Julian Coda-Forno

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EDUCATION

PhD Candidate in Computer Science, **2022-2026**

Max Planck Institute for Biological Cybernetics, *Tübingen & London*

Title: "Cognitive Models of Deep Meta-Reinforcement Learning"
Primary supervisors: Dr Eric Schulz (Max Planck Institute for Biological Cybernetics) & Dr Jane X. Wang (Google Deepmind).
Collaborators: Professor Zeynep Akata (University of Tübingen) & Professor Matthew Botvinick (Google DeepMind).

MSc Data Science & Machine Learning, University College London, *London, UK* **2020-2021**

Grade: Distinction (82.6%) & Dean's List.

- **Research Thesis:** "Leveraging episodic memory in model-based RL" supervised by Prof. Neil Burgess and Dr. Zafeirios Fountas.

BEng Aerospace Engineering, University of Manchester, *Manchester, UK* **2015-2019**

PUBLICATIONS

[1] **Coda-Forno, J.**, Yu, C., Guo, Q., Fountas, Z., Burgess, N. Leveraging Episodic Memory to Improve World Models for Reinforcement Learning. *Memory in Artificial and Real Intelligence (MemARI), NeurIPS workshop* (**2022**). https://memari-workshop.github.io/papers/paper_3.pdf

[2] **Coda-Forno, J.**, Binz, M., Akata, Z., Botvinick, M JX Wang., Schulz, E. Meta-in-context learning in large language models. *Advances in Neural Information Processing Systems, 37* (**2023**). https://arxiv.org/pdf/2305.12907.pdf

[3] **Coda-Forno, J.**, Witte, K., Jagadish, A., Binz, M., Akata, Z., Schulz, E. Inducing anxiety in large language models increases exploration and bias (**2023**). https://arxiv.org/abs/2304.11111.

[4] Akata, E., Schulz, L., **Coda-Forno, J**., Oh, S., Bethge, M, Schulz, E. Playing repeated games with Large Language Models (**2023**). https://arxiv.org/pdf/2305.16867.pdf

SUPERVISION

- **Natalia Scharfenberg:** Universität Osnabrück, Master Thesis: Using LLM's representations for RL. **2023**

EXPERIENCE

Visiting Research intern (10 months), UCL & Huawei, *London, UK* **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.
- Created an episodic memory module, integrated it to the Dreamerv2 agent and tested it on Atari games using Python.
- Gained experience in JIT compilation with the use of Tensorflow2 graph's mode for more efficient computations.

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

- Collaborated in a clustering project in the R2 Data Lab to provide optimization of the Trent-7000 operational costs. This provided me with hands on experience in unsupervised learning techniques to tackle industrial problems with unlabeled data.
- Created individually a tool with a Graphical User Interface responsible for the checking and the issuing of Rolls-Royce safety critical standards for the company's documents with Python.

AWARDS AND CERTIFICATIONS

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

SUMMER SCHOOLS

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

SKILLS AND INTERESTS

- **Trilingual:** Native/bilingual proficiency in English, French and Spanish
- **Programming skills:** Proficient in the use of Python, NumPy, Pandas, PyTorch, Tensorflow2 and GIT - intermediate in R, Julia and SQL.
- **Interests:** Played football for the University of Manchester football team and represented the Nice Ski Federation in races in South Alps.

References available upon request.