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AI:10

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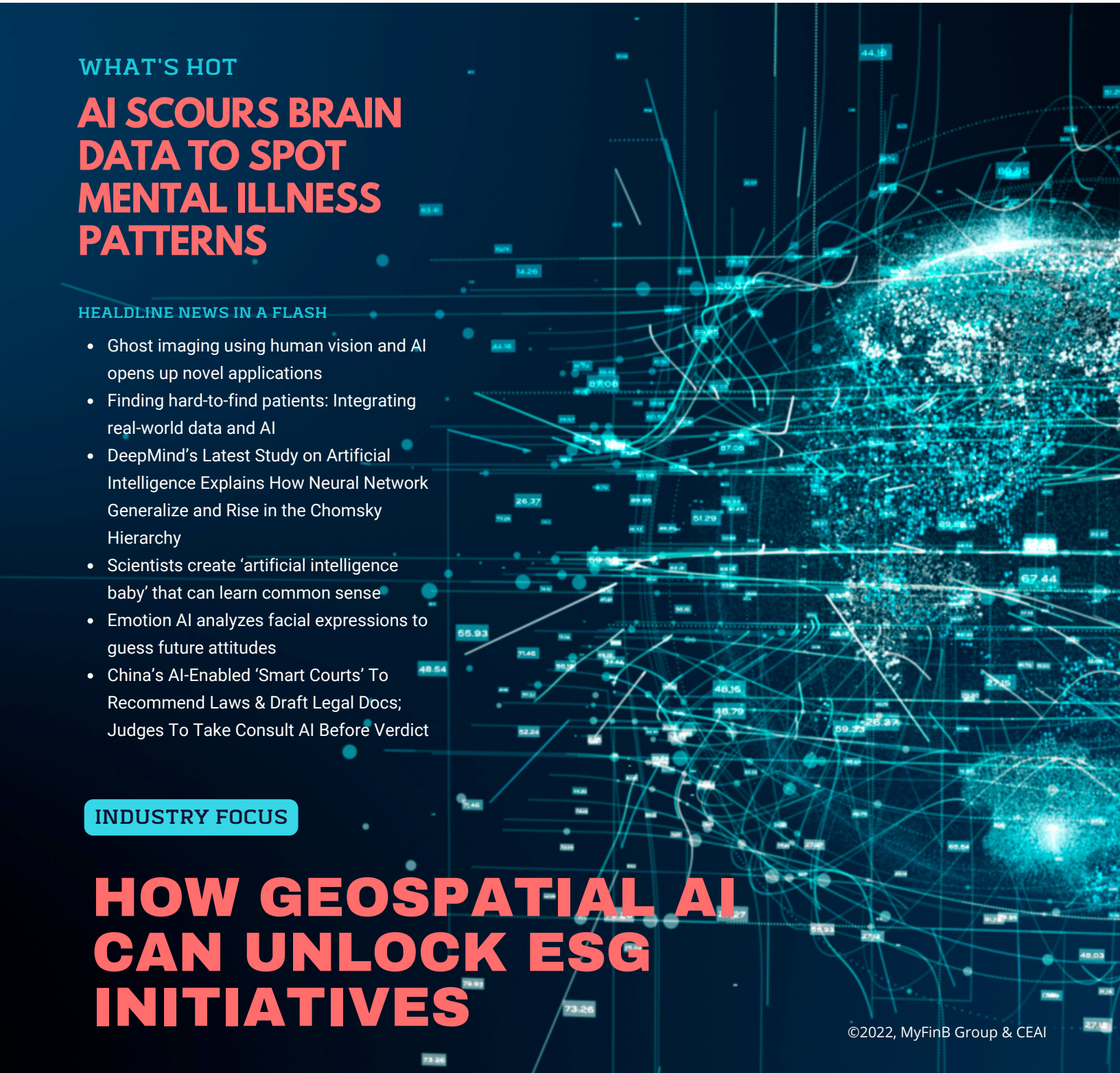

WHAT'S HOT

AI SCOURS BRAIN DATA TO SPOT MENTAL ILLNESS PATTERNS

HEALDLINE NEWS IN A FLASH

- Ghost imaging using human vision and AI opens up novel applications
- Finding hard-to-find patients: Integrating real-world data and AI
- DeepMind's Latest Study on Artificial Intelligence Explains How Neural Network Generalize and Rise in the Chomsky Hierarchy
- Scientists create 'artificial intelligence baby' that can learn common sense
- Emotion AI analyzes facial expressions to guess future attitudes
- China's AI-Enabled 'Smart Courts' To Recommend Laws & Draft Legal Docs; Judges To Take Consult AI Before Verdict

INDUSTRY FOCUS

HOW GEOSPATIAL AI CAN UNLOCK ESG INITIATIVES

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AI SCOURS BRAIN DATA TO SPOT MENTAL ILLNESS PATTERNS

Even if we know from other testing or family history that someone is at risk of a disorder such as Alzheimer's, we are still unable to predict when exactly it will occur," Vince Calhoun says. "Brain imaging could narrow down that time window, by catching the relevant patterns when they do show up before clinical disease is apparent.

New research may lead to early diagnosis of devastating conditions such as Alzheimer's disease, schizophrenia, and autism—in time to help prevent and more easily treat these disorders.

As reported in Nature Scientific Reports, researchers built a sophisticated computer program that is able to comb through massive amounts of brain imaging data and discover new patterns linked to mental health conditions.

The brain imaging data came from scans using functional magnetic resonance imaging (fMRI), which measures dynamic brain activity by detecting tiny changes in blood flow.

"We built artificial intelligence models to interpret the large amounts of information from fMRI," says lead author Sergey Plis, associate professor of computer science and neuroscience at Georgia State University.

Plis compares this kind of dynamic imaging to a movie—as opposed to a snapshot such as an x-ray or, the more common structural MRI—and notes "the available data is so much larger, so much richer than a blood test or a regular MRI. But that's the challenge—that huge amount of data is hard to interpret."

In addition, fMRI's on these specific conditions are expensive, and not easy to obtain. Using an artificial intelligence model, however, regular fMRI's can be data mined. And those are available in large numbers.

"There are large datasets available in individuals without a known clinical disorder," says coauthor Vince Calhoun, founding director of the TReNDS Center at Georgia State.

Using these large but unrelated available datasets improved the model's performance on smaller specific datasets. "New patterns emerged that we could definitively link to each of the three brain disorders," Calhoun says.

The researchers first trained the AI models on a dataset including over 10,000 people to learn to understand basic fMRI imaging and brain function. The researchers then used multi-site data sets of over 1,200 people including those with autism spectrum disorder, schizophrenia, and Alzheimer's disease.

How does it work? It's a bit like Facebook, YouTube, or Amazon learning about you from your online behavior, and beginning to be able to predict future behavior, likes, and dislikes. The computer software was even able to home in on the "moment" when the brain imaging data was most likely linked to the mental disorder in question. To make these findings clinically useful, they will need to be applied before a disorder manifests.

"If we can find markers for and predict Alzheimer's risk in a 40-year-old," Calhoun says, "we might be able to do something about it."

Similarly, if schizophrenia risks can be predicted before there are actual changes in brain structure, there may be ways to offer better or more effective treatments. "The vision is that we collect a large imaging dataset, our AI models pore over it, and show us what they learned about certain disorders," Plis says. "We are building systems to discover new knowledge we could not discover on our own."

"Our goal," says first author Md Mahfuzur Rahman, a doctoral student in computer science, "is to bridge big worlds and big datasets with small worlds and disease-specific datasets and move towards markers relevant for clinical decisions."

Startup funds to SMP and the National Institutes of Health supported the work.

Source: futurity.org

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HEALDLINE NEWS IN A FLASH

GHOST IMAGING USING HUMAN VISION AND AI OPENS UP NOVEL APPLICATIONS

Most rugby players know that in rugby, it is important to run towards where the ball is going to be, not where it has been. Similarly, great leaders have the ability to see around corners (what is coming next) in business and know how to harness disruptive influences to give their company a strategic advantage. Seeing around corners or recognising and acting on disruptive inflection points before they happen has become an important part of the implementation of strategy in a world of technological innovation. LIDAR (Light Detection and Ranging) technology is a more electronic way of seeing around corners. LIDAR uses a pulsed laser firing at nano-second speeds to record the time it takes for the signal to return to the source, thus enabling a computer to generate a three-dimensional (3D) model with great accuracy.

Source: IOL

DEEPMIND'S LATEST STUDY ON ARTIFICIAL INTELLIGENCE EXPLAINS HOW NEURAL NETWORK GENERALIZE AND RISE IN THE CHOMSKY HIERARCHY

A DeepMind research group conducted a comprehensive generalization study on neural network architectures in the paper 'Neural Networks and the Chomsky Hierarchy', which investigates whether insights from the theory of computation and the Chomsky hierarchy can predict the actual limitations of neural network generalization. They demonstrated that more significant quantities of training data do not permit generalization on tasks further up in the hierarchy for various architectures, possibly suggesting rigid restrictions for scaling rules. They showed how architectures with differentiable organized memory, like a tape or a stack, may tackle higher-level problems. The DeepMind study delivers a comprehensive empirical analysis of various models concerning the Chomsky hierarchy.

Source: Marktechpost

EMOTION AI ANALYZES FACIAL EXPRESSIONS TO GUESS FUTURE ATTITUDES

More and more businesses are moving into an era wherein artificial intelligence (AI) is a component of every new initiative. One such tool called emotion AI analyzes facial expressions based on a person's faceprint to find their goals, attitudes, and interior emotions. **THE BASIC EMOTIONS THEORY -** The "basic emotions" theory, which asserts that people all over the world express the same six basic internal emotional states (happiness, surprise, fear, disgust, anger, and sadness) through their facial expressions, which are influenced by our biological and evolutionary origins, is the foundation of this application, which is also known as emotion AI or affective computing. Emotion AI is an emerging technology that "allows a computer and systems to identify, process, and simulate human feelings and emotions," according to a recent report by tech industry research firm AIMultiple.

Source: Dataconomy.com/

FINDING HARD-TO-FIND PATIENTS: INTEGRATING REAL-WORLD DATA AND AI

Identifying patients 'outside the clinic' can provide significant benefits for researchers and population health managers. Accurately, reliably identifying patients can be tremendously beneficial but can also be very difficult without the right tools and approach. Cases where standardized coding does not exist, or operational definitions are difficult to implement broadly, can prevent isolation of cohorts of interest and the insights that follow. Working strategically with the right kinds of real-world data and AI tools, and iterating for improvement, can answer questions not feasible before these tools were available. A patient identification challenge that may have seemed impossible may actually be solvable now - and if the insights to be gained can help improve outcomes, it's worth trying.

Source: Biopharmadive

SCIENTISTS CREATE 'ARTIFICIAL INTELLIGENCE BABY' THAT CAN LEARN COMMON SENSE

Scientists have created an artificial intelligence that is able to think and learn like a baby. The system is able to grasp the basic common sense rules of the world in the same way as humans can, the researchers who create it say. The breakthrough could not only help advance AI research but also the ways we understand the human mind, scientists say. Children's minds are particularly interesting to AI researchers, since they are able to grasp rules and common sense in a way that remains largely mysterious. Researchers have suggested that computers could be successful in mimicking this system, and that it might be better to simulate a child's brain and teach it rather than attempting to copy the workings of the adult mind. One of their capabilities is "intuitive physics" – the knowledge we have about how things interact that comes to us at an early age.

Source: Independent.co.uk

CHINA'S AI-ENABLED 'SMART COURTS' TO RECOMMEND LAWS & DRAFT LEGAL DOCS; JUDGES TO TAKE CONSULT AI BEFORE VERDICT

China has been working to build a 'smart court' system since at least 2016 by incorporating Artificial Intelligence (AI) into its justice system. The new system requires the judges to consult AI on each case, and if they reject the AI's recommendation, they must provide a written explanation. This new system, the 'Smart Court SoS (System of Systems),' is connected to the desk of every working judge across the country, according to Xu Jianfeng, who heads the information center of China's Supreme People's Court in Beijing. "The wide application of the smart court system has made a significant contribution to the judicial advancement of human civilization," Xu said in a report published on June 12 in Strategic Study of CAE, an official journal run by the Chinese Academy of Engineering. The machine learning (ML) system can automatically scan court cases for references, recommend laws and regulations to the judge, draft legal documents and rectify what it sees as human errors in a verdict.

Source: EurasianTimes

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HOW GEOSPATIAL AI CAN UNLOCK ESG INITIATIVES

The use of geospatial data to inform business decisions dates back to the 1960s. Using computers and computational geography, businesses were able to leverage some of the earliest geospatial data available to determine resourcing opportunities and the potential for geographic expansions. In 2022, this technology has dramatically evolved, enabling businesses to leverage AI to further analyze available geographic information systems (GIS) data to uncover trends and predictions otherwise unavailable. With the increase of data available, businesses are also using GIS to help inform their Environmental, Social, and Governance (ESG) initiatives.

Every business is deeply intertwined with environmental, social, and governance (ESG) matters. As the climate change crisis continues to worsen and both consumers and employees demand more transparency at every level, the importance of a business having strong ESG initiatives has never been more important. In fact, studies have already shown that companies with a strong ESG proposition are linked to higher value creation.

While the US does not have mandatory ESG disclosures at the federal level, the SEC requires all public companies to disclose information that may be material to investors, including information on ESG-related risks. Consumers are also demanding more transparency from companies, as climate impact is top of mind for many people. While standardized reporting and metrics don't exist in the US yet around ESG reporting, businesses are already taking the first step to accelerate these reporting requirements. When ESG initiatives are evaluated with the right data, companies can score themselves against energy use, usage and stewardship of natural resources, cybersecurity, conservation practices, and the treatment of employees.

This is where AI-supported geospatial data can be useful for many businesses reporting on their ESG initiatives. ESG reports informed by geospatial AI can help businesses validate and back into their initiative's claims with reproducible, material proof. This additional level of insight, captured in real-time and rich with detail, can help investors correlate financial capital spending to a company's social and natural capital. In short, this data will serve to help investors and consumers hold businesses accountable for their actions as they relate to global economic and environmental stability. Understanding how geospatial data can inform ESG reporting is one step in helping companies establish their initiatives and create clear plans of action to maintain transparency and accountability for these efforts.

The impact of geospatial AI on environmental reporting

Geospatial data supported by AI is the next evolution of data for businesses and organizations trying to truly understand the environmental impact of their commercialization. One example of this that we've seen at iMerit Technology comes from a project involving training AI algorithms to detect abandoned mines. While satellite imagery of these locations exists, it is nearly impossible and extremely time-consuming for researchers to scan thousands of images to identify abandoned mines while comparing them against historical data of what the land or region looked like before, during, and after mining operations. Oftentimes, researchers, government agencies, and companies may not even have access to historical data to drive this research, which leaves large gaps in factual reporting. This is where AI comes in. In this example, AI algorithms can be trained to comb through high volumes of satellite data and detect abandoned mines using high-quality GIS training data, and this information can then be used to evaluate the ongoing changes to the environment caused by the mines, even long after they have been out of use. This information can help governments, companies, and

Source: Cointelegraph

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organizations make more informed decisions about future mining operations and measure the impact mines have on the environment when they are no longer functional. The global metals and mining industry contributes to approximately 8% of the global carbon footprint. When thinking about establishing proactive environmental initiatives, geospatial data can inform industries about the impact of resourcing. This information will ultimately drive companies to make more sustainable decisions that protect the environment.

Geospatial AI can hold companies socially accountable to their ESG initiatives

Geospatial data isn't the first source of information that comes to mind for executives when determining how to measure and evaluate social impact. However, these datasets can help companies monitor their supply chain from beginning to end via satellite imagery that's supported by AI analysis. Using this data, companies have the purview to see every stage of their supply chain cycle from resourcing to shipping, and can look even further to ensure that ethical labor practices are maintained. This level of precision enables organizations and companies to hold partners accountable and have viable data to do so.

By using AI algorithms, companies can get instant alerts on violations in their supply chain cycle and act quickly. This can be extremely critical in the case of illegal deforestation or human trafficking. In 2015, the Environmental Justice Foundation leveraged geospatial data to help inform their evidence of illegal human trafficking and enslavement of Thai fishermen. Other groups like the Humanitarian OpenStreetMap Team use geospatial data to work on multiple projects, including water and sanitation, gender equality, poverty elimination, disaster response, and numerous others. With the next iteration of GIS and AI, these organizations can use algorithms to detect these injustices at scale and get information quickly to assemble appropriate solutions.

With AI, companies can leverage algorithms to draw richer insights and conclusions from satellite imagery or other remote-sensing datasets to illustrate how company objectives directly impact the environment. This may include reviewing geospatial data against customer satisfaction, production performance, retention, and capital spending.

Governance supported by standardized geospatial AI

Evaluating performance on ESG initiatives is no longer a nice to have for companies. As mentioned earlier, this reporting is becoming standard for the public and regulators. When it comes to governance factors, companies need to ensure that reports are backed by material data. In the case of geospatial data, reporting should include not only satellite imagery or GIS databases, but the practical action and company circumstances that lead to the conditions reported. With AI, companies can leverage algorithms to draw richer insights and conclusions from satellite imagery or other remote-sensing datasets to illustrate how company objectives directly impact the environment.

It's not a matter of if ESG reporting will become reliant on geospatial AI, but rather a matter of time before all companies leverage this technology to inform their ESG reporting. The level of detail and insights provided from AI-powered datasets will position companies in the most proactive position possible to seriously address climate change.

This may include reviewing geospatial data against customer satisfaction, production performance, retention, and capital spending. Geospatial data can also support the development of predicted scenarios that can help companies mitigate climate risks. Because geospatial is tangible and traceable data, companies are empowered to make concrete decisions from the insights obtained. This is especially helpful in the use of digital twins, a method used by companies to replicate a virtual model of their facilities. The additional information developed from AI-driven geospatial data allows them to strategize and plan through scenarios to prepare for worst and best case situations. It's not a matter of if ESG reporting will become reliant on geospatial AI, but rather a matter of time before all companies leverage this technology to inform their ESG reporting. The level of detail and insights provided from AI-powered datasets will position companies in the most proactive position possible to seriously address climate change. Geospatial information alone provides only some of the insights companies need to formulate stronger ESG initiatives. When adding AI to the mix, we can truly address the gaps within information and even uncover information that will impact climate and social change.

Source: Venture Beat

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