Science - Environmental Science and Technology; University of Texas Austin Reports Findings in Environmental Science and Technology (DeepSense: A Physics-Guided Deep Learning Paradigm for Anomaly Detection in Soil Gas Data at Geologic CO2 Storage Sites)

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2021 NOV 9 (VerticalNews) -- By a News Reporter-Staff News Editor at Journal of Mathematics -- New research on Science - Environmental Science and Technology is the subject of a report. According to news reporting originating from Austin, Texas, by VerticalNews correspondents, research stated, "Driven by the collection of enormous amounts of streaming data from sensors, and with the emergence of the internet of things, the need for developing robust detection techniques to identify data anomalies has increased recently. The algorithms for anomaly detection are required to be selected based on the type of data."

Funders for this research include Jackson School of Geosciences, University of Texas at Austin, **Bureau of Economic Geology**.

Our news editors obtained a quote from the research from the University of Texas Austin, "In this study, we propose a predictive anomaly detection technique, DeepSense, which is applied to soil gas concentration data acquired from sensors being used for environmental characterization at a prospective CO storage site in Queensland, Australia. DeepSense takes advantage of deep-learning algorithms as its predictor module and uses a process-based soil gas method as the basis of its anomaly detector module. The proposed predictor framework leverages the power of convolutional neural network algorithms for feature extraction and simultaneously captures the long-term temporal dependency through long short-term memory algorithms. The proposed process-based anomaly detection method is a cost-effective alternative to the conventional concentration-based soil gas methodologies which rely on long-term baseline surveys for defining the threshold level. The results indicate that the proposed framework performs well in diagnosing anomalous data in soil gas concentration data streams."

According to the news editors, the research concluded: "The robustness and efficacy of the DeepSense were verified against data sets acquired from different monitoring stations of the storage site."

This research has been peer-reviewed.

For more information on this research see: DeepSense: A Physics-Guided Deep Learning Paradigm for Anomaly Detection in Soil Gas Data at Geologic CO2 Storage Sites. Environmental Science & Technology, 2021. Environmental Science & Technology can be contacted at: Amer Chemical Soc, 1155 16TH St, NW, Washington, DC 20036, USA. (American Chemical Society - www.acs.org; Environmental Science & Technology - www.pubs.acs.org/journal/esthag)

The news editors report that additional information may be obtained by contacting Katherine Romanak, **Bureau of Economic Geology**, Jackson School of Geosciences, University of Texas Austin, Austin, Texas 78758-4445, United States.

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