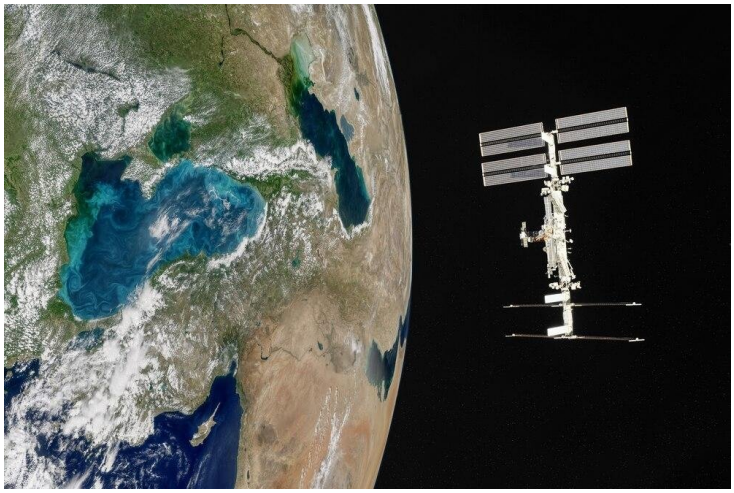
AgroSpectrum ASIA
Envisaging Future | Updating Present

Scientists develop AI models able to predict future drought conditions with high accuracy

24 September 2024 | News

AI is slated to alleviate disastrous effects of drought and its aggravating economic and social consequences



AI is slated to alleviate disastrous effects of drought and its aggravating economic and social consequences

Scientists at University of Sharjah have developed new AI models with the ability to predict future drought conditions with almost unerring accuracy. Research highlights the substantial advantages of using AI models over conventional drought indices in predicting the causes and onslaught of conditions leading to scarcity of rain and water.

The innovative AI tool the authors develop is even designed to aid in better resource allocation, agricultural planning, and disaster management, ensuring that water and food security are not compromised as climate changes intensify.

â??The results were promising. The AI models were able to predict future drought conditions with high accuracy. The AI models demonstrated strong correlations with multiple drought indicators and consistently outperformed existing indices, said Dr. Mohamed Abdallah, University of Sharjahâ??s Associate Professor of Civil Engineering, and the studyâ??s lead author.

The researchâ??s significance lies in its potential to enable authorities to monitor the drought and provide proper response strategies. The authors integrated AI into drought prediction, providing what they present as more reliable forecasts than hitherto available. The tools is known to be a reliable drought forecasts to the complex nature of the phenomenon and varying hydroclimatic conditions.

â??As a result of the inherent complexity of drought phenomena and hydroclimatic condition differences, no universal drought index is available for effectively monitoring drought across the world. Therefore, this study aimed to develop a new meteorological drought index to describe and forecast drought based on various artificial intelligence (AI) modelsâ? adds Dr.

Abdallah.

The authors underscore in their study the limitations of traditional drought indices. To identify these drawbacks, they trained several advanced artificial intelligence (AI) models using historical climate data and soil moisture levels to enhance drought prediction accuracy.

â??We compared the developed AI-based indices with multiple conventional drought indices based on their correlations with various drought indicators. Our AI models proved to be particularly efficient in capturing extreme climatic changes, with enhanced forecasting accuracy. This capability is vital in regions where increasing water scarcity and more severe climatic fluctuations pose significant challenges. Our AI models can help in planning water resources more efficiently and mitigating the impacts of droughts on ecosystems.â?• said Dr. Abdallah.

Implementing this data-driven approach is predicted to significantly allow better adaptation to the challenges posed by climate change, particularly in regions most susceptible to its effects. The research substantiates that AI can be a powerful tool in drought assessment, potentially paving the way for more effective and proactive management strategies on how to combat water scarcity.

â??By integrating AI into drought monitoring, we offer a transformative approach that enhances decision-making in resource allocation, critical for regions facing persistent water scarcity,â?• said Dr. Abdullah Yilmaz, a senior lecturer at the Australian La Trobe Universityâ??s School of Computing, and a co-author.