Andrii Nikolaiev, PhD

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Research Scientist with a PhD in Computer Science and 5+ years of experience in ML and AI. Expertise in end-to-end design and deployment of LLMs for reasoning tasks, including dataset design, benchmarking, model optimisation, and HPC/cloud deployment. Recognised for impactful STEM initiatives. Passionate about translating research into real-world solutions.

Education

- **Ph.D. in Computer Science**, Taras Shevchenko National University of Kyiv (2020–2025)
- **Visiting Postgraduate Research Student**, NLIP Group, University of Cambridge (2023–2025)
- **B.Sc. & M.Sc. in Computer Science (Honours)**, Taras Shevchenko National University of Kyiv (2014–2020)

Professional and Academic Experience

Researcher, University of Cambridge
Apr 2023 – Present

- Developed benchmark datasets, revealing up to 30% variance in LLM reasoning due to textual modifications.
- Deployed language models (*GPT, LLaMA, Mistral, Qwen*) on HPC clusters and cloud VMs using *llama.cpp*.
- Led human evaluation studies with 40 participants to validate benchmark difficulty and model performance.

Researcher, Osiris AI
Aug – Sep 2025

- Improved pipeline accuracy by 10–15% for historical records using multimodal LLMs.
- Parsed *PAGE XML* (eScriptorium) and raw images; deployed models with *vLLM, Ollama* across distributed VMs.
- Investigated OCR and text segmentation pipelines using *Mistral OCR* and *Kraken*.

PhD Student, Taras Shevchenko National University of Kyiv
2020 – 2025

- Benchmarked 15+ LLMs on automated reasoning tasks with 860K+ Chain-of-Thought examples.
- Built data generation and evaluation pipelines with LLM-as-a-Judge, cutting annotation costs by 40-50%.
- Published studies on data augmentation and reasoning evaluation in peer-reviewed journals.

Projects

AI Maths Tutor (Educational STEM project for kids)
Aug 2024 – Present

Coordinated a development team building an LLM-based platform for automated maths problem grading. The project involved dataset creation from online maths classes, integration into teaching workflows, and scalable training pipelines on *Google Cloud Platform* and *Kubernetes.*

Neural Network Chess Engine (B.Sc. & M.Sc. Thesis)
Mar 2018 – May 2020

Developed a distributed Reinforcement Learning + Monte Carlo Tree Search chess engine without handcrafted heuristics. Developed pre-training loop using data from *FICS*. Used *TensorFlow, PyTorch, Ray* for distributed training on *Google Colab*. Reached 2000+ ELO in chess within 12 hours of self-play testing on *lichess.org*. Adapted engine for other gaming environments, including Atari.

Solar Flare Classification (Samsung ML Research)
Mar – May 2018

Processed and visualised solar flare data; benchmarked traditional ML models and trained neural networks for classification. Achieved 99% accuracy on the *UCI Solar Flare dataset.* Collaborated in a 3-person research team and presented the results.

Selected Publications

- *Neural Network Methods for Selecting and Generating Synthetic Variations of Combinatorial Problems*, Cybernetics and Sys. Analysis, **Springer Nature**, 2025.
- *Can Language Models Rival Mathematics Students? Evaluating Mathematical Reasoning through Textual Manipulation and Human Experiments* **ACL RR**, arXiv preprint, 2024.

Grants and Awards

- **Emergent Ventures Grant Winner**, Mercatus Center, USA (2023–2025) – recognised for innovative STEM project.
- Fully funded research placement, University of Cambridge (2023–2025).

Additional experience

- **Leadership.** Co-founder and director of STEM education program for school children – project link (1000+ students, $140K+ funding, 2016 – Present). Organised educational boot camps for talented mathematicians and school teachers at *NGO Kontora Pi* (2019).
- **Teaching.** Teacher assistant in Databases, Cloud Computing, and AI at *Taras Shevchenko National University of Kyiv*; C++ teacher and contest setter at *Programming and Information Technology School* (2016–2019); Python lecturer at *Ukrainian Physics and Mathematics Lyceum* (2016).
- **Outreach.** Jury member on *Ukrainian mathematical competitions* (2016–2023). Co-initiated interdisciplinary volunteer classes *Let's Get Distracted!* to support the mental well-being of children, reaching out 300+ kids (2022).

Technical Skills

- **Programming:** Python, R, MATLAB, C/C++, SQL, LaTeX   **Languages:** English (fluent), Ukrainian (native)
- **Frameworks & Libraries:** TensorFlow, PyTorch, Ray, Hugging Face, llama.cpp, vLLM, Ollama, SciPy, NumPy, Pandas, Scikit-learn
- **Deep Learning & LLMs:** Transformers, LSTM, GPT, BERT, CNN, RNN, MoE, multimodal LLMs
- **Cloud & MLOps:** HPC clusters, Google Cloud Platform, distributed systems, Git, UNIX