

ULIANA ZBEZHKOVSKA

Kharkiv National Air Force University
11A Myru Street, Apt. 75, Industrialnyi
District, Kharkiv, Kharkiv Region, Ukraine,
61001

Tel: (+380) 636279095
Email: ulianazbezhkhovska@gmail.com
ORCID: <https://orcid.org/0000-0001-6213-5531>
LinkedIn: <https://www.linkedin.com/in/uliana-zbezhkhovska-phd-5a1b949a/>

EDUCATION

Master's degree, Data Science,

Ukrainian Catholic University, Lviv, Ukraine, 2024

Fields of study: Machine Learning, Deep Learning, Natural Language Processing, Computer Vision, Data Analysis, Statistical Modeling, AI Ethics, Recommendation systems

PhD degree, Telecommunications and Radioengineering

Kharkiv National Air Force University, Kharkiv, Ukraine, 2023

Fields of study: Theory of chaos, signal processing, digital signal processing, radio communication, analysis of time series

Master's degree, Telecommunications and Radioengineering, diploma with honors
Kharkiv Air Force University, Kharkiv, Ukraine, 2015

APPOINTMENTS

Leading Researcher

Kharkiv National University of Air Force, April 2024 – Current

- Conducted research on educational quality standards and developed quality assurance frameworks
- Developed AI-based anti-plagiarism system for local university use
- Led teams in evaluating and improving curriculum and teaching methods using AI-powered analytics
- Designed and implemented AI tools to assist with personalized learning and student performance prediction

Teacher assistant at Generative AI course

Ukrainian catholic university, October 2024 – Current

- Check homeworks
- Provide detailed feedback on student assignments
- Support students in understanding complex generative AI concepts
- Grade assignments and projects according to established criteria
- Communicate with course instructors about student progress
- Help troubleshoot technical issues with AI implementations

Data scientist

Technology solutions scaling center of the General Staff of the Armed Forces of Ukraine,
July 2023 – April 2024

- Developed computer vision models for drone detection systems
 - Worked as an OSINT specialist
 - Implemented and optimized machine learning algorithms for military applications
 - Conducted data analysis and interpretation to support strategic decision-making
 - Collaborated with cross-functional teams to integrate AI solutions into existing systems
 - Researched and applied state-of-the-art computer vision techniques for aerial surveillance
 - Handled data collection, preprocessing, and feature engineering for model training
-

-
- Prepared technical documentation and reports on model performance and findings

Researcher

Kharkiv National University of Air Force, September 2023 – April 2024

- Conducted research to develop new communication systems for military applications
- Collaborated with team members to design and test communication technologies
- Analyzed data and implemented improvements to enhance system performance
- Prepared reports and presentations to communicate research findings
- Stayed updated with advancements in communication technology for military use

Research Fellow, remote

Center for Responsible AI at NYU, September 2023 – December 2023

- Developed methodology for close reading of data models, including selection criteria, analysis frameworks, and documentation standards
- Collaborated with team to refine and apply methodology in research projects

Expert

National agency for higher education quality assurance, September 2021 – Current

- Evaluate educational programs for compliance with quality criteria and national standards
- Analyze and assess documentation and practices of higher education institutions
- Prepare expert reports with recommendations for educational program improvement

Command and Control Officer

Ministry of Defence of Ukraine, February 2015 – Current

- Led strategic planning and execution of military operations
- Managed and coordinated multiple defense projects, ensuring timely and effective completion
- Supervised and mentored personnel, fostering leadership and teamwork
- Developed and implemented command and control protocols to enhance operational efficiency
- Analyzed intelligence data to support decision-making processes
- Facilitated communication and coordination between various military units and stakeholders
- Conducted training sessions to improve operational readiness and effectiveness

PUBLICATIONS AND RESEARCH WORKS

1. Zbezhkhovska, U., & Chumachenko, D. (2025). Smoothing Techniques for Improving COVID-19 Time Series Forecasting Across Countries. *Computation*, 13(6), 136. <https://doi.org/10.3390/computation13060136>
 2. Zbezhkhovska, U. R. (2025). DEEPFAKE AUDIO DETECTION USING YOLOV8 WITH MEL-SPECTROGRAM ANALYSIS: A CROSS-DATASET EVALUATION. *Radio Electronics, Computer Science, Control*, (1), 153–163. <https://doi.org/10.15588/1607-3274-2025-1-14>
 3. Zbezhkhovska, U., Slobodyanuk, V., Koval, O., Vasiuta, K., Kalinovskyi, D., & Yasynskyi, O. (2025). Deep learning for classifying chaotic signals transformed by advanced techniques. *International Journal of Computing Research Institute of Intelligent Computer Systems*. (under review).
 4. Zbezhkhovska, U., Khapilin, O. (2025). Deepfake Audio Detection with Sinc and Wavelet Filters in RawNet2. In: Ermolayev, V., et al. *Information and Communication Technologies in Education, Research, and Industrial Applications. ICTERI 2024. Communications in Computer and Information Science*, vol 2359. Springer, Cham. https://doi.org/10.1007/978-3-031-81372-6_20
-

-
5. Zbezhkholvska, U. (2024). *On effectiveness and generalization capabilities of deep learning models for deepfake audio detection* (Master's thesis). Ukrainian Catholic University, Faculty of Applied Sciences, Department of Computer Sciences.
 6. Zbezhkholvska, U., & Khapilin, O. (2024, March 29–30). Exploring challenges and future paths in deepfake audio detection. *5th Masters Symposium on Advances in Data Mining, Machine Learning, and Computer Vision (MS-AMLV 2024)*, Lviv, Ukraine.
 7. Khudov, H. V., Khizhniak, I. A., Hridasov, I. Yu., Zbezhkholvska, U. R., Yuzova, I. Yu., Solomonenko, Yu. S., & Kalimulin, T. M. (2024). Analysis of the tactical and technical characteristics and application strategies of existing FPV attack drones. *Control, Navigation, and Communication Systems*, 3, 70–79. <https://doi.org/10.26906/SUNZ.2024.3.070>
 8. Vasiuta, K. S., Zbezhkholvska, U. R., & Slobodyanuk, V. V. (2024). *Method for increasing the stealthiness of information transmission systems based on orthogonal frequency division modulation and chaotic subcarrier multiplexing* (Patent No. 155728, Ukraine). Bulletin No. 14.
 9. Vasiuta, K., Slobodyanuk, V., Zbezhkholvska, U., & Komin, D. (2022). Analysis of color noise effect on quality of recovering the chaotic signals with OFDM-modulation. In 2022 IEEE 9th International Conference on Problems of Infocommunications, Science and Technology (pp. 140–144). IEEE. <https://doi.org/10.1109/PICST57299.2022.10238686>
 10. Vasiuta, K. S., Zbezhkholvska, U. R., & Slobodyanuk, V. V. (2022). Analysis of the efficiency of information transmission systems with chaotic signals and OFDM modulation under the influence of intentional interference. *Collection "Information Technology and Security*, 10(2), 216–229. <https://doi.org/10.20535/2411-1031.2022.10.2.270439>
 11. Vasiuta, K. S., Zbezhkholvska, U. R., Slobodyanuk, V. V., & Stolyar, O. I. (2022). Study of the effect of colored noise on the quality of chaotic signal recovery. *Information Processing Systems*, 3(170), 15–22. <https://doi.org/10.30748/soi.2022.170.02>
 12. Vasiuta, K., Zbezhkholvska, U., Slobodyanuk, V. The method of increasing the stealthiness of information transmission systems based on modulating with orthogonal frequency division and multiplexing of chaotic subcarriers // *Radioelectronic and Computer Systems*. 2021. No. 3(0). P. 79-93. DOI: <https://doi.org/10.32620/reks.2021.3.07>
 13. Vasiuta, K., Zbezhkholvska, U., Slobodyanuk, V., & Kudriavtseva, A. (2021). Method of masking digital messages by chaotic sequences, formed with Chebyshev polynomials of the 1st kind of different orders. In 2021 IEEE 8th International Conference on Problems of Infocommunications, Science and Technology (pp. 300–304). IEEE. <https://doi.org/10.1109/PICST54195.2021.9772123>
 14. Vasiuta, K., Zbezhkholvska, U., Slobodyanuk, V., & Dubinsky, M. (2021). Method of recovering the binary message in systems with chaotic signals with OFDM-modulation using non-parametric BDS-statistic. In 2021 IEEE International Conference on Information and Telecommunication Technologies and Radio Electronics (pp. 115–118). IEEE. <https://doi.org/10.1109/UkrMiCo52950.2021.9716670>
 15. Vasiuta, K. S., Zbezhkholvska, U. R., Slobodyanuk, V. V., Zahryvyi, V. S., & Chystov, V. I. (2021). Method of hidden information transmission in systems with orthogonal frequency division multiplexing (OFDM) modulation. *Science and Technology of the Air Force of Ukraine*, 2(43), 132–139. <https://doi.org/10.30748/nitps.2021.43.18>
 16. Vasiuta, K., Zbezhkholvska, U., Slobodyanuk, V., & Kovalchuk, O. (2020). Stealth evaluation of the OFDM communication system. In 2020 IEEE International Conference on Problems of Infocommunications, Science and Technology (pp. 363-367). IEEE. <https://doi.org/10.1109/PICST51311.2020.9468046>
-

CONFERENCES AND SEMINARS

1. April 2025, XXI Scientific Conference "Digital Transformation in Education: Challenges and Prospects", Kyiv, Ukraine
 2. April 2025, XXI Scientific Conference "Latest Technologies for Air Space Protection", Kharkiv, Ukraine
 3. October 2024, XXIV International Scientific and Technical Conference "Artificial Intelligence and Intelligent Systems - AIIS'2024", Kyiv, Ukraine
 4. November 2024, First Inter-University Scientific Conference on Infocommunications, Kharkiv, Ukraine
 5. October 2024, International Scientific and Methodological Conference on Higher Education Modernization, Kharkiv, Ukraine
 6. October 2024, II All-Ukrainian Scientific and Practical Seminar on Linguistics and Language Didactics, Kharkiv, Ukraine
 7. October 2024, 24th International Scientific and Technical Conference on Problems of Informatics and Modeling, Kharkiv, Ukraine
 8. May 2024, XX Scientific Conference "Latest Technologies for Air Space Protection", Kharkiv, Ukraine
 9. March 2024, 5th Masters Symposium on Advances in Data Mining, Machine Learning, and Computer Vision, Lviv, Ukraine
 10. April 2023, XIX Scientific Conference "Latest Technologies for Air Space Protection", Kharkiv, Ukraine
 11. October 2022, IEEE 9th International Conference on Problems of Infocommunications, Science and Technology, Kharkiv, Ukraine
 12. July 2022, XVIII International Scientific Conference "Latest Technologies for Air Space Protection", Kharkiv, Ukraine
 13. October 2022, Scientific and Practical Conference on Service and Combat Activities, Kharkiv, Ukraine
 14. November 2022, Scientific and Technical Conference on Combat Use and Operation of Weapons, Vinnytsia, Ukraine
 15. February 2022, Scientific and Practical Conference on Modern Communication Systems, Kharkiv, Ukraine
 16. October 2021, IEEE 8th International Conference on Problems of Infocommunications, Science and Technology, Kharkiv, Ukraine
 17. November 2021, IEEE International Conference on Information and Telecommunication Technologies and Radio Electronics, Odesa, Ukraine
 18. October 2021, Scientific and Practical Conference on Service and Combat Activities, Kharkiv, Ukraine
 19. April 2021, XVII International Scientific Conference "Latest Technologies for Air Space Protection", Kharkiv, Ukraine
 20. February 2021, Scientific and Practical Conference on Modern Communication Systems, Kharkiv, Ukraine
 21. October 2020, IEEE International Conference on Problems of Infocommunications Science and Technology, Kharkiv, Ukraine
 22. April 2020, XVI International Scientific Conference "Latest Technologies for Air Space Protection", Kharkiv, Ukraine
 23. February 2020, Scientific and Practical Conference on Modern Communication Systems, Kharkiv, Ukraine
-

HONORS AND AWARDS

Honorary Badge of the Commander-in-Chief of the Armed Forces of Ukraine, “Cross of Military Honor”

Ministry of Defence of Ukraine, 2025

Scholarship for the Best Young Scientists to Commemorate the Events of the Revolution of Dignity and Honor the Heroism of Ukraine's Heroes – the Heroes of the Heavenly Hundred

Ministry of Education and Science of Ukraine, 2025

Air Force Commander's reward “For Diligent Service”

Ministry of Defence of Ukraine, 2015

Academic scholarship named after M.S. Hrushevskyi

Ministry of Defence of Ukraine, 2021

Scholarship of Verkhovna Rada of Ukraine

Verkhovna Rada of Ukraine, 2012

VOLUNTEERING

Mentorship Program Coordinator

Ukrainian Science Diaspora, April 2024 – Present

- Lead and organize mentorship initiatives connecting young Ukrainian researchers with international experts.
- Develop and implement training materials to support mentor-mentee relationships within the diaspora.
- Coordinate virtual and in-person events to foster collaboration and knowledge exchange among Ukrainian scientists globally.

Mentor in “From the frontline to data science consulting” program,

Ukrainian Catholic University, June 2023 – December 2023

- Guided veterans of the Russian-Ukrainian war in learning data science as a new profession
 - Provided support and assistance to students navigating the data science curriculum
 - Helped participants learn basics of data science methods and MLOps technologies for careers as consultants
-

PROJECTS

Comparing Methods of Estimation of Signal Parameters In this project, we review the Multiple Signal Classification (MUSIC) and Estimation of Signal Parameters via Rotational Invariance Techniques (ESPRIT) algorithms and compare them to vanilla Fast Fourier Transform (FFT) in terms of performance and limitations.

Link: https://drive.google.com/drive/u/2/folders/1imRo14agwKiQBdsI_wihLQB15wxJwZTu

PDF Q&A Chatbot

This is a PDF Chatbot application that utilizes the power of OpenAI's GPT3.5-turbo model. The chatbot is designed to interact with users and provide helpful information related to PDF files. It has a backend built with FastAPI and a frontend built with Streamlit. The entire application is containerized using Docker Compose for easy deployment and scalability.

Link: <https://github.com/naz2001r/pdf-qa-bot>

Lockdown impact on schoolers' performance in ZNO test and other possible data insights

This research helps to analyze the education level in Ukraine before and after the lockdown.

Links: https://github.com/naz2001r/zno_analysis

Books Recommendation System

The Books Recommendation Pipelines project leverages DVC to build an efficient system for recommending books. It incorporates various models and algorithms to analyze user preferences and book characteristics.

Link: https://github.com/naz2001r/recsys_project_MAUN

QUALIFICATION IMPROVEMENT

NATO Gender adviser course (GENAD)

Nordic Centre for Gender in Military Operations (NCGM), February 2025

Basic to Advanced: Retrieval-Augmented Generation (RAG)

Udemy, February 2025

LLM Engineering: Master AI, Large Language Models & Agents

Udemy, December 2024

Reinforcement Learning

MIT Professional Education, July 2024

Analysis and forecasting of time series

Robot dreams, August 2022

Machine learning,

Hillel IT school, December 2021

Python Introduction

Hillel IT school, March 2020
