

Corentin Léger - AI Research Engineer

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Research Engineer with a strong foundation in Machine Learning and Software Engineering, I specialize in Reinforcement Learning, LLMs, and Evolutionary Algorithms. I'm passionate about solving complex, interdisciplinary challenges, and continuously expanding my skills and knowledge.

SKILLS

- **Programming:** Python, Git, Bash, Web Development, SQL, Cloud Computing, Network, CI/CD
- **Python frameworks:** Numpy, Jax, PyTorch, TensorFlow, Scikit Learn, Optuna, Hydra, Pandas, Flask, Gym, pytest

EXPERIENCE

- **Inria** Bordeaux, France
Research Engineer, Flowers Team *Dec 2023 - Present*
 - **Vivarium:** Developed a multi-agent simulator built in Jax, for AI research and teaching. It enables real-time interaction (100+ fps) between simulations and web or Jupyter notebook clients with gRPC. Created a CI/CD pipeline for automated tests (pytest, Github actions). Supervised a Master's intern to improve the clients and create educational Notebook sessions.
 - **LLM-Culture:** Developed the Open-Source LLM-Culture software to simulate and analyze text evolution in LLM-based multi-agent systems [2]. The system models agent interactions based on neighbors outputs, task, and personality across generations. Built NLP (SpaCy, NLTK) and Data Visualization tools to evaluate text properties. Created a user-friendly Flask-based web interface for accessibility to non-programmers.
 - **Telephone Games:** Conducted large-scale simulations to explore biases and attractors in multi-turn LLM interactions [1]. Used various LLMs across 100 generations, and analyzed text attributes (positivity, difficulty, toxicity, length) with 3 different tasks.
- **Inria** Bordeaux, France
Machine Learning Research Intern, Flowers and Mnemosyne Teams *May 2023 - Nov 2023*
 - **ER-MRL:** Led research to understand how optimizing RNNs with Evolutionary Algorithms can improve Deep Reinforcement Learning agents' adaptability in new environments [3] (Sb3, Gym, Optuna). Implemented a parallelized experiment pipeline with Bash and Slurm scripts, to launch and analyze large scale trainings on remote clusters (code).
 - **Parallelization tutorial:** Created a tutorial for parallelized hyper parameter search in ReservoirPy (400+ stars), enabling researchers and students to increase their experiments speed by a factor of 300 on the University Cluster.
- **Connectiv-IT** Bordeaux, France
Data Scientist Intern *May 2022 - Aug 2022*
 - **Data preprocessing:** Applied Pandas and Scikit-Learn to preprocess helicopter maintenance data, performing cleaning, outlier detection (filtered out 25% of unusable data), and used supervised learning to replace 12% of missing values.
 - **Data analysis:** Used statistical analysis (SciPy) and clustering (Scikit-Learn) to identify key trends in maintenance data, and created visualizations and technical reports to support data-driven maintenance strategies.

PUBLICATIONS

Google Scholar

- [1] **When LLMs Play the Telephone Game:** Perez, J., Léger, C., Kovač, G., Colas, C., Molinaro, G., Derex, M., Oudeyer, P. Y., Moulin-Frier, C. (2024). Arxiv preprint (under review)
- [2] **Cultural evolution in populations of Large Language Models:** Perez, J., Léger, C., Ovando-Tellez, M., Foulon, C., Dussauld, J., Oudeyer, P. Y., Moulin-Frier, C. (2024). Arxiv preprint
- [3] **Evolving Reservoirs for Meta Reinforcement Learning:** Léger, C., Hamon, G., Nisioti, E., Hinaut, X., Moulin-Frier, C. (2024). In International Conference on the Applications of Evolutionary Computation (part of EvoStar)
- [4] **Early Empirical Results on Reinforcement Symbolic Learning:** Radji, W., Léger, C., Bardisbanian, L. (2023). Research report in HAL Inria

SELECTED PROJECTS

Complete list of projects

- **Hackathon: LeRobot:** Assembled robotic arms, and create a real world Reinforcement Learning environment. Recorded a dataset of objects manipulation with the LeRobot library, and trained an arm to push cubes with both online and offline RL.
- **Open Source Contributions:** Fixed several issues in the Stable-Baselines3 (8k+ stars) RL Library. Created a Hugging Face app to interpret RL policies using Kolmogorov-Arnold Networks (KANs), and benchmarked PPO and PG performance with KANs.
- **Hackathon: EbiOSE:** Built a tool to optimize multi-LLM agent systems on math tasks, using evolutionary algorithms (blog post) in a two-day hackathon. We matched the performance of GPT-4 with our system of multiple GPT-3.5 agents.

EDUCATION

- **Ecole Nationale Supérieure de Cognitive** Bordeaux, France
Master of Science in Computer and Cognitive Sciences; GPA: 4.00 *Sept. 2020 - Sept. 2023*
- *Exchange programs in Data Science and AI at Laval University (Canada) and Enseirb-Matmecca*
Relevant courses: Machine Learning, Deep Learning, Reinforcement Learning
- **Cycle Préparatoire de Bordeaux (CPBx)** Bordeaux, France
Bachelor of Science in Mathematics and Physics, Sport-Study contract in Volley-ball *Sept. 2018 - Jun. 2020*