

Deniz Nazarova

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Research Interests

Natural Language Processing, Multilingual NLP, Machine Learning, Neuro-Symbolic AI, Human-Centered Computing, Human-AI Interaction, AI Bias, Ethics and Safety, Socially Responsible AI, Mental Health

Publications

- **Nazarova, D.** (2023). Application of Artificial Intelligence in Mental Healthcare: Generative Pre-trained Transformer 3 (GPT-3) and Cognitive Distortions. In: Arai, K. (eds) *Proceedings of the Future Technologies Conference (FTC) 2023, Volume 1*. (FTC 2023, Lecture Notes in Networks and Systems, vol 813). Springer, Cham. https://doi.org/10.1007/978-3-031-47454-5_16
- Djordjevic, J., Gagoshashvili, M., Andrew, P., Veloso V., Palaniswamy, P., Leung, J. P., Nikolic, T., **Nazarova, D.**, Izaías, A. I., Abdel-Nabi, D., Mungure M. D., Tricia, T., Atay, H. (2022). *A Look into Frida's Participatory Grantmaking Model. "Resourcing Connections: Reflections on Feminist Participatory Grantmaking Practice"*. FRIDA. <https://youngfeministfund.org/a-look-into-fridas-participatory-grantmaking-model-resourcing-connections-reflections-on-feminist-participatory-grantmaking-practice/>
- Molchanova, E., Galako, T., Bruce, S., Fountoualkis, K., Smirnova, D., Panteleeva, L., Kosterina, E., Childebayeva, A., Radchenko, V., **Nazarova, D.**, & Kim, E. (2022, August 3-6). *Estimating the Effects of Covid-19 Outbreak on Mental Health (Comet): The Case of The Kyrgyz Republic* [Conference presentation abstract]. Twenty-second annual WPA (World Psychiatric Association) World Congress of Psychiatry, Bangkok, Thailand. <https://drive.google.com/file/d/13C37U0PhYhIjcfypHs6bXNS3B1GBD3Q9/view?usp=sharing>

Education

University of Washington | Seattle | Ph.D. in Computer Science & Engineering | 09.2024 – present

Supervisors: Dr. Yulia Tsvetkov, Dr. Tim Althoff

- Developing taxonomies for measuring AI safety in mental health
- Evaluating large language models against mental health benchmarks
- Engineering a supervisor model for improved oversight of LLMs in sensitive applications

American University of Central Asia | Bishkek, Kyrgyzstan | Bachelor's Degree | 09.2018 – 06.2023

Majors: Software Engineering, Psychology

GPA: 3.91/4.0

Software Engineering Senior Thesis: "Application of Artificial Intelligence in Mental Healthcare: Generative Pre-trained Transformer 3 (GPT-3) and Cognitive Distortions"

<https://drive.google.com/file/d/1i2eONcPClu9UPrATgX2t9u6OFNSg7zEn/view>

Psychology Senior Thesis: "Engineering and Estimating Efficiency of the Artificial Intelligence Chatbot in Reducing Cognitive Distortions among AUCA Students"

<https://drive.google.com/file/d/1lVt6vaxPundD5qorytCCvQoWzpwuvr-N/view>

Supervisors: Dr. Almaz Bakenov (SE), Dr. Elena Kosterina (PSY), Dr. Gulnara Kurmanova (PSY)

Mentors (Google Research): Dimitri Kanevsky, Artem Dementyev, Milagros Escovedo

- Trained a sentiment analysis model using transformers.
- Measured the performance of GPT-3 models and fine-tuned them on self-gathered data.
- Built an AI with the integrated database hosted on AWS EC2 (Python, PostgreSQL).

- Completed analysis of user data produced during the 8-week experiment (SPSS).
- Conducted interviews with psychologists and updated the program based on the results.

Nazarbayev University | Astana, Kazakhstan | Foundation Year Program | 08.2016 – 06.2017

Specialization: Biology/Chemistry

Main Research: Benzodiazepines as a modern treatment for young adults with chronic insomnia

Supervisor: Lucy Harrison

- Treatments for insomnia, with a focus on benzodiazepines.
- Interviews with psychiatrists to gain insights into current clinical perspectives.

Research Experience

ForSet's Advanced Data Communications Fellow | Data Engineer | 08/2024 – 12/2024

Focus Areas: suicide prevention, Kyrgyzstan, data storytelling, data visualization

- Collected and analyzed data on suicide and demographics from governmental sources.
- Translated complex findings into news articles with data visualization to engage a broad audience.

UN Women Europe and Central Asia | Data Engineer | 06/2024 – 10/2024

Focus Areas: femicide, gender-based violence, media coverage, hate speech, Uzbekistan

- Built a pipeline to scrape and process data from state and news websites on femicide cases (Python).
- Designed, maintained, and documented a database of femicide cases for open-source usage.
- Using the data, collaborated on a policy paper to propose preventive and interventive measures.

Neuromatch Academy | Summer NeuroAI Student | 07/2024 – 08/2024

Focus Areas: NeuroAI, machine learning, microlearning, cognitive architectures

- Designed experiments to measure the performance of Hebbian and SoftHebbian learning as biologically plausible alternatives to backpropagation using the MNIST dataset (Python).
- Completed training in the fields of NeuroAI (foundations, architectures, learning).

United Nations Development Programme (UNDP) | Data Analyst | 10/2023 – 01/2024

Focus Areas: creative industry, information technology, accessibility

- Completed analysis of qualitative (MAXQDA) and quantitative (SPSS) data for the media campaign.

Central European University | Data Engineer | 07/2023 – 10/2023

Focus Areas: intimate partner violence, Central Asia, same-sex relationships, data science

- Conducted comprehensive data analysis for a dataset of over 1000 individuals with web scraping.

UCLA Global Campus Violence Prevention Network | Student Advisory Board | 02/2022 – 05/2023

Focus Areas: public health, harassment, women's rights

- Assessed university-wide survey outcomes and communicated adjustments to training programs.
- Presented findings of the study during global meetings and transferred them to AUCA.

Neuromatch Academy | Summer Machine Learning Intern | 06/2021 – 09/2021

Focus Areas: computational neuroscience, deep learning, natural language processing, Big Data

- Trained a neural network that recognized with 93% accuracy whether a patient took a language or math test based on fMRI scans (Python, NumPy, matplotlib)
- Concluded training in the fields of AI (deep learning, natural language processing, computer vision), mathematics (multivariate calculus, stochastics, dynamical systems, optimization), and neuroscience.

American University of Central Asia | Data Analyst | 09/2021 – 05/2022

Focus Areas: COVID-19, mental health, social isolation

- Cleaned and analyzed data of 2000+ people (SPSS) on mental health changes during the pandemic.
- Performed literature review, significantly contributing to the final version of the abstract.

AUCA Counseling Service | Researcher Assistant | 05/2021 – 09/2021

Focus Areas: youth mental health, education, youth counseling

- Executed a quantitative study to investigate the impact of pursuing a bachelor's degree on well-being.

- Presented research findings to advocate for mental health awareness facilities on campus.

American University of Central Asia | Researcher Assistant | 02/2021 – 05/2021

Focus Areas: Parkinson's disease, support network, brain disorders

- Performed qualitative analysis of focus group discussions and interviews.

FRIDA fund | Co-researcher | 09/2019 – 05/2020

Focus Areas: participatory grantmaking model, intersectionality, feminism

- Led and analyzed interviews to assess participatory grantmaking effectiveness.
- Reviewed the draft of the report prior to submission.

Three River Stories | Research Assistant | 03/2019 – 07/2019

Focus Areas: ecology, water pollution, collective action

- Processed archival data to analyze the fluctuations in pollution levels.
- Documented the events during the research trip to the Naryn River.

Awards and Scholarships

2024	Advanced Data Communications Fellowship, ForSet
2024	Paul G. Allen School First-Year Ph.D. Fellowship
2023	Best Thesis Award, Software Engineering Department
2023	Best Thesis Award, Psychology Department
2023	Outstanding Contribution Award, AUCA Writing and Academic Resource Center
2023	Best Research Internship, Annual Student Symposium
2022	Exceptional Leadership Award, Student Affairs Office
2022	Recognition of Excellence, Annual Research Symposium
2022	Student Life Excellence Award, Student Life Office
2022	CCE Capstone Grant, AUCA Center for Civic Engagement
2021	Double Major Scholarship – <i>covers tuition for the fifth year to complete the second major</i>
2019-2023	Dean's Lists, President's Lists, Highest GPA at the Department
2018	Golden Certificate Scholarship, President of the Kyrgyz Republic – <i>covers tuition for the entire duration of a bachelor's degree at any university in the Kyrgyz Republic. This scholarship is awarded to individuals who achieve the top 50 results in the nationwide university entrance test, with the recipient ranking third.</i>
2016	"Abai Kunanbayev" Scholarship, Nazarbayev University International Cooperation Office – <i>covers tuition for the foundation year program.</i>
2016	Valedictorian, Educational Complex of Physical and Mathematical Lyceum School No. 61

Conferences & Seminars

- Empirical Methods in Natural Language Processing 2024. Participant. Miami, FL. Nov 12-17, 2024.
- "Research of Femicide Cases in Central Asia". Participant. UN Women. Almaty. May 26-28, 2023
- "Is AI Ready to Work with Mental Health of Humans?". Speaker. AI club. Bishkek. Nov 22, 2023
- "Application of AI in Mental Healthcare". FTConference. San Francisco. Nov 2-3, 2023
- Women and Research. Visiting Scholar. Bard College. Annandale-On-Hudson, NY. March 6-10, 2023
- In AI We Trust. Book Reviewer. Yehuda Elkana Fellowship. Vienna, Austria. June 22-25, 2021
- #SayEnoughAsia. Workshop Lead. Oxfam. Bangkok, Thailand. January 20-22, 2020
- Game Changer Hackathon. Prague Civil Society. Bishkek, Kyrgyzstan. September 26-28, 2019
- Stanford Big Data by Prof. Jennifer Widom. Bishkek, Kyrgyzstan. September 11-13, 2019
- Transforming the Normal in Asia. Workshop Lead. Oxfam. Bangkok, Thailand. October 1-4, 2018

Teaching and Mentoring Experience

Pre-Application Mentorship Service (PAMS) | University of Washington | Mentor | 10/2024 – 11/2024

- Mentored 4 people from underrepresented background on grad school application process.

Online Museum of Central Asian Women | Mentor | Contract work | 07/2024 – 09/2024

- Mentored 5 girls from Central Asia on data storytelling and archival data.

- Conducted a session on visual storytelling techniques when working with familial data.

Private Mentor | 05/2024 – present

- Provided regular low-cost mentoring sessions for 30 women from disadvantaged backgrounds.

AUCA Writing and Academic Resource Center | Peer tutor | 08/2020 – 06/2023

Specialization: Academic Writing, Statistics, SPSS

- Delivered 12 hours of weekly one-on-one tutoring sessions.

Open Society University Network | Teacher Assistant | 09/2022 – 12/2022

Course: Feminism and Psychology

American University of Central Asia | Teacher Assistant | 10/2021 – 12/2022

Courses: SPSS and Statistics, Psychogenetics

AUCA Academic Advising Office | Peer Advisor | 10/2021 – 05/2022

- Provided academic advising to students (one-to-one sessions, workshops, and seminars).

Work Experience

EPAM Systems | Junior Data Engineer | 02/2024 – 07/2024

- Developed and tested Kafka producers and consumers to handle high-volume data pipelines.
- Implemented data transformations and aggregations using Spark SQL and DataFrames API.
- Utilized Azure Blob Storage and Azure SQL Database for efficient and scalable data management.
- Participated in an EPAM mentoring program with consistent guidance from a Senior-level specialist.

EIWA, AI Doula | ML Engineer | 10/2023 – 09/2024

EIWA reached the top-5 result at the Glovo KG Startup Competition (out of more than 250 companies that applied).

- Integrated AI solutions into a chatbot that guides women on medical prescriptions during pregnancy.
- Applied knowledge graphs to guide decisions on postpartum mental health support.

USAID WSpark Women in Tech & Barys Bot | Full-Stack Web Developer | 05/2023 – 12/2023

- Implemented AI-driven features, tailoring machine learning algorithms to the Kyrgyz language.
- Contributed data in Kyrgyz to the open-access projects focused on [NLP in Kyrgyz language](#).
- Developed, maintained, and optimized server-side applications (Python, Django, PostgreSQL, AWS).
- Created responsive, user-friendly web interfaces (HTML, CSS, JavaScript/React).
- Engaged in intensive training on startup acceleration hosted by leading professionals in Central Asia.

AUCA Writing and Academic Resource Center | Project Lead | 12/2021 – 05/2023

Kyrgyz Language Tutorials (WARC, 2021 – 2023). YouTube.

https://www.youtube.com/playlist?list=PL6qOovHuk47nc_FLA9hEWHNr9OvfY34s2

- Supervised the regular delivery of Kyrgyz language tutorials within a team of peer tutors.

USAID & Open Line | Campaign Developer | 06/2020 – 11/2020

- Executed the design of a social media campaign addressing domestic abuse in Kyrgyzstan.
- Programmed a platform that contacts victims of domestic violence with crisis centers (Python)
- Visualized data to extract insights and contributed to the review of advocacy documentation.

Grimwood | Summer Intern | 06/2019 – 08/2019

- Built and modified mobile games (Java, C#) applying essential programming patterns.

Additional Training

NLP (Hugging Face), Algorithms 4.0 (Yandex), Data Engineering (Databricks), Apache Kafka (Confluent), Digital Mapping (OSUN)

Community Service

PriMera Scientific Engineering (PSEN) | Board Member | 11/2023 – present

- Oversaw the peer review process, managing a team of reviewers to maintain timely reviews.

AUCA Student Senate | Chair | 10/2021 – 12/2022

Fields of work: mental health, crisis prevention, anti-harassment

- Directed work of committees and managed communication between students and administration.
- Served as an active member of the Faculty Senate, advocating for students' rights.

Brunch Club | Founder | 02/2023 – 10/2023

- Arranged community-building and advocacy events for women and LGBTQIA+ people in STEM.
- Initiated programming boot camps and learning activities based on oSTEM protocol.

@growthhungry | Project Lead | 04/2021 – 10/2021

@growthhungry by Taalai Djumabaev, Google Senior Software Engineer, helps MAANG applicants from KG.

- Conceptualized and implemented the company's infrastructure from scratch.
- Sustained the consistent production of content through networking sessions with MAANG employees.
- Recruited and onboarded new members, doubling the size of the original team.

Teenage and Youth for Justice and Equality | Co-lead | 06/2018 – 03/2020

- Coordinated staff, volunteers, and content contributors in the mental health awareness team.
- Conducted programming and math tutoring sessions for girls.
- Oversaw fundraising activities and managed the budget for annual grants.
- Supported international connections through networking with FRIDA Fund and Oxfam.

Kloop News Agency | Illustrator | 09/2019 – 11/2019

- Contributed illustrations for news articles addressing domestic violence in Kyrgyzstan.

Domestic violence: <https://kloop.kg/t/na-vidu-u-vseh/>

Azattyq Media Company | Illustrator | 01/2019 – 06/2019

- Illustrated series of news articles "Investigation of the economic situation in Kyrgyzstan".

Child labor: <https://rus.azattyk.org/a/kyrgyzstan-education-child-labour/29937017.html>

Microcredits: <https://rus.azattyk.org/a/pochemu-mikrokredity-ne-spasayut-ot-bednosti/30303155.html>

Labrys Kyrgyzstan | Volunteer | 08/2016 – 05/2018

- Engaged in community outreach programs to promote the organization's services and events.

Languages

English (C2), Russian (native), Kyrgyz (B2), Turkish (A2), French (A2)