'GOOGLE'S AI TO PREDICT EARTHQUAKE AFTERSHOCKS'

Relevant for: World & Indian Geography | Topic: Important Geophysical phenomena - Earthquakes, Tsunamis & Volcanoes

Large cracks from an earthquake are seen in a road in the in Pahoa, Hawaii. File | Photo Credit: AP

Scientists at Harvard University and Google have used an artificial intelligence (AI) system to analyse a database of earthquakes from around the world to predict where aftershocks might occur.

Earthquakes typically occur in sequences: an initial "mainshock" is often followed by a set of aftershocks, said Phoebe DeVries, a post-doctoral fellow at Harvard University in the US.

Although these aftershocks are usually smaller than the main shock, in some cases, they may significantly hamper recovery efforts.

Although the timing and size of aftershocks has been understood and explained by established empirical laws, forecasting the locations of these events has proven more challenging.

"We teamed up with machine learning experts at Google to see if we could apply deep learning to explain where aftershocks might occur," Ms. DeVries wrote in a Google blog post.

"We started with a database of information on more than 118 major earthquakes from around the world," she said.

From there, the team applied a neural net to analyse the relationships between static stress changes caused by the mainshocks and aftershock locations.

The algorithm was able to identify useful patterns, Ms. DeVries said.

The end result was an improved model to forecast aftershock locations and while this system is still imprecise, it is a motivating step forward, she said.

Machine learning-based forecasts may one day help deploy emergency services and inform evacuation plans for areas at risk of an aftershock.

When the researchers applied neural networks to the data set, they were able to look at the specific combinations of factors that it found important and useful for that forecast, rather than just taking the forecasted results at face value.

This opens up new possibilities for finding potential physical theories that may allow better understand of natural phenomena, they said.

"We are looking forward to seeing what machine learning can do in the future to unravel the mysteries behind earthquakes, in an effort to mitigate their harmful effects," Ms. DeVries said.

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