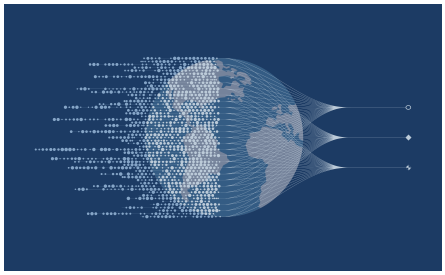

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application of artificial intelligence in exploration seismology

Recently, involving the capabilities of artificial intelligence (AI) to solve problems in exploration seismology attracted increasing interest. One example is the use of recurrent neural networks to estimate seismic activity. These networks can process time-series data, allowing to model dynamic processes through time-dependencies. Clustering to segment seismic data helps identify different rock layers and their characteristics. Regression models help in estimating rock properties based on geophysical measurements. Additionally, deep learning techniques such as convolutional neural network have been successfully applied to interpret complex geological images. Studies of the geological environment using seismic and seismological data acquire a wide scope. Modern seismic exploration faces the challenges of automating processes and increasing the reliability of results in regions with complicated geology. Specific examples illustrate the application of AI in geophysical workflows, highlighting the results in seismic processing, reservoir characterization, seismic interpretation. In this study, we attempted to conduct joint interpretation of seismic data and earthquakes to determine P- and S-wave velocity models in the South-Caspian Basin (Azerbaijan). The application of AI in geosciences opens up new opportunities for data analysis, modeling and prediction of natural phenomena. AI can significantly accelerate research processes, improve the accuracy of results and expand knowledge of the Earth.

E-mail

babayev74@gmail.com

In-person or online preference

Primary authors: Prof. BABAYEV, Gulam (Geology and Geophysics Institute, Ministry of Science and Education of Azerbaijan Republic); Mr MALIKOV, Ruslan (P:hD student)

Co-author: Mr ALIYEV, Mirzali (Geology and Geophysics Institute, Ministry of Science and Education of Azerbaijan Republic)

Presenter: Prof. BABAYEV, Gulam (Geology and Geophysics Institute, Ministry of Science and Education of Azerbaijan Republic)

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