Zulfiya Usmonova

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Research Interests: Multi-Agent Systems — Human-AI Interaction— LLM Robustness — Network Science

Education

Technical University of Munich (TUM) Munich, Germany
MSc in AI in Society *Oct. 2025 – Aug. 2027*

- Coursework: AI in and for Society, Human-AI Interaction, Law and Governance of AI, Foundations of AI and Data Science.

New Uzbekistan University Tashkent, Uzbekistan
BSc in Software Engineering, GPA: 4.1/4.5 (Rank: 4/115) *Oct. 2021 – Jun. 2025*

- Honor of University Award (2023) and Top Student Award (2022).
- Engaged in Topological Data Analysis seminars and guest lectures from TUM, Cornell, and MIT faculty.

Comenius University in Bratislava Bratislava, Slovakia
Exchange Semester (NSP Scholarship Recipient) *Feb. 2025 – Jun. 2025*

- Actively involved in peer-review conferences and seminars hosted by AI industry professionals (e.g., Google DeepMind founders, Student Conferences).

Skills

Programming: Python, SQL, R, Git
Libraries & Frameworks: Scikit-learn, Pandas, Matplotlib, NetworkX, LangChain, AutoGen, PyTorch
Key Coursework: Neural Networks, Statistical Methods in AI, Combinatorics & Graph Theory, Linear Algebra, Probability Models, Biostatistics, Calculus 1&2

Research experience

Bachelor's Thesis Sep. 2024 – Apr. 2025
When AIs Change Their Minds: Testing LLM Robustness to Altered Voting Protocols *Tashkent, Uzbekistan*

- Built a 100-agent simulation across 10 LLM families to test robustness under altered voting protocols.
- Designed a two-stage study: (i) individual baseline establishes per-model agree/disagree rates; (ii) network stage embeds agents in random d-regular graphs (d = 1 – 9) and measures vote-flip rates as peer exposure grows.
- Discovered that modest network degree (d > 1) can invert the majority for smaller instruction-tuned models (phi, Gemma) while larger, alignment-optimised models (GPT-4, Gemini) remain stable.
- Code and report: https://github.com/UsmonovaZulfiya/bachelor-s-thesis.git

Side Project May. 2025 – Aug. 2025
Can LLMs replicate human opinion? *Tashkent, Uzbekistan*

- Conducted a comparative study using responses from 108 human participants and 8 LLM agents (e.g., GPT-4, Claude, Gemini) across socially relevant topics.
- Modeled multi-agent experiments to simulate diverse personas and voting behavior under different context conditions.
- Analyzed agreement patterns using reasoning alignment, response similarity, and visualization dashboards.
- Code and Report: https://bit.ly/llm-vs-human-project

Book Chapter Dec. 2023 – Apr. 2024
Cloud Computing for Smart Education *CRC Press, Taylor&Francis Group*

- Transformative Pedagogy: Collaborative Learning with Cloud Architecture and Virtual Programming Labs.
- Focused on accessibility, real-time collaboration, the use of cloud-based platforms for education, and pedagogy optimization.
- Abstract available: https://bit.ly/book-chapter-link

Work Experience

AI Research Intern Jan. 2025 – Feb. 2025
UZINFOCOM *Tashkent, Uzbekistan*

- Developed multi-agent chatbots using LangChain, LangGraph, and AutoGen for NLP task coordination.
- Optimized SQL-based data pipelines for real-time conversational data retrieval.

Data Science Intern Apr. 2024 – Jun. 2024
MAAB Innovation *Tashkent, Uzbekistan*

- Applied SQL data transformation workflows, reducing query latency by 10%.
- Built Power BI dashboards for real-time KPI monitoring and trend analysis.

Professional Activities

Summer School in Math Jul. 2024 – Aug. 2024

- Participated in program on Integrable Systems (lectures by P. Etingof, MIT; Y. Berest, Cornell).

Seeds for the Future Global Competition 2nd place (Huawei) Sep. 2023 – Jan. 2024

- Developed a smart filtering system using IoT sensors and embedded programming, enhancing data collection and processing accuracy for environmental monitoring.
- Conducted extensive research and data analysis on past IoT projects to inform design improvements, contributing to a 20% increase in system efficiency.

AI Hackathon by Machine Learning Community of Uzbekistan
ML Engineer *Hackathon*

- Developed a model that suggests the medicine to the inserted diagnosis by using the Naive-Bayes model.

NASA Space Apps Challenge 2023
Winner team *Hackathon*

- Collected information about air pollution from the sources provided by NASA.
- Designed a survey investigating questions regarding the effect of air pollution on the citizens of Tashkent.

Leadership & Outreach

WomenInTech Ambassador (2025–Present); Huawei ICT Ambassador (2024–25); TechnovationGirls Mentor (2022–24); Academic Mentor at Summer School (2025–Present); Education Minister & General Secretary, NUU Student Council (2022–24).
Led outreach programs for 100+ students, coordinated research mentoring, and promoted women's participation in STEM.