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Information Technology; Recent Findings in Information Technology Described by a Researcher from University of Texas Austin (Enhancing earthquake detection from distributed acoustic sensing data by coherency measure and moving-rank-reduction filtering)

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2023 MAY 23 (VerticalNews) -- By a News Reporter-Staff News Editor at Information Technology Newsweekly -- Investigators discuss new findings in information technology. According to news reporting out of Austin, Texas, by VerticalNews editors, research stated, "Distributed acoustic sensing (DAS) enables the recording of earthquake signals at an unprecedented low cost with strong environmental resistance using fiber optic cables."

Our news correspondents obtained a quote from the research from University of Texas Austin: "It often is compromised by relatively lower data quality in single-channel measurements compared with traditional seismic receivers but compensated by high-density recordings from hundreds of channels per earthquake event. The multichannel nature of DAS data sets facilitates the applications of well-developed coherency-based denoising methods arising from reflection seismology for detecting more earthquakes. We first introduce a coherency measure for detecting earthquake signals from DAS data sets. Then, we propose to apply a moving-rank-reduction (MRR) filter to enhance the DAS data quality so as to improve the earthquake detectability. The MRR filter is tailored from a rank-reduction filter that is widely used in processing multichannel reflection seismic data. We find that a simple band-pass or median filter is incapable of revealing weak signals generated from small-magnitude or far-away earthquake events, whereas the MRR filter significantly improves the signal-to-noise ratio that enables the detection of those weak signals."

According to the news reporters, the research concluded: "We apply the MRR method and the coherency measure on the San Andreas Fault Observatory at Depth DAS data sets for denoising and earthquake detection. As a result, our framework detects all 31 cataloged events, outperforming the previous detection of 25 events using the same data set."

For more information on this research see: Enhancing earthquake detection from distributed acoustic sensing data by coherency measure and moving-rank-reduction filtering. GEOPHYSICS, 2023. The publisher for GEOPHYSICS is Society of Exploration Geophysicists.

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Our news editors report that more information may be obtained by contacting Yangkang Chen, University of Texas Austin, **Bureau of Economic Geology**, Austin, Texas, United States. Additional authors for this research include Alexandros Savvaidis, Yunfeng Chen, Omar M. Saad, Sergey Fomel.

Keywords for this news article include: University of Texas Austin, Austin, Texas, United States, North and Central America, Geophysics, Information Technology.

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