Xavier Theimer-Lienhard
Research Associate in Machine Learning
Website : xaviertheimerlienhard.com

Research Associate **EPFL**

LiGHT Lab (Meditron) **(apr 2025-present)**

- **Co-lead, Apertus-Meditron-FO, a fully-open medical adaptation of LLM Apertus 8B/70B.**
  - Curated and standardized the Mediset instruction-tuning corpus with rationale generation and PMC evidence augmentation.
  - Engineered multi-node training workflows with Axolotl + DeepSpeed ZeRO-3 on HPC clusters for reproducible large-scale finetuning.
  - Delivered ~10 pp improvement on medical benchmarks.
  - Championed full-stack openness and auditability for clinical LLMs through public release of weights, datasets, and training methods.

Short Term Scholar at Yale University **Yale University**

LiGHT Lab (Meditron) **(sep 2024-april 2025)**

- **Team Lead, Meditron reinforcement learning / reasoning**
  - Led RLHF post-training (GRPO) and SFT reasoning distillation of medical models.
  - Training optimization on SLURM clusters with vLLM, Deepspeed, Axolotl.
  - Built the evaluation pipeline of our models (MCQA, model judges…).
  - Achieved a +30 pp gain on general benchmarks (MMLU, GPQA) and a +9 pp gain on medical benchmarks (MedMCQA, …).
  - Involved in the full LLM development pipeline (data, pre-training, reinforcement learning, evaluation) of Meditron, our open-source suite of medical LLMs.
- **Team Lead, Meditron synthetic data pipeline**
  - Developed a synthetic data pipeline for generation of safe and representative data.
  - Created a dataset of synthetic medical clinical notes (DSPy, RAG, Transformers).
  - Collaborated with medical doctors for iterative feedback and evaluation.
  - Managed a small team of students, led weekly meetings and distributed tasks.

Graduate Researcher **EPFL**

LiGHT Lab (Meditron) **(sep 2023-sep 2024)**

- **Developed Meditree, a Tree Of Thought LLM test-time method for Medical reasoning**
  - Improved test-time scaling and differential diagnosis capabilities.
  - Achieved a +5 pp gain on medical benchmarks for our medical LLMs in our Llama-3-Meditron publication, reaching GPT4 performance.
- **Built a synthetic data pipeline to generate structured medical guidelines**
  - Transformed medical guidelines into structured data for differential diagnosis.
- **Contributed to training a state-of-the-art medical finetune of Llama under 24h after release.**

ML & Software Engineer **Irbis Consulting SA**

Part time **(sep 2023-sep 2024)**

- **Developed an Electron application to automate bidding document creation**, incorporating user feedback into iterative releases.
- **Built a deep-learning captcha solver in PyTorch** and implemented a web scraper with search retrieval capabilities.

Education

- **MSc of Data Science @ EPFL** **5.4/6 GPA** (sep 2022-apr 2025)
- **BSc of Communication Systems @ EPFL** (sep 2018-sep 2022)

Publications

Enhancing Meditron capabilities with synthetic and reasoning datasets [Thesis]
2025 - Master Thesis - Finetuning Open-source LLMs to obtain better medical reasoning performances.

Llama-3-Meditron: An Open-Weight Suite of Medical LLMs [OpenReview]
2024 - AAAI Workshop - We reach GPT4 performance using the Meditree method on medical evaluations.

GPoeT: A language Model for Rhyme Generation on Synthetic Data [ACLAnthology]
2023 - ACL SIGHUM - We finetune GPT-2 on poems and obtain more rhymes than the baseline.

Skills

Machine Learning & Deep Learning:
LLMs, Reinforcement Learning (RLHF, GRPO, DPO), Supervised Fine-Tuning (SFT), Synthetic Data Generation, Tree-of-Thought / reasoning pipelines, model evaluation, PyTorch, Hugging Face Transformers, Axolotl, vLLM, DeepSpeed ZeRO-3, Accelerate, FlashAttention, Triton, Docker, Distributed & HPC Training, Multi-node and multi-GPU orchestration with SLURM.

Software Engineering:
Python (advanced), Bash, Git/GitHub, Electron, JavaScript/TypeScript, SQL, REST APIs, web scraping.

Research & Leadership:
Experiment tracking, ablation studies, statistical evaluation, reproducible documentation, benchmarking, Team leadership in interdisciplinary ML + health research (mentoring MSc students, coordinating cross-lab projects). Public release and documentation of open-source models, datasets, and training pipelines, Scientific writing (Nature/AAAI/ACL style), technical communication, visualization (Matplotlib, LaTeX, HTML/CSS), academic presentation, bilingual (English / French).