

Earthquake prediction in Iraq using machine learning techniques

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ABSTRACT

This study deals with addressing the scientific achievements and the history of earthquake prediction in Iraq, in addition to attempting to discuss the possibility of machine learning to predict earthquakes from a theoretical perspective. The idea of predicting earthquakes gives at least a little time to protect people and reduce earthquake damage. In Iraq, we notice an increase in the occurrence of earthquakes, especially in the southern regions, where they form a strange phenomenon because they are plain areas and far from the seismic fault line, due to the errors that accompany excessive oil extraction and in random and unstudied ways, and geological studies raise fears in predicting an increase in earthquakes for the coming years. We have explored the possibility of applying machine learning technology to predict earthquakes in Iraq, and follow-up recording of tremors at different stations in Iraq through three centers of seismic sensor networks. In addition to the earthquake catalog in Iraq (1900-2019). This study may pave the way for more research to develop an integrated and accurate earthquake prediction system using machine-learning technologies.

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1. INTRODUCTION

Iraq's exposure to critical natural processes such as earthquakes, dust storms, and drought has increased. Recent studies raise fears of the increasing impact of these dangers and their imposition of many human and financial losses on Iraq in the coming years. In this study, we emphasize earthquakes and the severe and advanced capabilities in determining their location, size, driving factors, and return period, which gives the necessary information to prevent and deal with them. It is known today that knowledge of geological and geophysical indicators and an attempt to understand critical conditions can predict the probability of earthquakes to identify risks and provide rapid warnings in the direction of earthquakes.

Over the past few years, a large body of new data on Iraq's location and rates of seismic activity has become available. Furthermore, machine learning is a direct reflection of this new data. However, it also reflects a somewhat different approach to how seismic hazards are identified and how to integrate data [1] responding to the abundant seismographic data recorded in seismic monitoring equipment. Continuous efforts are being made worldwide in the hope of predicting earthquakes, as past failures constitute a significant obstacle to forecasting. On the other hand, the claim to predict earthquakes, which is theoretically impossible, is far from the truth.