Julian Coda-Forno

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Languages: French (native) | Spanish (native) | English (fluent)

Research Interests

Large Language Models; Meta-Learning; Cognitive Science; Deep Learning; In-context Learning; Reinforcement-Learning; Decision-making; Mechanistic Interpretability

Education

ELLIS: Helmholtz AI/LMU & Google DeepMind — **Munich & London**
PhD in Machine learning — *2022–Present*
Supervisors: Dr Eric Schulz (Helmholtz AI/LMU) & Dr Jane X. Wang (Google DeepMind)
Topic: LLMs' behaviour and decision-making from a cognitive science perspective

University College London (UCL) — **London, UK**
MS.c in Data Science & Machine Learning, Distinction (82.6%) with Dean's List — *2020–2021*
Supervisors: Prof Neil Burgess (UCL) & Dr Zafeirios Fountas (Huawei)
Title: "Leveraging episodic memory in model-based RL"

University of Manchester — **Manchester, UK**
BEng Aerospace Engineering, First class Honours — *2015–2019*

Experience

Huawei — **London, UK**
Visiting Research intern (10 months) — *2021–2022*
Collaborated with Huawei Neuromorphic Computing Group for my UCL Master's research thesis and pursued the research further. Investigated how the neuroscience concept of episodic memory could be used in model-based reinforcement learning for more sample efficiency in complex tasks and environments.
Accepted paper at MemARI (2022 NeurIPS workshop)

Rolls-Royce Plc — **Birmingham, UK**
Software Engineering Intern (12 months) — *2018–2019*

Supervision

Natalia Scharfenberg: Osnabrück University, Master Thesis: "LLM's representations for RL" *2023*

Awards

Dean's List: top 5% of student achievement within the faculty of Engineering *2021*
Distinctions of the jury: 14th French Olympiads of mathematics - Nice Academy *2014*

Summer schools

MIT Brains, Minds & Machines Summer Course: Woods Hole, USA *2023*

Invited talks

Harvard Efficient-ML seminar series
"Rising star speaker" - Tutorial on meta-learning in deep neural networks *2024*

Reviewing

Conference on Neural Information Processing Systems (NeurIPS) 2023

Research papers

[1] **Julian Coda-Forno**, Marcel Binz, Jane X. Wang, and Eric Schulz. Cogbench: a large language model walks into a psychology lab. *International Conference on Machine Learning (ICML)*, 2024.

[2] Akshay K. Jagadish, **Julian Coda-Forno**, Mirko Thalmann, Eric Schulz, and Marcel Binz. Ecologically rational meta-learned inference explains human category learning. *International Conference on Machine Learning (ICML)*, 2024.

[3] **Julian Coda-Forno**, Kristin Witte, Akshay K Jagadish, Marcel Binz, Zeynep Akata, and Eric Schulz. Inducing anxiety in large language models increases exploration and bias. *arXiv:2304.11111*, 2023.

[4] Elif Akata, Lion Schulz, **Julian Coda-Forno**, Seong Joon Oh, Matthias Bethge, and Eric Schulz. Playing repeated games with large language models, 2023.

[5] **Julian Coda-Forno**, Marcel Binz, Zeynep Akata, Matt Botvinick, Jane Wang, and Eric Schulz. Meta-in-context learning in large language models. *Advances in Neural Information Processing Systems*, 36, 2023.

[6] **Julian Coda-Forno**, Changmin Yu, Qinghai Guo, Zafeirios Fountas, and Neil Burgess. Leveraging episodic memory to improve world models for reinforcement learning. *Memory in Artificial and Real Intelligence (MemARI) workshop at NeurIPS*, 2022.