInABox: An open source toolkit for modelling locomotion and neuronal activity in continuous environments. eLife

**T. M. George***, W. de Cothi*, K. Stachenfeld, & C. Barry (2022). Rapid learning of predictive maps with STDP and theta phase precession. *eLife*.

**T. M George**, G. E. Manucharyan, & A. F. Thompson (2021). Deep learning to infer eddy heat fluxes from sea surface height patterns of mesoscale turbulence. *Nature Communications.*

**T. M. George** & P. Liò (2019). Unsupervised Machine Learning for Data Encoding applied to Ovarian Cancer Transcriptomes. *bioRxiv*.

## REVIEWING

**Area chair, ICLR 2023 and 2024** | TinyPapers workshop
**Reviewer, NeurIPS 2023**| Associative Memory & Hopfield Networks workshop

## CONFERENCE POSTERS ETC.

COSYNE 2024 poster: C. Barry, M. Rastogi, W. de Cothi, C. Clopath, K. Stachhenfeld, **T. M. George** (2024) RatInABox: A unified Python framework for modelling spatial behaviour and neural data

COSYNE 2024 poster: **T. M. George**, C. Barry, K. Stachenfeld, C. Clopath, T. Fukai (2024) The Helmholtz Hippocampus: A biologically plausible generative model of the Hippocampal formation

NeurIPs 2023 poster: **T. M. George**, C. Barry, K. Stachenfeld, C. Clopath, T. Fukai (2024) The Helmholtz Hippocampus: A biologically plausible generative model of the Hippocampal formation

COSYNE 2024 poster: **T. M. George**, W. de Cothi, K. Stachenfeld, C. Barry (2022). Rapid learning of predictive maps with STDP and theta phase precession.

SFN 2022 poster & Cosyne 2023 Talk: E. Thompson, L. Rollik, **T. M. George*** et al., Replay of motor sequences in DLS during consolidation using an unsupervised point process model.

SFN 2021 poster: A. Onih, **T. M. George**, S. Nierwetberg & A. Akrami. Pupil dilation as a proxy for statistical learning in freely moving mice and humans.

Reservoir networks for unsupervised statistical learning (2021) (Github https://tinyurl.com/3mmpjj6r). Advisors: Dr. Athena Akrami & Prof. Claudia Clopath

Pupillometry protocol and pipeline for studying temporal structure learning in humans (2021) (Github, https://tinyurl.com/2nr4c72t). Advisors: Dr. Athena Akrami & Prof. Claudia Clopath

Deep learning to explain mixed selectivity of neurons in the prefrontal cortex (2020) ( https://tinyurl.com/2p8zdd8w). Advisor: Prof. Cengiz Pehlevan & Prof. Sam Gershman