EGU24 Media Tip Sheet: Uses of AI in Earth and environmental science

What place does artificial intelligence (AI) have in Earth and environmental science? As it turns out, AI—which includes machine learning, neural networks, deep learning (machine learning models that use neural networks), and other buzzwords—can be extremely helpful for studying large datasets. In these presentations, researchers discuss ways to use AI-based models to efficiently screen large datasets to help with science that's directly applicable to the world, ranging from searching for trapped victims in disasters to finding and monitoring plastic litter on beaches.

Convective environments in AI-models - What have AI-models learned about atmospheric profiles?

Researchers assess the performance of different AI-based weather forecasting models, with a focus on the North American and European 2020 convective seasons. In particular, they look at the example of a U.S. tornado outbreak, with all models predicting indicators of high energy in advance. This work lays the foundation for hazard-driven AI-based forecasting.

Mon, 15 Apr, 14:35–14:45 CEST, Room 0.11/12

Session AS1.2

Evaluating the Impact of Armed Conflict on Agricultural Sector in Ukraine through Remote Sensing and Machine Learning

War has negatively impacted Ukraine's agricultural sector because of shelling, explosions and landmines, raising concerns about food security. Remote sensing methods, combined with machine learning, can help automatically detect damaged fields in near real-time. This information is useful for both adaptation of the global food supply and restoration in Ukraine.

Mon, 15 Apr, 15:15–15:25 CEST, Room 1.34

Session ITS3.2/ERE6.12

The Need for Utilizing AI in Locating Trapped Victims Following Earthquakes and Floods

In search and rescue missions after disasters like earthquakes and floods, uncrewed equipment such as cameras, acoustic sensors, and cellular receivers can help save lives. This work considers the operational process of locating victims, and argues that employing AI to rapidly explore these datasets is necessary.

Tues, 16 Apr, 08:45–08:55 CEST, Room 0.15

Session NH6.7

Application of shallow geophysical methods and machine learning for detecting remains of early medieval settlements in south-eastern Poland

Poland has a deep agricultural history, with intricate and expansive layouts posing challenges for archaeologists to explore. Employing deep learning neural networks to examine airborne laser scanning data may automate identification of archeological sites.

Wed, 17 Apr, 16:22–16:24 CEST, PICO spot 2, PICO2.2

Session GM5.4

Simulating and analysing seabird flyways: An approach combining least-cost path modelling and machine learning

Seabirds migrate along distinct “flyways” driven by Earth’s large-scale atmospheric circulation patterns. In this work, researchers use climate data to simulate these corridors. Combining bird tracking data with machine learning, they infer whether the flyways optimize for time and energy, and show that a bird’s effort is influenced by tailwinds, crosswinds and food.

Wed, 17 Apr, 16:30–16:32 CEST, PICO spot 1, PICO1.2

Session ITS3.5/BG1.19

AI-driven aerial drones and monitoring app: New developments to facilitate citizen science initiatives on plastic pollution monitoring and clean-ups on beaches

The Mediterranean Sea teems with plastic litter attributed to dense populations and tourism. Here, scientists use artificially intelligent drones to detect plastic hotspots on beaches. An app tracks community-led efforts for monitoring and cleanup. In turn, images from these efforts train the deep learning algorithm to recognize even more plastics.

Thurs, 18 Apr, 08:49–08:51 CEST, PICO spot 2, PICO2.8

Session ITS3.24/HS12.9