

Gaukhar Nurbek

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EDUCATION

University of Texas RGV

Expected May, 2028

PhD Computer Science

- Thesis Focus: Machine Learning-Driven Signal Processing and Time Series Analysis for Gravitational Wave Detection from Supernova Events.

University of Texas RGV

May, 2024

MS Computer Science, GPA: 4.0/4.0

University of Texas RGV

May, 2021

MS in Interdisciplinary Studies in Science and Technology, GPA: 3.93/4.0

Kazakh-British Technical University

May, 2018

BEng Information Systems, GPA: 3.5/4.0

PUBLICATIONS

- Search for core-collapse supernovae signals in LIGO's third observation run using a multiclass CNN. Shahrear K. Faisal, **Gaukhar Nurbek**, Michael Benjamin, Bhawana Sedhai, and Soma Mukherjee, *Phys. Rev. D* 110, 064055, 2024.
- Efficient detection and reconstruction of gravitational waves from non-rotating 3D GR core-collapse supernovae. Soma Mukherjee, **Gaukhar Nurbek**, and Oscar Valdez, *Phys. Rev. D* 103, 103008, 2021.

RESEARCH EXPERIENCE

University of Texas RGV

Edinburg, TX

Graduate Research Assistant

Sept 2024 – Present

- Ran experiments and co-authored a paper on self-supervised learning for swarm robots using embedding compression; tools: **Python, PyTorch**; paper under review.
- Evaluated a time series embedding compression method to reduce storage without impacting downstream performance; paper under review.
- Built 14 out-of-distribution datasets and tested a model-agnostic method for detecting localized anomalies in multivariate time series.
- Benchmarked six foundational time series models in zero-shot and fine-tuned settings for cross-domain generalization.
- Helped build MTBench, a benchmark for time series + text QA and forecasting in finance and weather; created leaderboard web page (**TypeScript**) and drafted intro/related work.
- Improved model inference time by 4× via architectural and code optimizations; developing data pipelines for gravitational wave signal classification using **Python, PyTorch**.
- Analyzing large-scale time series using statistical methods, ML, and feature extraction; collaborating with astrophysicists to apply ML in gravitational wave detection.

Graduate Research Assistant

Aug 2023 – May 2024

- Designed and implemented reinforcement learning models for 3D locomotion using **Temporal Graph Neural Networks**; tools: **Python, PyTorch, PyTorch Geometric, MuJoCo**.

Staff Research Assistant

July 2021 – July 2022

- Improved signal detection algorithm by 5% and conducted gravitational waves data analysis using **MATLAB, C++, Python, and Bash** in an NSF-supported project.

Graduate Research Assistant

August 2019 – May 2021

- Enhanced signal classification pipeline using deep learning and time-frequency features; achieved 80% noise reduction using **MATLAB, Python**.

INDUSTRY EXPERIENCE

Uber

Sunnyvale, CA

Software Engineering Intern

May 2023 – Aug 2023

- Developed a key feature for an internal tool serving 10-15k weekly users using **Go** and **TypeScript**.
- Wrote production-level code, test coverage, and documentation; participated in end-to-end feature delivery cycle.

Kazdream Technologies

Astana, Kazakhstan

Data scientist

May 2019 – August 2019

- Built multilingual speech-to-text deep learning pipeline trained on 200K audio samples using **wav2letter, Python, CUDA, Docker**.

Center for Sustainable Capital Development

Astana, Kazakhstan

Data analyst

August 2018 – February 2019

- Built a time series regression model achieving 90% accuracy; deployed in a web app with **Flask, HTML/CSS and JavaScript**.
- Implemented a web crawler and processed 1 million rows of data using **Python, Selenium, BeautifulSoup, and SQL**.

TSARKA

Astana, Kazakhstan

Intern iOS developer

January 2018 – February 2018

- Developed iOS app interface using **Swift and GraphQL API** integration.

Inessoft

Astana, Kazakhstan

Intern web developer

May 2017 – July 2017

- Created 24 **database references** and **entity models** with **CRUD** functions, implemented user tracking and login flow using **C#/.Net MVC/Entity/SQL**.

Intern web developer

June 2016 – July 2016

- Built landing page and tax calculator module for an iOS app using **Objective-C**.

PROJECT EXPERIENCE

ML Interview Prep Tutor Chatbot

June 2024

- Built an interactive ML interview prep assistant using **Python, Django, LangChain, and OpenAI API**; optimized retrieval with vector embeddings.

Expert System's Chatbot (Kazakh/Russian)

January 2024

- Built a multilingual Q&A system by embedding user-specific knowledge using **LangChain, Chroma, and OpenAI API**.

TEACHING EXPERIENCE

Graduate Teaching Assistant

Fall 2022 - Spring 2024

- Led labs, graded, and held office hours for undergraduate/graduate courses in Deep Learning, Reinforcement Learning, and OOP.
- Mentored 300+ students, helping with debugging, coding, and ML conceptual understanding.

SKILLS

Languages: Python, Go, TypeScript, C++, Bash, MATLAB, SQL, HTML/CSS, JavaScript

Libraries/Frameworks: PyTorch, PyTorch Geometric, TensorFlow, LangChain, Flask

Tools/Platforms: Git, Docker, Jupyter, VS Code, OpenAI API, MuJoCo, CUDA

Specialized: Machine Learning, Deep Learning, Time Series Analysis, Reinforcement Learning, NLP, Statistical Modeling, Signal Processing, Multimodal Learning, ML for Physics, Research-Driven Prototyping