Silvia Sapora

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Summary

I am currently pursuing a PhD in Statistics at the University of Oxford, where my research focuses on **Reinforcement Learning**, **Meta-Learning**, and **Large Language Models**. With a strong foundation in applied machine learning from my tenure at Meta, I aim to advance the field through innovative research and practical applications.

Education

University of Oxford Oct 2022 – Ongoing
PhD in Statistics, supervised by Yee Whye Teh and Jakob Foerster *Oxford, UK*

Imperial College London Oct 2015 – June 2019
Master of Engineering in Computer Science (incl. Bachelor) *London, UK*

- First Class, Dean's List (top 10% of the year)

Work Experience

Machine Learning Research Intern Apr 2025 – Sept 2025
Apple *London, UK*

- Developed a novel framework combining LLMs and evolutionary strategies to improve Inverse Reinforcement Learning techniques. Authored a research paper on the findings accepted to ICLR 2026.

Teaching Assistant Oct 2022 – Apr 2025
University of Oxford, Imperial College London *London, UK*

- Courses: Applied Probability, Statistical Machine Learning, Deep Learning

Machine Learning Research Intern Jun 2024 – Feb 2025
SamayaAI *London, UK*

- Improved Information Retrieval methods using Large Language Models.

Software Engineer Aug 2019 – Oct 2022
Meta *London, UK*

- Specialized in **applied machine learning** to enhance Meta's developer infrastructure.
- Worked on identifying relevant data, building data pipelines, data cleaning and model optimisation.
- Co-authored and published multiple papers on novel approaches to improving reliability, integrity, and privacy in developer systems.

Software Engineering Intern Apr 2018 – Sep 2018
Meta *London, UK*

Software Engineering Intern Jun 2017 – Sep 2017
Redgate Software *Cambridge, UK*

- Implemented a Machine Learning Anomaly Detection model to detect anomalies in metrics such as CPU and memory usage and presented the feature in a company-wide meeting.

Teacher Jan 2016 – Jun 2019
Turing Lab *London, UK*

- Taught kids aged 8-16 the basics of coding using Scratch, JavaScript and Python.

Research

• Sapora S., Hjelm D., Toshev A., Mazoure B., GRACE: A Language Model Framework for Explainable Inverse Reinforcement Learning, preprint: arXiv:2510.02180, *14th International Conference on Learning Representations (ICLR), 2026*

• Cook J.*, Sapora S.*, Ahmadian A., Khan A., Rocktäschel T., Foerster J., Ruis L., Programming by Backprop: LLMs Acquire Reusable Algorithmic Abstractions During Code Training, arXiv preprint: arXiv:2506.18777, *14th International Conference on Learning Representations (ICLR), 2026, *equal contributions*.

• Alfano C.*, Sapora S.*, Foerster J., Rebeschini P., Teh Y.W., Meta-Learning Objectives for Preference Optimization, 39th Conference on Neural Information Processing Systems (NeurIPS 2025), **equal contributions*.

• Sapora S., Baziotis C., Dessi R., Petroni P., Bevilacqua M. QCR: Quantised Codebooks for Retrieval, *under review*.

• Sapora S., Swamy G., Lu C., Teh Y.W., Foerster J. EvIL: Evolution Strategies for Generalisable Imitation Learning, *Proceedings of the 41 st International Conference on Machine Learning, Vienna, Austria. PMLR 235, 2024*.

• DeMoss B., Sapora S., Foerster J. Hawes N., Posner I. The Complexity Dynamics of Grokking, Physica D: Nonlinear Phenomena

• Alfano C., Towers S., Sapora S., Lu C., Rebeschini P. Meta-learning the mirror map in policy mirror descent, Proceedings of the 13th International Conference on Learning Representations, 2025

• Nagy P., Frey S., Sapora S., Li K., Calinescu A., Zohren S., Foerster J. Generative AI for End-to-End Limit Order Book Modelling: A Token-Level Autoregressive Generative Model of Message Flow Using a Deep State Space Network, *Proceedings of the Fourth ACM International Conference on AI in Finance, 91-99, 2023*

• Frey S., Li K., Nagy P., Sapora S., Zohren S., Foerster J., Calinescu A. JAX-LOB: A GPU-Accelerated limit order book simulator to unlock large scale reinforcement learning for trading, *Proceedings of the Fourth ACM International Conference on AI in Finance, 583-591, 2023*

• Ahlgren J. et al. Behavioural and structural imitation models in Facebook's WW simulation system, *9th International Workshop on Realizing Artificial Intelligence Synergies in Software Engineering (RAISE 2021)*

• Bojarczuk K. et al. Measurement challenges for cyber cyber digital twins: Experiences from the deployment of Facebook's ww simulation system, *Proceedings of the 15th ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM), 2021*

• Ahlgren J. et al. Facebook's cyber–cyber and cyber–physical digital twins, *Proceedings of the 25th International Conference on Evaluation and Assessment in Software Engineering, 2021*

• Ahlgren J. et al. Testing web enabled simulation at scale using metamorphic testing, *IEEE/ACM 43rd International Conference on Software Engineering: Software Engineering in Practice (ICSE-SEIP), 2021*

• Ahlgren J. et al. Ownership at large: Open problems and challenges in ownership management, *Proceedings of the 28th International Conference on Program Comprehension, 2020*

• Ahlgren J. et al. WES: Agent-based user interaction simulation on real infrastructure, *Proceedings of the IEEE/ACM 42nd International Conference on Software Engineering Workshops, 2020*

• Sapora S. Grasp Quality Deep Neural Networks for Robotic Object Grasping, Master's Thesis, 2019

• Sapora S., Lazarescu B., Lolov C. Absit invidia verbo: Comparing deep learning methods for offensive language, arXiv preprint: arXiv:1903.05929, 2019

Selected Talks

• **Behavioural and structural imitation models in Facebook's WW simulation system**, International AI for Agent-Based Modelling Community Meeting, April 2022

• **AI Techniques for Simulating Behaviour using Facebook's WW Social Media Simulation System**, 9th workshop on Realising Artificial Intelligence Synergies with Software Engineering, November 2021

• **Ownership at Large - Open Problems and Challenges in Ownership Management**, 28th International Conference on Program Comprehension, 2021 [link]

• **WES: Agent-based User Interaction Simulation on Real infrastructure**, Facebook, London Tech Talks, for an audience of 500+, December 2019 and London Tech Summit, November 2019

• **Grasp Quality Deep Neural Networks for Robotic Object Grasping**, Imperial College London, Undergraduate Open Day, for an audience of 200+, July 2019 and for the Industry Partners Open Day, July 2019

Technical Skills

Programming Languages: Python, Hack, C++, C, JavaScript, Go, Haskell, SQL

Deep Learning Frameworks: JAX, PyTorch, TensorFlow, Keras

Libraries & Tools: NumPy, Pandas, Scikit-learn, Git, Docker

Scholarships and Awards

- **Best Academic Paper Award at ICAIF'23**: for the paper JAX-LOB: A GPU-Accelerated limit order book simulator to unlock large scale reinforcement learning for trading
- **EPSRC DTP Scholarship**: PhD funding for 4 years
- **Corporate Partnership Programme Award**: Outstanding Master's Thesis
- **Distinguished Status Award**: Outstanding Master's Thesis
- **HackCambridge MLH Hackathon**: 2nd place overall (100+ teams)
- **Imperial College Hackatho**: 1st place, Best WebApp (100+ teams) 2nd place, Best Game (100+ teams)
- **Department of Computing Corporate Partnership Program**: Outstanding 1st year project