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AI:10

GET INSIGHTS ON AI UNDER 10 MINUTES

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WHAT'S HOT

NEURAL NETWORKS BEHIND SOCIAL MEDIA CAN CONSUME AN INFINITE AMOUNT

An Interview on

SOCIAL INNOVATION

- Tan Yet Mee

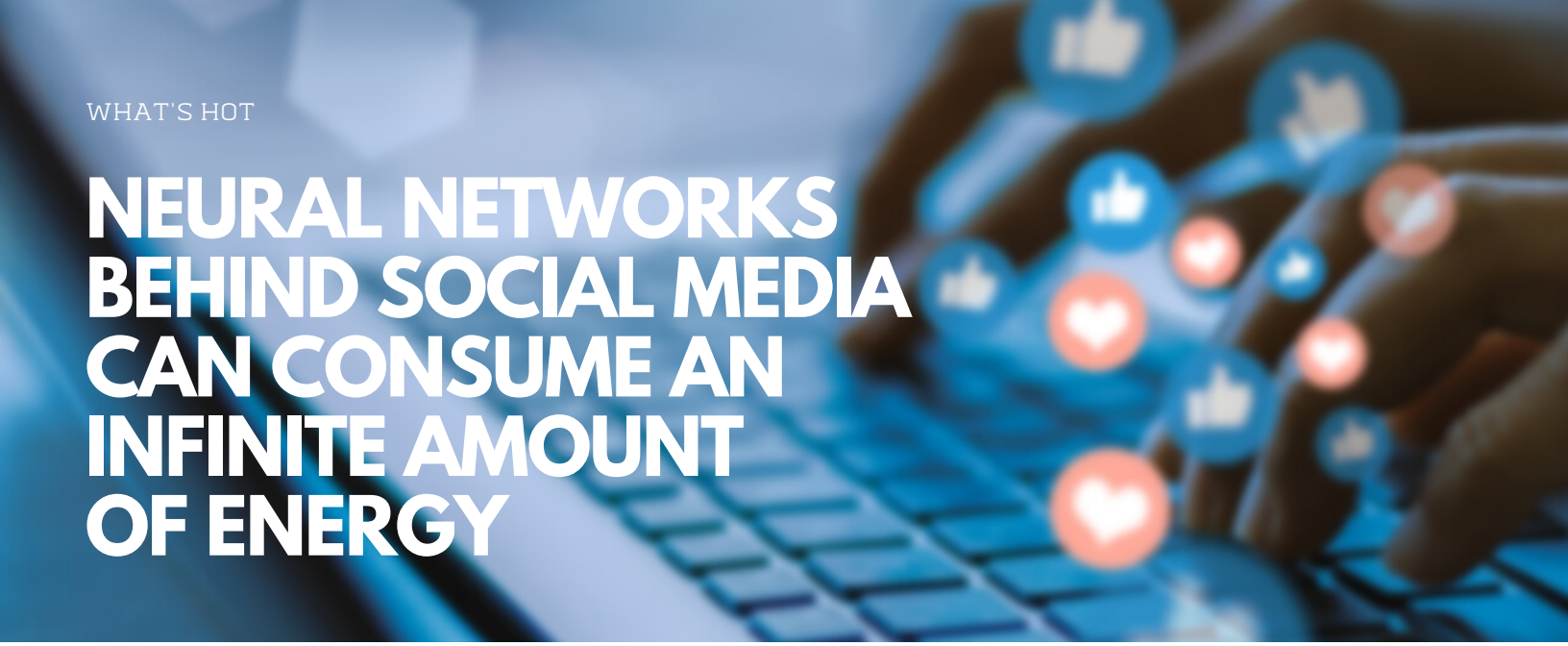
HEADLINE NEWS IN A FLASH

- Google ML can help discover new antibodies, enzymes, foods
- General Atomics' Gambit autonomous combat drone takes the initiative
- AI predicts algae potential as alternative energy source
- New Zealand to Set Ethical Artificial Intelligence Strategy
- Qualcomm embeds artificial intelligence into latest 5G processor to boost speeds and signal coverage
- Abu Dhabi students develop AI-powered solution for food security, reducing waste

INDUSTRY FOCUS

HOW VISUAL DATA IS PROPELLING A NEW WAVE OF CLIMATE TECH

NEURAL NETWORKS BEHIND SOCIAL MEDIA CAN CONSUME AN INFINITE AMOUNT OF ENERGY



Artificial neural networks are brain-inspired computing systems that can be trained to solve complex tasks better than humans.

These networks are frequently used in social media, streaming, online gaming and areas where users are targeted with posts, movies, fun games or other content that matches their individual preferences. Elsewhere, neural networks are used in health care to recognize tumors on CT scans, among other things.

While the technology is incredibly effective, a Danish researcher behind a new study believes that it should not be misused. The study's authors have demonstrated that all of the world's energy could be used to train a single neural network without ever achieving perfection.

"The problem is that an infinite amount of energy can be used to, for example, train these neural networks just to target advertisements at us. The network would never stop training and improving. It's like a black hole that swallows up whatever energy you throw at it, which is by no means sustainable," explains Mikkel Abrahamsen, an assistant professor at the University of Copenhagen's Department of Computer Science.

Therefore, this technology should be deployed wisely and carefully considered before every use, as simpler, more energy-efficient solutions may suffice. Abrahamsen elaborates:

"It's important for us to consider where to use neural networks, so as to provide the greatest value for us humans. Some will see neural networks as better suited for scanning medical imagery of tumors than to target us with advertising and products on our social media and streaming platforms. In some cases, one might be able to do with less resource-intensive techniques, like regression tasks or random decision forests."

AN ENDLESS TRAINING

Neural networks are trained by feeding them data. This could be the scanned images of tumors, through which a neural network learns to spot cancer in a patient.

In principle, such training can continue indefinitely. In their new study, the researchers demonstrate that this is a bottomless pit, because the process becomes like solving highly advanced equations with many unknowns.

"Today's best algorithms can only manage up to eight unknowns, while neural networks can be set up to consider several billion parameters. Therefore, an optimal solution might never be found while training a network, even if the world's entire energy supply were to be used," explains Mikkel Abrahamsen.

Neural networks become progressively worse at using the energy provided to them.

"Things get slower and slower as we train neural networks. For example, they can attain 80 percent accuracy after one day, but an entire month more to reach 85 percent. So, one gets less and less out of the energy used in the training, while never achieving perfection," he says.

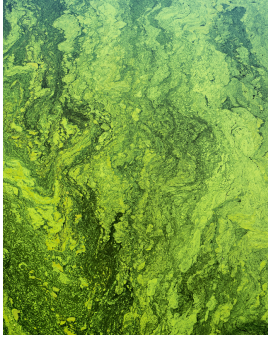
Many people don't realize that networks can be trained indefinitely, which is why Abrahamsen thinks that we need to focus on their heavy appetite for power.

"We don't appreciate our contribution towards this enormous use of energy when we log on to Facebook or Twitter, when compared, for example, to our awareness about the impacts of intercontinental flights or clothing purchases. So, we should open our eyes to the degree to which this technology pollutes and affects our climate," Abrahamsen concludes.

What is a neural network?

- *A neural network is a machine learning model inspired by neuron activity in the human brain that can be trained to perform complex tasks at extremely efficient superhuman levels.*
- *Neural networks have lots of parameters that need to be adjusted for them to provide meaningful output – a process called training.*
- *Neural networks are typically trained using an algorithm known as backpropagation, which gradually adjusts parameters in the right direction.*

Source: thebrighterside

GOOGLE ML CAN HELP DISCOVER NEW ANTIBODIES, ENZYMES, FOODS

Alphabet (Google's parent company) subsidiary DeepMind has shown that Machine Learning (ML) can predict the shape of protein machinery with unprecedented accuracy, paving the way for researchers to discover new antibodies, enzymes and foods. DeepMind worked closely with internationally recognised experts at the EMBL's European Bioinformatics Institute (EMBL-EBI) to annotate 6.8 million more protein regions in the 'Pfam v34.0 database' release, a global repository for protein families and their function. According to researchers, combining deep models with existing methods significantly improves remote homology detection, suggesting that the deep models learn complementary information. This approach extends the coverage of Pfam by more than 9.5 per cent, exceeding additions made over the last decade, and predicts function for 360 human reference proteome proteins with no previous Pfam annotation.

Source: glamsham.com

GENERAL ATOMICS' GAMBIT AUTONOMOUS COMBAT DRONE TAKES THE INITIATIVE

General Atomics Aeronautical Systems, Inc. (GA-ASI) has unveiled its latest jet-powered robotic drone, the Gambit, which is designed to use artificial intelligence and autonomous systems to fly alongside human-piloted aircraft and achieve air dominance. The company has joined competitors like Boeing and Kratos to produce a full-on combat drone with the lines and performance of a fighter jet. Because Gambit uses AI and can perform a number of tasks autonomously input from an operator, it will be able to take the initiative and carry out tasks on its own, not only for combat, but also for intelligence, surveillance, and reconnaissance, while distributing the collected information to all relevant units.

Source: newatlas

AI PREDICTS ALGAE POTENTIAL AS ALTERNATIVE ENERGY SOURCE

Texas A&M AgriLife Research scientists are using artificial intelligence to set a new world record for producing algae as a reliable, economic source for biofuel that can be used as an alternative fuel source for jet aircraft and other transportation needs. Algae is an alternate feedstock for bioethanol refinery without the need for pretreatment. It's lower cost than coal or natural gas. It also provides for a more efficient way of carbon capture and utilization. Yuan - the researcher scientist's latest project utilizes a patented artificial intelligence advanced learning model to predict algae light penetration, growth and optimal density. The prediction model allows for continual harvest of synthetic algae using hydroponics to maintain the rapid growth at the optimal density to allow best light availability.

Source: sciencedaily

NEW ZEALAND TO SET ETHICAL ARTIFICIAL INTELLIGENCE STRATEGY

New Zealand is developing an approach to supporting the ethical adoption of AI — one that is focused on building an AI ecosystem on a foundation of trust, equity and accessibility right from the onset. Wellington published a draft that should jumpstart its pursuit of an ethical AI ecosystem: the Industry Transformation Plan (ITP) which covers its overall digital transformation road map. Its goal is to support the continued growth of the country's technology sector. More importantly, the government is allowing New Zealanders and those in the private and public sectors to contribute. Now, it awaits feedback from the industry and other parties to refine the action plan.

Source: opengovasia

QUALCOMM EMBEDS ARTIFICIAL INTELLIGENCE INTO LATEST 5G PROCESSOR TO BOOST SPEEDS AND SIGNAL COVERAGE

San Diego's Qualcomm, a leader in 5G, made a flurry of announcements at the Mobile World Congress trade show in Barcelona that could point to where the technology is headed. The news re-emphasised the San Diego company's long-held mantra that 5G is about more than just smartphones. For Qualcomm — San Diego's largest publicly traded company with a market value of US$190bil — the biggest news was the rollout of its fifth generation 5G cellular processor — Snapdragon X70 5G Modem-RF System. Cellular modems manage wireless signals going back and forth between the mobile device and larger cellular network. The Snapdragon X70 is the first chip to embed artificial intelligence to help with this task, with the aim of boosting speeds, coverage and power efficiency.

Source: thestar

ABU DHABI STUDENTS DEVELOP AI-POWERED SOLUTION FOR FOOD SECURITY, REDUCING WASTE

Two students of Mohamed Bin Zayed University of Artificial Intelligence (MBZUAI) have created an algorithm that could revolutionise the UAE's agriculture industry while reducing food waste and enhancing food security. They developed a machine learning framework to detect plant disease by taking pictures using a drone and predicting crop yield through key information fed on a mobile app. The artificial intelligence-powered solution for the agriculture industry consists of two major parts that work together, said the students pursuing masters in machine learning. Early-stage detection of diseases and knowledge of the yield will help the farming community to stabilise the supply and demand of different crops.

Source: khaleejtimes

AN INTERVIEW ON

SOCIAL INNOVATION

AI FOR POSITIVE IMPACT

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TAN YET MEE

Founder and Owner,
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01 ***Your thoughts and views on the disadvantaged groups on employability issues and what can be done to help them.***

Education especially vocational edcuation and training is important so that they have some life skills. Next would be some soft skills training which helps build self-esteem so that they are able to make the right and best life choices for themselves and not continue to fall into the vicious circle of poverty. Basic reading writing and numeracy skills to give financial literacy. This is the same for foreign workers who come to work- there can be an element of knowledge or basic reading writing skills

02 ***The types of schemes that could be considered and formulated by policy makers to help address employment and education issues.***

Government aid to NGOs or bodies that provide outreach for education in more rural areas with basic reading skills- and mathematics. Regulated and streamlined reduced bureaucracy funding from government funding for computer /technology education - exposure of children to such knowledge or using handphones- notwithstanding the availability of computers and the internet. Government schemes can help companies to use AI in training for local marginalized recruits and foreign workers.

03 ***The role of technology like AI to help institutions perform their tasks to manage the disadvantaged groups across the value chain (upstream / downstream).***

AI can use real-time assessment to assess the learning skills of students. AI can also be used to analyze data of current education problems. AI can also be used in manufacturing facilities to assess their aptitude and assign them to the right jobs. This will help to train and better execution. Monitoring of their progress also becomes easier. In terms of the sustainability process, AI can be used to measure their understanding and monitor required sustainabiity practices.

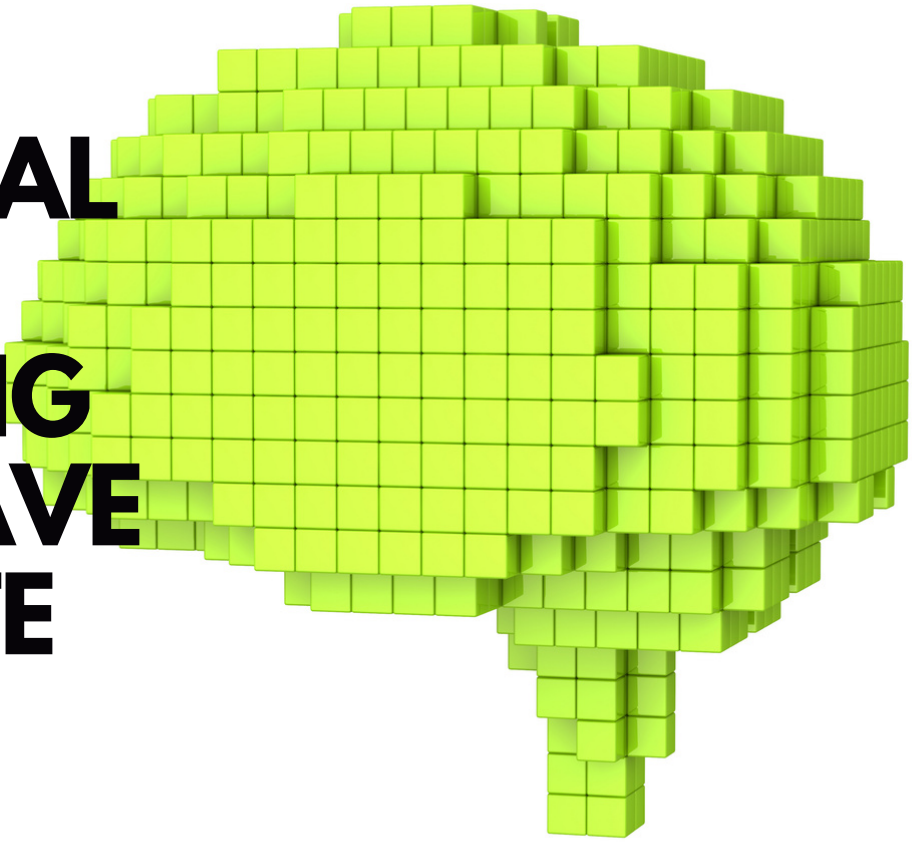
04 ***What do you think will be the key success factors of using AI for this purpose?***

- AI can help reduce costs of education and able to reach out to a wider group, The information and intelligence assessments with AI could be used to gather wide-ranging information and discover new ideas of the needs, and optimized them.
- Cheaper AI facilities for companies to implement.

05 ***What type of human-machine engagement model needs to be done ? How do you maintain the balance between machines and humans for this type of beneficiary evaluation and social impact assessment?***

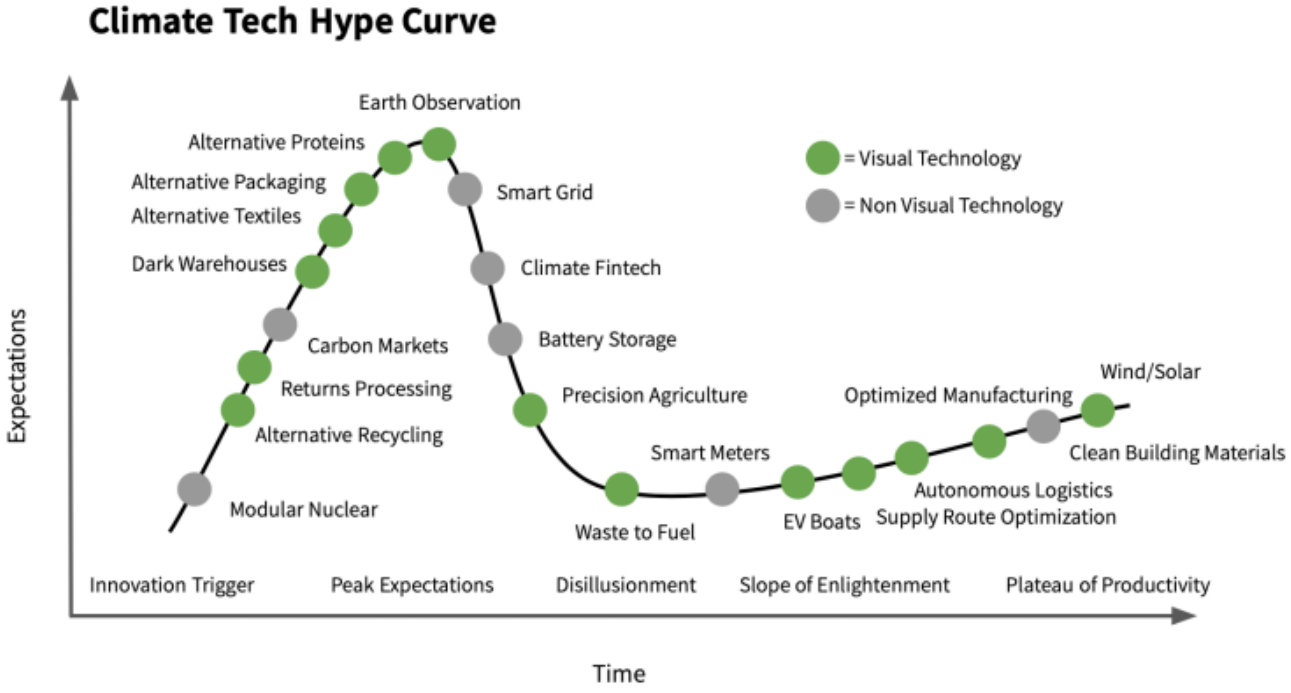
The cultural impact -ie make it small and less intimidating, so that they will try to use it ie a mobile phone type. People are always hesitant when they encounter the unknown. Another is the speed of work, the time spent to learn is for the poor better used to make the end result like farming. Economic assessment - with AI be used to ascertain human needs in terms of their intended work or farming results for instance and the work methodology so that AI becomes the artificial version of the human. this information when shared with recipients will assure them using AI takes them from survival mode to thriving mode. The level of improvement can be monitored real time and evaluations and errors are given real time corrections.

HOW VISUAL DATA IS PROPELLING A NEW WAVE OF CLIMATE TECH



Until recently, there was no visceral sense that the largest challenge we face is fixing the planet. Responding to environmental problems was for too long viewed by big companies as a marketing strategy to target consumers who were more environmentally conscious than others. Today, the tides are, literally, changing, and sustainability is now mission critical for businesses as new wisdom has emerged that illustrates how being 'green' is a catalyst for innovation and market opportunity.

Climate tech companies can now leverage advances in visual data collection, computer vision and AI to bolster their bottom line by focusing on enhancing sustainable practices. Earth observation and analysis now go beyond risk indexing, and can actually measure and mitigate water, fire and land use risk. Molecular imaging and computational design are making fabrics, food and packaging more sustainable, and autonomous robotics is paving the way forward for precision agriculture, supply chains and manufacturing.



REAL-TIME EARTH CLIMATE OBSERVATION AND ANALYTICS

The field of real-time Earth observation and analytics has progressed significantly in the past few years to incorporate remote sensing opportunities that extend beyond traditional space-agency-based platforms and their offerings. According to Euroconsult, a leading global strategy consulting and market intelligence firm specialized in the space sector and satellite enabled verticals, the Earth observation data and service market is projected to reach $7.5 billion by 2030. Sensors have been miniaturized, and energy requirements reduced, resulting in nascent start-up companies today operating more satellites in orbit than any space agency at a minimal cost relative to conventional satellite missions. As climate crises increase in severity, satellite Earth observation technologies combined with historical data can generate risk measurement and mitigation strategies for future catastrophes relating to wildfires, floods and droughts.

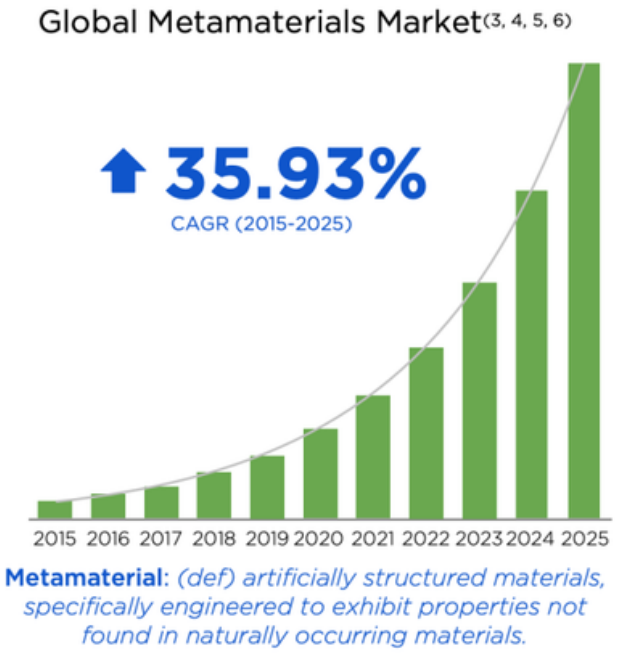
For instance, advances in new space-borne measurements have propagated the development of tracking floods or monitoring precipitation from real-time high-definition video. Small unmanned drones closer to the surface are capable of mapping snow depths or estimating measurements, providing new process insights into hydrological conditions across geographies. In addition, land cover and land use globally can threaten sustainability. Analyzing a global, fine spatial resolution time-series dataset of land cover is advantageous since the location and timing of land use changes on Earth can be identified. This can be applied to stabilizing forest losses or managing the carbon cycle.

Leveraging real-time Earth observation and analytics with artificial intelligence and machine learning can model economic impact and hazard functions of climate events and derive vulnerabilities. Insights into the location, severity and timing of physical and transition risks contribute towards quantifying risk assessment scores so financial institutions and enterprises can develop mitigation strategies in advance.

Moreover, "monitoring ecosystems and natural assets via satellite images and interpreting other information from remote-sensing sources can be critical for companies, NGOs and municipalities to monitor and address a broad range of sustainability concerns like water pollution, water scarcity or access in the context of watershed and water resource management," says Dimple Roy, Director of Water Management for the International Institute for Sustainable Development. "Imagery and remote sensing will be critical to getting in front of major water risks like flood, drought and everything in between." Ultimately, the new techniques afforded by advances in remote sensing platforms presents us with the opportunity to better manage and mitigate risk across severe climate events.

MOLECULAR IMAGING AND COMPUTATIONAL DESIGN

Advances in molecular imaging, advanced light-based technologies and computational design are vastly expanding how and what we can create, making food and materials more cost-efficient and environmentally friendly. Continued progress in spectroscopy and nanophotonics is pushing us towards super-resolution lenses and microscopes capable of providing insight into a wide variety of biological and chemical processes and structures.



These findings will inspire and inform the creation of advanced geometries and materials, like metamaterials, that are enabling higher-performing computers that produce more power, while taking up less space and using less energy. Light and laser direct deposition, photopolymer waveguide, and light-based scanning for ultra-accurate metrology will all be necessary for the consistent additive manufacturing of prototypes that leverage advanced material properties. These prototypes will be faster and cheaper to iterate and could lead to the development of higher-performing parts, such as ultra-efficient turbines that are manufactured more cost-effectively and with lower environmental impact.

Cellular agriculture like lab-grown meats leverages molecular images. New proteins that can coat and extend the freshness of food are being discovered via computational design. More nutritious and less resource-heavy produce is being grown thanks to genotyping and phenotyping of plants and seeds. "Analyzing and visualizing on a molecular level the 3D structures and the movements of proteins enables the redesign of proteins that fit the mass food market as to sustainability, health, taste, stability and cost," says Ilan Samish of Amai Proteins and author of Computational Protein Design.

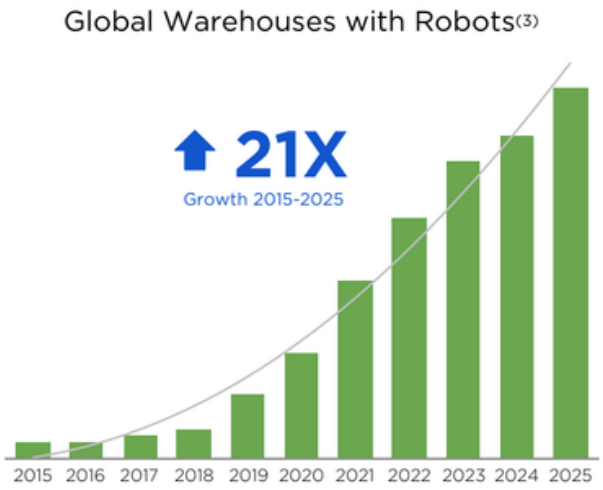
These advancements are not only being championed by food and agriculture but are also generating the beginning of massive opportunities in biodegradable and recycled textiles and packaging that will have a tremendous impact on the ecological impact of the fashion and supply chain.

AUTONOMOUS ROBOTICS ENABLE PRECISION ACROSS MANY SECTORS

Autonomous robots require different varieties of cameras, lidar, radar, and real-time perception to see and navigate through the world around them. The connection between autonomous vehicles that are predominantly electrical, with smaller carbon footprints, is well documented. However, the positive environmental impact of autonomous robotics goes well beyond self-driving cars. Vision-enabled robots will enable a plethora of tasks to be completed more efficiently, precisely and environmentally friendly.

In agriculture, autonomous robotics and equipment-mounted sensors are enabling real-time plant-level management, reducing environmentally harmful inputs like pesticides and fertilizers and improving yield. Cameras and edge computing enable new weeding systems, for example, to make plant-level decisions in real-time, reducing herbicide use by up to 90%. Robotic field aids will augment farm labor shortages that result in significant food waste.

Autonomous robots and drones will collect data on weather conditions, biodiversity changes, and more in outdoor settings to do things like advise better trade routes for maritime vessels and trucks to ensure the least amount of impact on other species. Indoors, they will improve efficiencies in manufacturing processes and limit waste and fuel usage.

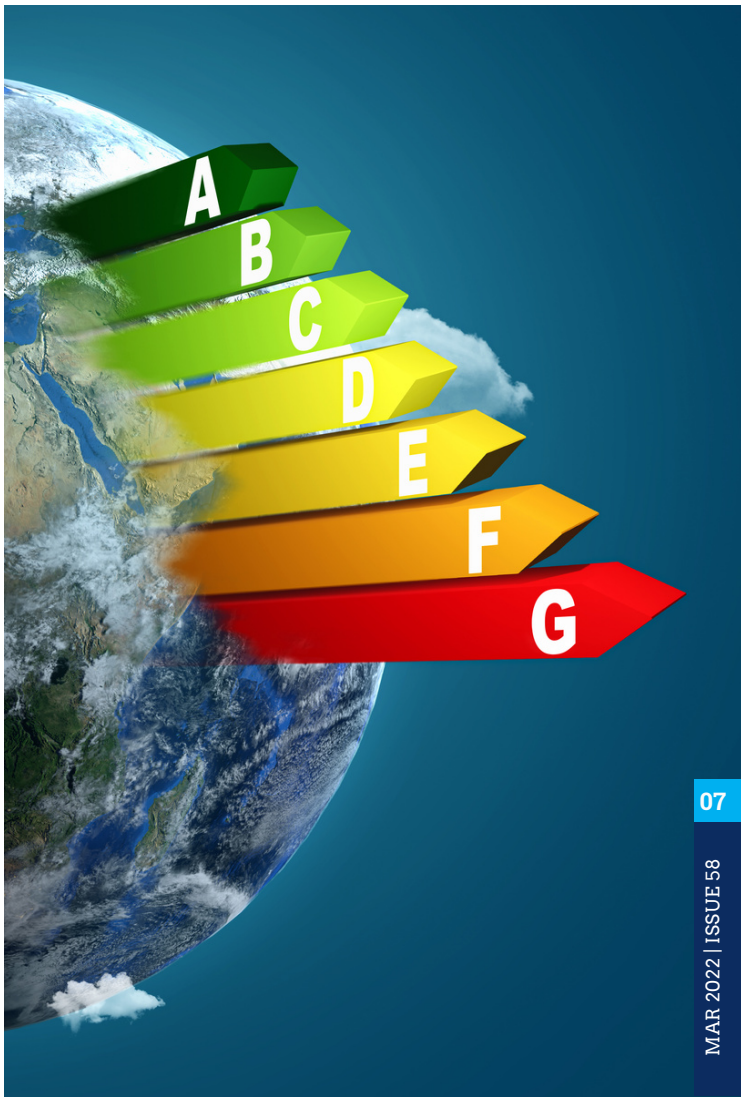


By 2025, 4 million vision-enabled robots will be deployed in 50,000 warehouses to help automate tasks in warehouses and distribution centers. They will enable more goods to be stored in smaller facilities, even some “dark warehouses” that will decrease energy consumption and land use. Additionally, robots armed with cameras, 3mm wave sensors and more will play a central role in solving the mounting challenges posed by returns and reverse logistics, which is a major contributor to global waste and projected to be a $603.9 billion market by 2025.

THE FUTURE OF CLIMATE TECH

The market appetite for climate tech is significantly growing and advances in visual sensing, computer vision and AI are triggering a massive new wave of exciting climate tech companies powered by visual data. More and more companies are incorporating environmental and social governance in their business operations, resulting in improved sustainability scores directly correlated with an improvement in financial and operational performance, as well as a lower cost of capital. With climate change presenting an existential threat to humanity, this generation will behold a new crop of innovation to address mission-critical issues.

Source: Venturebeat



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