

Gregory Polyakov

🌐 polgrisha.github.io

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SUMMARY

A second year PhD student at the University of Tübingen and IMPRS-IS with a strong background in applied mathematics, computer science, and industrial research in machine learning. I study the interpretability of deep learning models for NLP and IR, working to understand their internal mechanisms and leverage these insights for controlling model behavior, improving safety, and building more reliable systems. Published at top-tier venues (EMNLP, SIGIR) and experienced in industrial R&D for production search engines and voice assistants.

EDUCATION

University of Tübingen & Max Planck Research School

Tübingen, Germany

PhD in Computer Science

Sep 2024 - Present

- Health-NLP Lab, Supervisor: Prof. Dr. Carsten Eickhoff. [🔗](#)
- Affiliated Scholar, International Max Planck Research School for Intelligent Systems (IMPRS-IS). [🔗](#)
- Research topics: Interpretability of Deep Learning Models for NLP and IR tasks.

Moscow Institute of Physics and Technology

Moscow, Russia

MSc in Applied Mathematics and Computer Science; GPA 3.35 / 4.00

Sep 2021 - Jul 2024

- Research topics: Sparse Retrieval, Multimodal Retrieval, Tool Calling in LLMs.
- Thesis title: “Approaches to Training Language Models for External Function Calling: Using Self-Generated Data for Better Error Detection and Recovery”.

BSc in Applied Mathematics and Computer Science; GPA 3.48 / 4.00

Sep 2017 - Jul 2021

- Thesis title: “Usage of MCMC Methods in Deep Learning”.

WORK EXPERIENCE

Huawei Noah’s Ark Lab [🔗](#)

Moscow, Russia

NLP Research Engineer, full-time

Nov 2022 - Sep 2024

- Investigated LLM tool usage capabilities. Developed a fine-tuning strategy for error recovery, leading to a publication at the ACL 2025 REALM Workshop
- Conducted research on multimodal (Text-Video) retrieval, contributing to video retrieval post-processing techniques published at SIGIR 2023.
- Designed and co-implemented the end-to-end NLU pipeline for a production car voice assistant in Russian.

NLP Research Intern, full-time

Oct 2021 - Nov 2022

- Co-developed and optimized the reranking algorithm for a large-scale product search engine in Russian.
- Improved the reranker model quality by 5% and reduced its inference latency by 1.5x by adapting novel architectural (ColBERTer) and distillation approaches (TinyBERT).

PUBLICATIONS

Understanding Wacky Weights: A Dissection of SPLADE’s Learned Term Importance

SIGIR 2026

G. Polyakov, H. Scells, C. Eickhoff [🔗](#)

- Introduced metrics to formally quantify wacky weights (semantically unrelated expansion terms) in SPLADE sparse retrieval models.
- Showed that wacky weights mainly drive in-domain effectiveness, and measured which SPLADE settings promote more wacky weights.

G. Polyakov, C. Hepting, C. Eickhoff, A. Bahrainian [↗](#)

- Investigated the internal processing mechanisms of LLMs underlying in-context learning for arithmetic tasks.
- Proposed a novel steering approach based on interpretability insights that boosts zero-shot performance, reducing the need for few-shot examples.

G. Polyakov, C. Chen, C. Eickhoff [↗](#)

- Proposed a noise-mitigating evaluation metric for activation patching in neural rankers that filters out spurious low-confidence signals.
- Systematically analyzed diagnostic datasets, identifying key selection criteria for queries and documents to ensure robust interpretability analysis.

G. Polyakov, I. Alimova, D. Abulkhanov, I. Sedykh, A. Bout, S. Nikolenko, I. Piontkovskaya [↗](#)

- Proposed a novel fine-tuning strategy that enhances LLMs’ ability to autonomously self-correct API calls by learning from runtime execution feedback.
- Co-developed evaluation datasets designed to assess tool-augmented LLMs in more realistic scenarios.

K. Yakovlev, G. Polyakov, I. Alimova, A. V. Podolskiy, A. Bout, S. I. Nikolenko, I. Piontkovskaya [↗](#)

- Co-developed a new post-processing method based on Sinkhorn transformations that improves video retrieval quality.
- Introduced a realistic evaluation setting to compare post-processing methods in scenarios closer to real-world applications.

FUNDING & SCHOLARSHIPS

Selected as one of 1,200 recipients nationwide for this highly competitive prize recognizing high academic merit and strong participation in competitions. Included a full 4-year stipend supporting undergraduate research and studies.

TEACHING EXPERIENCE

University of Tübingen

Teaching Assistant, Modern Search EnginesSummer Semesters 2025, 26

- Conducted hands-on tutorials, evaluated assignments, and mentored student projects.

Teaching Assistant, Introduction to Python ProgrammingWinter Semesters 2024/25, 2025/26

- Conducted hands-on tutorials and evaluated student assignments.

SKILLS

Programming Languages and frameworks: Python, C/C++, Bash, $\LaTeX$.
Technologies: PyTorch, Transformers, FAISS, PEFT, Scikit-learn, Transformer Lens, CatBoost, Pyro.
Languages: Russian (native), English (C1, IELTS Band Score 7).