
Physics - Geophysics; Studies from University of Texas Austin Provide New Data on Geophysics (Joint deblending and source time inversion)

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2022 JUL 12 (VerticalNews) -- By a News Reporter-Staff News Editor at Physics Week -- Investigators discuss new findings in geophysics. According to news reporting from Austin, Texas, by VerticalNews journalists, research stated, "The simultaneous source technique has been widely applied in seismic field acquisition and has achieved great success in the past decade."

The news journalists obtained a quote from the research from University of Texas Austin: "Many studies have shown that inversion-based source-separation algorithms are more robust than filtering-based methods. However, inversion-based methods depend on accurate shot times. Here, we tackle the long-standing issue of the shot times being inaccurate or unavailable during iterative inversion by proposing a joint inversion framework to simultaneously separate the blended sources and invert for the shot time. We formulate a non-linear inverse problem that contains two unknowns, i.e., the unblended data and the shot time vector, and we propose a Gauss-Newton method to iteratively invert the shot time vector given an estimate of the unblended data. Then, the estimated shot time vector is fixed for iterative source-separation following a traditional deblending framework. The two aforementioned steps are recursively implemented until they converge or reach a maximum number of iterations."

According to the news reporters, the research concluded: "We demonstrate the proposed method through several synthetic and field data examples. Results show that the proposed joint inversion framework is effective and the low-frequency component matters during the non-linear inversion of the shot time vector."

For more information on this research see: Joint deblending and source time inversion. GEOPHYSICS, 2022. The publisher for GEOPHYSICS is Society of Exploration Geophysicists.

A free version of this journal article is available at <https://doi.org/10.1190/geo2022-0149.1>.

Our news editors report that additional 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 Sergey Fomel, Ray Abma.

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