



Case Study: SeismicAI

Earthquake Early Warning system with a performance guarantee

The case

Earthquakes can wreak havoc on community facilities and businesses alike, disrupting operations and producing long-term impacts. Public safety and business continuity are paramount in the face of seismic threats. According to studies, an Earthquake Early Warning (EEW) system can reduce bodily injuries and non-structural damage, including those caused by fires, chemical leaks and environmental hazards, by up to 50 percent.

SeismicAI stands at the forefront of real-time seismology with its AI-enabled Earthquake Early Warning system. It provides invaluable time to help minimise loss of life and safeguard vital assets by implementing preventive measures at critical institutions such as schools, hospitals and municipal buildings, while also mitigating earthquake-induced environmental impacts.

The challenge

Traditional methods fall short in terms of accurately and rapidly detecting and alerting on earthquakes, their location and severity. Alerting is generally limited to specific regions, and is not available in many places where it is needed. This can result in either unchecked earthquake damage due to inadequate preparation, or unnecessary panic and misallocation of resources for smaller tremors. These false alarms can erode public trust and strain emergency response resources.

Most major earthquakes occur offshore, in the ocean, and in areas with a low density of sensors, often resulting in tsunamis and the destruction of nearby communities and critical facilities. In sensor-sparse areas, the alerting process of traditional systems takes too long, as these systems require triggering of four stations, which significantly slows the process.

Furthermore, determining the precise location of the earthquake is critical for calculating its effects on any specific point. With traditional systems, in areas outside the seismic network, the ability to precisely detect the earthquake's location steeply diminishes as the distance from the network grows – and distance errors cause magnitude errors, distorting the warning's accuracy.

The solution

SeismicAI's regional algorithm utilises patented array seismology, which allows earthquake locations to be accurately and rapidly determined anywhere in the world, including offshore.

SeismicAI's arrays (local clusters of four sensors) can locate an earthquake's hypocentre and estimate its magnitude and impact on various sites, with much higher accuracy than traditional solutions.

SeismicAI's array seismology substantially accelerates the alerting process. Adding a single array to sensor-sparse regions dramatically reduces the response time, as the triggering of the array and a single station are sufficient to locate the hypocenter and initiate the process; SeismicAI's array technology determines the earthquake's location using only two stations rather than four. SeismicAI utilises cutting-edge proprietary technologies based on seismological research, machine learning, deep learning and data analysis.

SeismicAI's rapid and accurate alerting allows more time for lifesaving and damage prevention measures. The solution minimises loss of life and physical damage, while also helping companies get back to business faster.

Depending on customer preferences, the system can be used to automatically trigger emergency responses and capabilities. SeismicAI's solution enables damage mitigation for public safety and business continuity for a variety of customers in areas like manufacturing; mines; oil, gas and chemicals; and commercial real estate, as well as utilities and civil organisations.

SeismicAI's system can be operational within weeks, anywhere in the world, and can be seamlessly integrated into existing seismic networks, upgrading them to real-time seismology networks.

On the guarantee

Reflecting SeismicAI's confidence in the reliability, robustness and accuracy of its solution, the company provides its customers with a performance guarantee for its Earthquake Early Warning system.

For this purpose, SeismicAI has partnered with a Munich Re Group company, which conducted due diligence on the machine learning model's performance and has issued an insurance policy for SeismicAI, addressing its liabilities arising from the guarantee.

With a unique performance guarantee provided by Munich Re, SeismicAI is the only earthquake alert system backed by a reinsurance company¹.

About Munich Re

Munich Re is one of the world's leading providers of reinsurance, primary insurance and insurance-related risk solutions. Since it was founded in 1880, Munich Re has been known for its unrivalled risk-related expertise and its sound financial position. It offers customers financial protection when faced with exceptional levels of damage. Munich Re possesses outstanding innovative strength. The company is playing a key role in driving forward the digital transformation of the insurance industry, and in doing so has further expanded its ability to assess risks and the range of services that it offers. The insurance is underwritten by a primary insurance carrier of the Munich Re Group, which is an S&P AA- rated international insurance company.

¹ The specific terms and conditions (including coverage and limitations) can be found in the Policy Issued to SeismicAI.

About SeismicAI

SeismicAI, founded in 2014, is a provider of innovative Earthquake Early Warning (EEW) systems. SeismicAI's EEW-as-a-service solutions can accurately detect and alert on earthquakes anywhere in the world. Its patented regional algorithms utilise local sensors to issue high-precision alerts for disaster preparedness.

By providing more time for preventive actions, whether triggered automatically or manually, SeismicAI can offer organisations considerable financial savings. The company's solutions support business continuity and disaster preparedness for firms and public organisations alike. They can reduce injuries and casualties, mitigate insurance risk, and prevent fires, explosions and environmental damage, potentially reducing non-structural damage by up to 50%.

The system covers the full early warning cycle – from monitoring and reporting, to alerts, optionally triggering automated preventive actions.

SeismicAI's early alert technology was developed by leading seismologists and business professionals.

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