

Zafeirios Fountas

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About me

Research Scientist specialising in brain-inspired AI. Over 10 years of experience building and leading research teams at the intersection of machine learning and neuroscience. Deeply driven by the potential of artificial general intelligence for societal advancement and understanding human cognition, I develop novel architectures for self-motivated RL, scalable episodic memory, and reasoning in LLMs and other foundational models.

Work and Research Experience

Huawei technologies

London, UK

PRINCIPAL RESEARCH SCIENTIST AND GROUP LEADER

Nov 2020 - present

- Leading research on long memory in large generative models (incl. LLMs/VLMs), intrinsic motivation and cognition-inspired AI, Noah's Ark Lab.
- Senior member of Huawei's **global CS research grants committee**, shaping AI research strategy through multimillion-dollar funding decisions.
- Developed EM-LLM (ICLR 2025) achieving **10M token context** on single V100, outperforming SOTA (full-context & RAG) without fine-tuning.
- Built and led a 10-person research team on unsupervised reinforcement learning and brain-inspired generative modelling (2020-2023).
- Hands-on research resulted in successful patent submissions, academic papers in top-tier venues, with significant potential for products.
- Recruited and led **>30 researchers** in total, across different levels of seniority and disciplines including Prof. Karl Friston.
- Orchestrated collaborations with industry and academic leaders, and organised key academic workshops.

Wellcome Centre for Human Neuroimaging, UCL

London, UK

HONORARY RESEARCH FELLOW

Nov 2018 - Jan 2021

- Research on amortised variational inference, deep active inference agents, episodic memory, representation learning and mental health care.
- Working with Prof. Karl Friston, Dr. Vladimir Litvak and Prof. Nadia Berthouze and co-authoring grant proposals.
- MSc thesis supervision, Department of Computer Science (19 students).

Emotech LTD

London, UK

RESEARCH SCIENTIST, FOUNDING MEMBER

Jun 2015 - Nov 2020

- Led the end-to-end AI development of the personal robot 'Olly', including novel systems for human personality estimation and mimicry, directly contributing to securing **\$10M+** in Series A funding and **4 CES 2017 Innovation Awards**.
- Led project coordination for two multi-partner EU consortiums in AI-driven mental healthcare.

School of Design, Royal College of Art

London, UK

VISITING LECTURER

Nov 2018 - Sep 2019

- Lectures on brain-inspired machine learning.
- Part-time employment by both RCA and the Dyson School of Design Engineering, Imperial College London.

Department of Computing, Imperial College London

London, UK

RESEARCH ASSOCIATE

Apr 2016 - Aug 2018

- Acting as Imperial College's Principal Investigator for the six-partner EU (Horizon2020) project "TimeStorm".
- Research on human time perception, deep neural networks, predictive coding and episodic memory recall.

TEACHING ASSISTANT

Apr 2011 - Mar 2016

- Courses: Computational neurodynamics (5 years), introduction to AI (3 years), integrated programming lab (C++, Prolog, Assembly – 3 years).
- Supervision: Software engineering practice projects (16 students), MSc Thesis (3 students).

VISITOR RESEARCHER, COMPUTATIONAL NEURODYNAMICS GROUP

Sep 2010 - Mar 2011

- Research on large-scale neural cognitive systems with human-like behaviour.

Pandora Robotics

Thessaloniki, Greece

CO-FOUNDER, DEVELOPER, TEAM LEADER

Sep 2006 - Sep 2010

- Leading the design of the AI and robotic arms in 3 autonomous mobile rescue robots for the RoboCup World Championships (2007-2009).

Education

Imperial College London

London, UK

PHD IN COMPUTATIONAL NEUROSCIENCE

2016

- Department of Computing
- Title: "Action selection in the rhythmic brain: The role of the basal ganglia and tremor"
- Supervisor: Prof. Murray Shanahan

Imperial College London

London, UK

MSc IN COMPUTING SCIENCE (DISTINCTION)

2011

- Thesis: "Spiking Neural Networks for Human-like Avatar Control in a Simulated Environment" (Awarded Distinguished Status)

- Senior Thesis Project: "Approaching the solution of the Eternity II puzzle"

Selected Publications

- A. Omerjee, **Z. Fountas**, et al., "Bottlenecked Transformers: Periodic KV Cache Consolidation for Generalised Reasoning" ICLR, 2026.
- **Z. Fountas**, et al., "Human-inspired Episodic Memory for Infinite Context LLMs." ICLR, 2025.
- U. Zahid, Q. Guo, **Z. Fountas**, "Sample as You Infer: Predictive Coding With Langevin Dynamics." ICML, 2024.
- A. Zakharov, Q. Guo, **Z. Fountas**, "Variational Predictive Routing with Nested Subjective Timescales", ICLR, 2022.
- **Z. Fountas**, A. Sylaidi, K. Nikiforou, A. Seth, M. Shanahan, and W. Roseboom, "A Predictive Processing Model of Episodic Memory and Time Perception", Neural Computation 34.7, 2022.
- A. Loffler, A. Sylaidi, **Z. Fountas**, P. Haggard, "Two Ways to Change Your Mind: Effects of Intentional Strength and Motor Costs on Changes of Intention." , Nature Communications 12.1, 2021.
- **Z. Fountas**, N. Sajid, P. A.M. Mediano and K. Friston, "Deep active inference agents using Monte-Carlo methods", NeurIPS, 2020.
- W. Roseboom, **Z. Fountas**, K. Nikiforou, D. Bhowmik, M. Shanahan, A. Seth, "Activity in perceptual classification networks as a basis for human subjective time perception.", Nature Communications 10.1, 2019.
- D. Gamez, **Z. Fountas**, A.K. Fidjeland, "A Neurally Controlled Computer Game Avatar With Human-like Behavior", IEEE Transactions on Computational Intelligence and AI in Games, 5.1, 2013.

Awards - Scholarships

- **4 x CES 2017 Innovation Awards** (smart home, drones and unmanned systems, home appliances, home audio-video accessories), for the personal robot Olly, as the lead in AI, Las Vegas, January 2017. To date, highest number of CES awards given to a single start-up or product.
- Google Europe Scholarship for Students with Disabilities (Dyslexia) 2014
- Shortlisted for the Best Graduate Teaching Assistant Award, Student Academic Choice Awards 2014 Imperial College London (6 in 600 nominees).
- Best 1st year PhD project, DoC Google Poster Competition 2013, Imperial College London
- EPSRC Doctoral Training Account (DTA) Studentship for PhD in Computing at Imperial College London (2012-2015).
- Distinguished project status for MSc thesis, Imperial College London 2011
- Prize of Excellence and Innovation 2009. Best student participation in international competitions. Selected by the research committee of the Aristotle University of Thessaloniki, November 2010
- "Best paper (demo session) prize", 3rd National Convention of Electrical and Computer Engineering Students, Thessaloniki, April 2009.
- "Best paper (demo session) prize", 2nd National Convention of Electrical and Computer Engineering Students, Athens, April 2008.
- State Scholarships Foundation's scholarship holder in the frame of the LLP/Erasmus Programme.

International Competitions

IEEE CONFERENCE ON COMPUTATIONAL INTELLIGENCE AND GAMES, SEOUL, SOUTH KOREA.

08/2011

- 2K BotPrize 2011, a Turing test for AI bots. (*2nd best score in the history of the competition until 2011*).

13TH ROBOCUP WORLD CHAMPIONSHIP AND SYMPOSIUM, GRAZ, AUSTRIA.

06/2009

- Rescue Robot League (*best European participation*).

Professional Service

- Area Chair: NeurIPS, ICLR
- Regular reviewer for the top-tier machine learning conferences: NeurIPS, ICLR, ICML
- Journal reviewer: Nature Human Behaviour, Trends in Cognitive Sciences, eLife, IEEE Access.

Technical tools I frequently use

MACHINE LEARNING

- PyTorch, TensorFlow, familiar with MindSpore and JAX and in the past keras, scikit-learn, Caffe, OpenCV.

GENERIC CODING (PROTOTYPING)

- Python, C/C++, Qt framework, Javascript, Prolog, Mathematica and in the past CUDA, gRPC, Android SDK and SolidWorks.

COMPUTATIONAL NEUROSCIENCE

- Broad experience in various simulation tools including Brian (2&1), NeuroML, NEURON, NeMo and Brain Studio.

ROBOTICS

- Past experience in libraries MRPT/pymrpt, ROS and Webots.