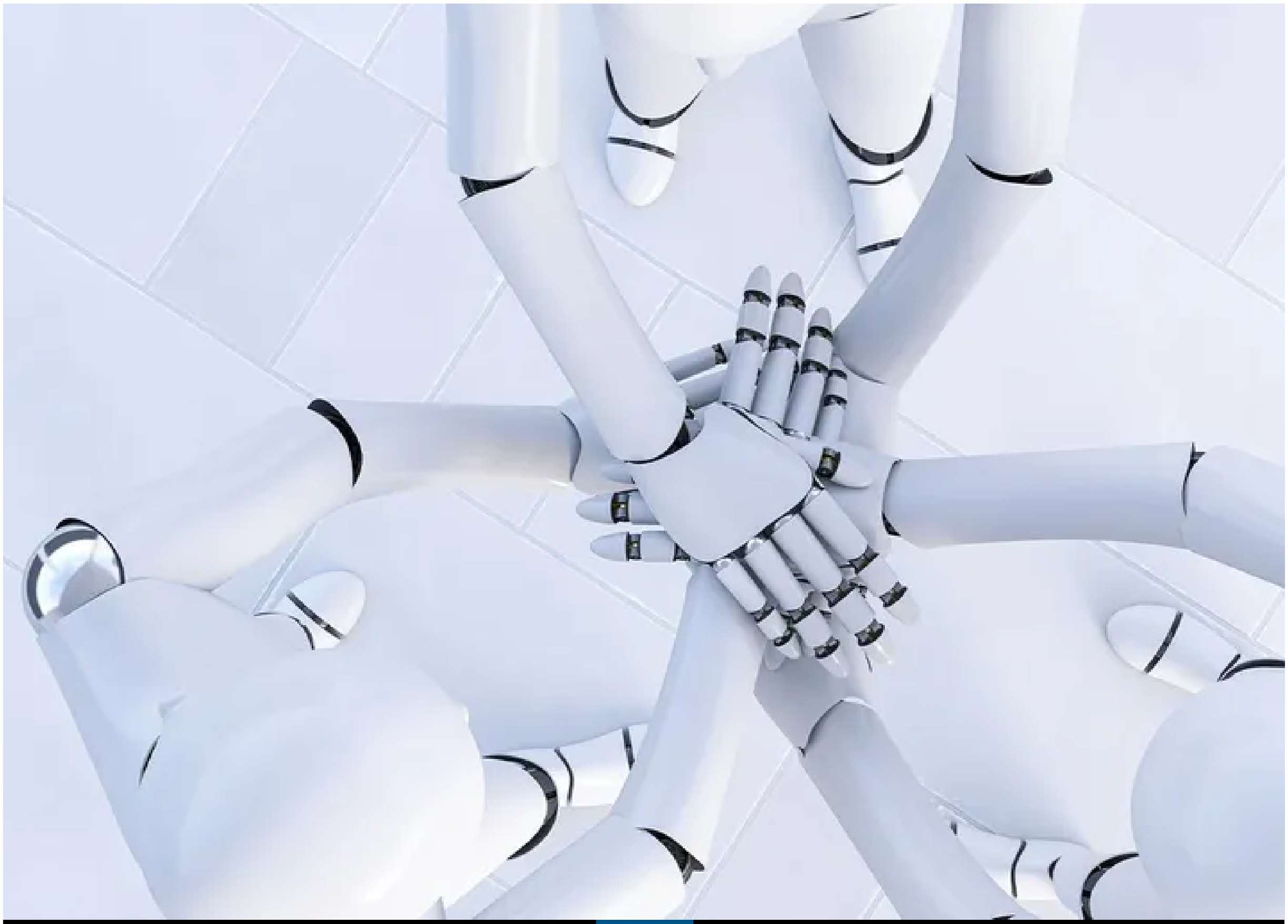


CIO

InsideNow

The Power of Artificial Intelligence (AI)

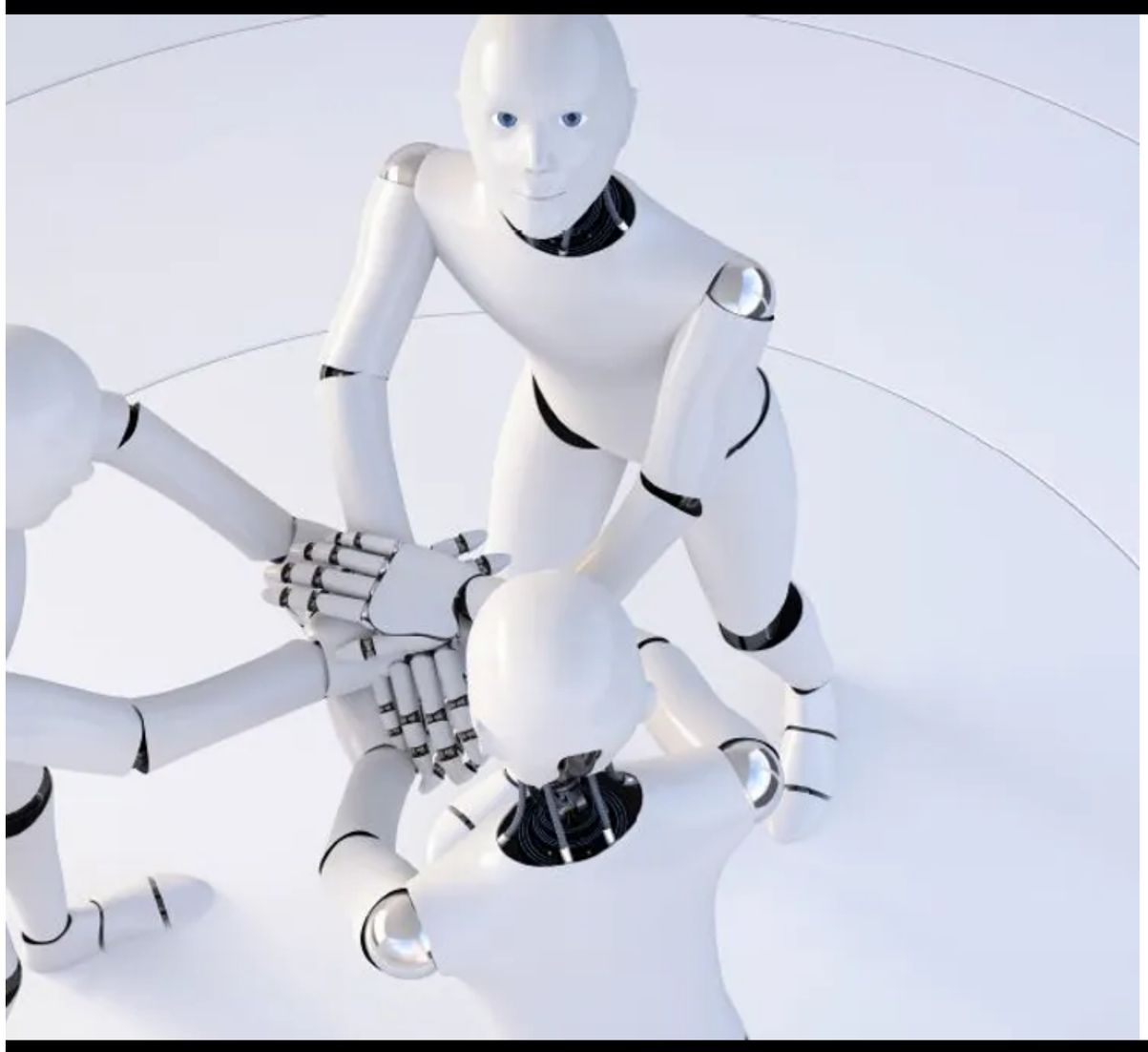
AI *with* sustainability, inclusion and innovation

AI plays a part in tackling today's global challenges in different ways. Apart from its use across different sectors, it supports efforts to make the world more sustainable, creates new inclusion opportunities and drives innovation.

Authors

Patrick Laurent – [Sponsoring] Partner - Advisory & Consulting Group Leader - Deloitte
Jean-Pierre Maissin - Partner - Strategy, Analytics & M&A Leader - Deloitte
Nicolas Griedlich - Director - Analytics & Cognitive - Deloitte
Jordane Le Ponner - Manager - Analytics & Cognitive - Deloitte
Anke Joubert - Senior Consultant - Analytics & Cognitive - Deloitte
Thomas Milazzo - Senior Consultant - Analytics & Cognitive - Deloitte
Mrad Azoury - Analyst - Analytics & Cognitive - Deloitte

Published on 18 June 2020



AI is a field of computing where intelligent machines boost human cognitive capabilities and experiences. AI can replicate certain human-like behavior, such as *recognizing, understanding, interacting and learning*, making it a powerful technology. To fully harness the *power of AI while staying in line with the ethical standards and regulations*, the Deloitte "Age of With"[1] campaign shows how human-centric AI development can complement our daily existence. This is a new era where human collaboration is improved by working *with* machines and technology, while also staying in line with ethical fundamentals. To harness the power of *with*, a broad overview of powerful AI implementation is of interest. This shows how humans can use the untapped potential of machine intelligence to address some of the biggest problems confronting society and build a stronger world.

AI in sustainability, inclusion and innovation

Different AI applications have improved a wide variety of industries and sectors. The health care sector invested more in AI than any other sector, with 2019 investments doubling those of 2018[2]. In 2025, the expected revenue from AI in the automotive sector will be 30 times what they are today[3]. Moreover, in the financial sector, AI-driven algorithmic trading accounts for 75% of all financial market volume[4]. These examples confirm AI's substantial effect on different industries. To further demonstrate the power of AI, we will examine three areas of ethical and civic augmentation for sustainability, inclusion and innovation.

SUSTAINABILITY

AI is integrating every aspect of **sustainability**, aiding in the reduction of waste and resources and preventing deforestation and pollution.

INCLUSION

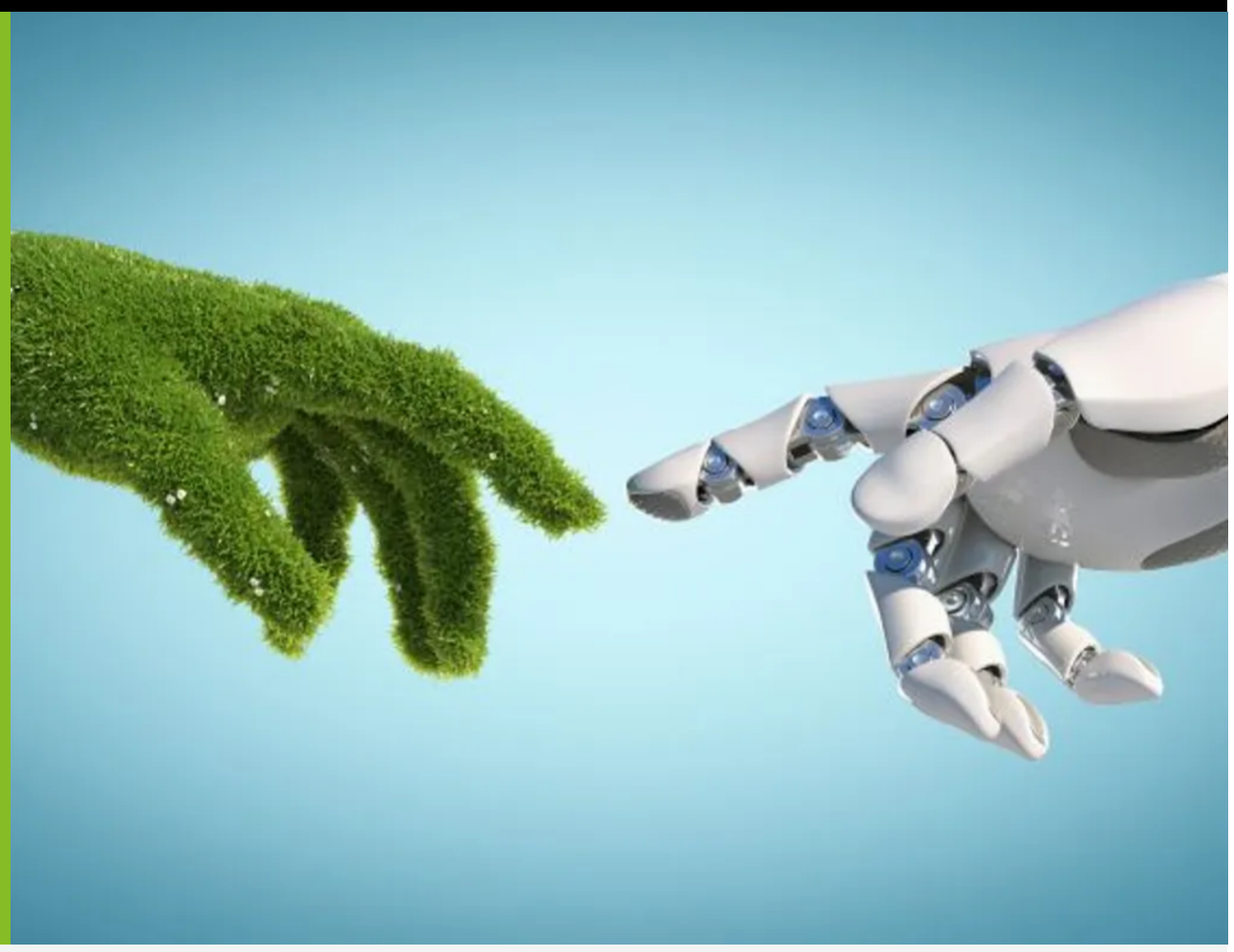
AI is opening doors for **inclusion** by facilitating tasks and activities that were previously unachievable by certain audiences.

INNOVATION

AI is playing a large role in the growth of **innovation** and is assisting the research and development of a whole spectrum of new ideas.

SUSTAINABILITY

The ecological issues that our ecosystem faces are being targeted by AI innovators. Applications that use AI capabilities are being developed across different areas to help keep our planet sustainable.

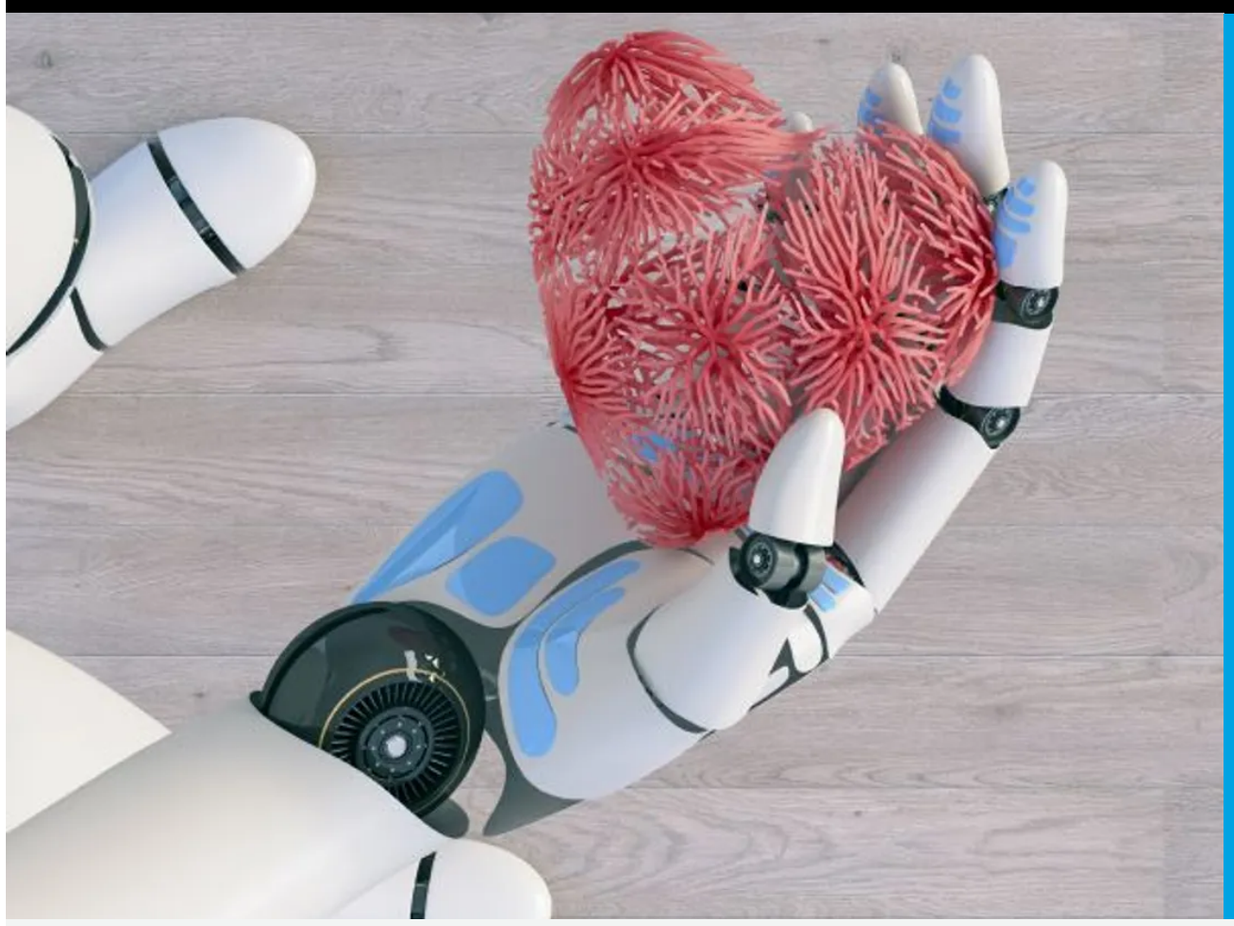


AI can potentially alleviate marine pollution caused by industrial waste and trash dumping. Autonomous floating garbage trucks use AI to optimize garbage-patch detection and collect large amounts of waste. While other applications help prevent harmful activities by predicting, observing and reacting to illegal mass fishing, coastal bleaching and chemical dispatching[5].

AI has also boosted and refined the use of renewable energy. For example, controlling the positioning of solar panels and wind turbines through local weather modeling can maximize energy generation[6]. This, combined with automated energy grids to reduce energy waste, improves the use of renewable energy.

The agricultural sector can also harness AI to enhance its output quality. Applications such as agri-robots, land-use planning, weed detection and identification of appropriate pesticides can lead to a reduction of chemicals used and an improvement in product quality[7]. Machine learning algorithms can recommend the best time and location to plant a specific product by analyzing different data sources such as weather data and images of agricultural fields.

A heightened interest in environmental and sustainable initiatives is evident, alongside increased investment in environmental, social and governance matters and corporate social responsibility. Different businesses have used similar AI techniques not only to reduce costs but also to participate in preserving a sustainable environment.



INCLUSION

AI applications are playing an active role in dampening the negative effect on inclusion by social media and the digital age. By facilitating tasks and activities that were unachievable for certain audiences, AI helps us take a step towards equality in our society. This is in addition to the regulations that foster unbiased algorithm-based actions, which ensure further inclusion in AI-based solutions.

AI is being integrated into smart devices to help ease the burden of many disabilities. Voice-assisted technologies that use text-to-speech and speech-to-text translation introduce comfort and ease of use to our daily tasks; but, more importantly, it also allows people with disabilities to lead more autonomous lives. Cognitive systems and closed-captioning programs use text and image recognition that can assist the deaf and the hard of hearing[8].

By leveraging computer vision and recommendation systems, applications that recognize facial expressions can provide people with autism with instant social tips to help them better adapt to their social surroundings[9]. Moreover, students with literacy problems can benefit from tools that assess their reading abilities and behaviors, so that teachers can adapt their lessons and tests accordingly[10].

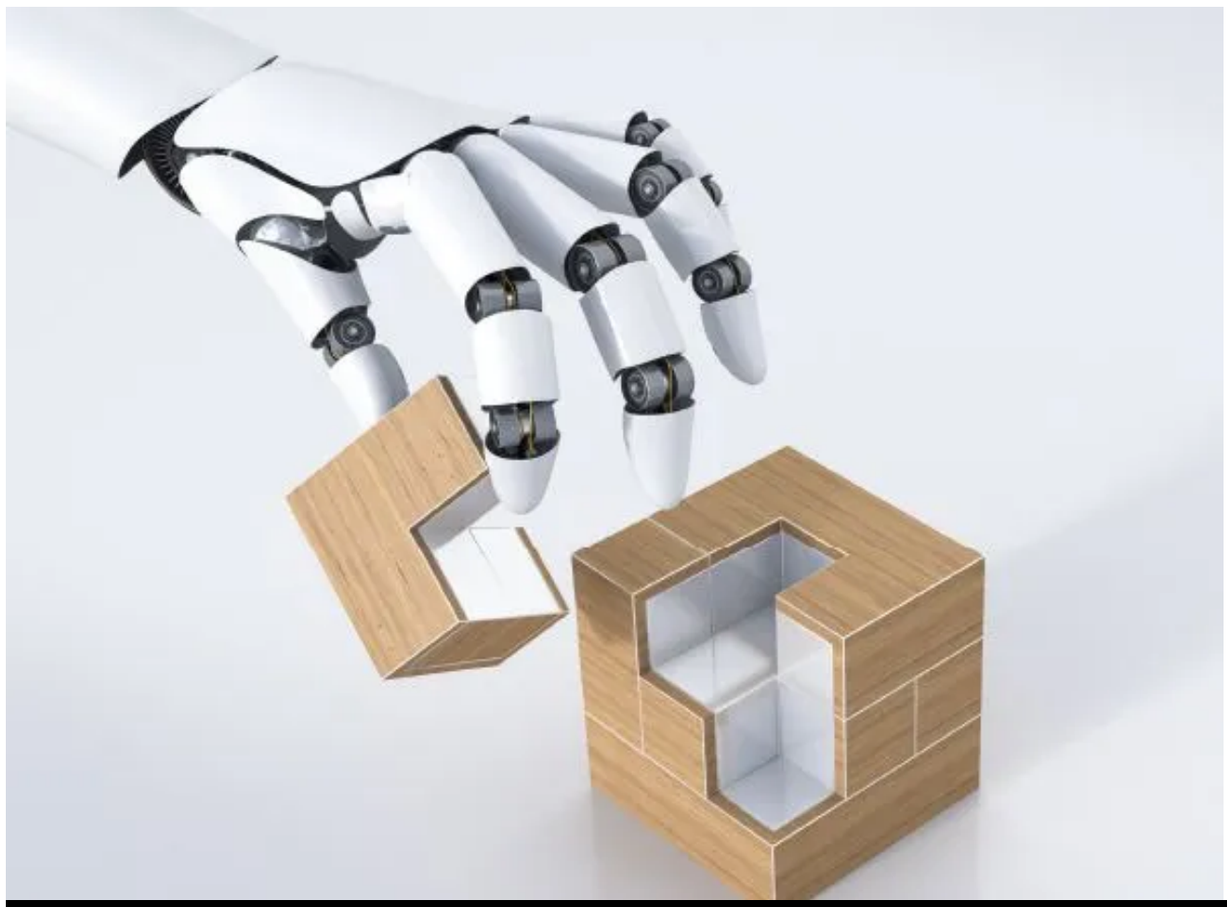
AI also facilitates inclusion in the workplace. Big tech companies are investing millions in the advancement of AI for accessibility[11]. Additionally, web and product developers are redefining their ways of working to place inclusion at the very center of their design, opening their products up to a broader population. Following AI interventions, the number of employed people with disabilities is expected to triple by the end of 2023[12]. The humanitarian role played by AI is undeniable, as it helps close the gap between people with limitations/disabilities and daily life services and offerings.

INNOVATION

AI was the basis of 75% of new patents in 2018 and 80% of emerging technologies are expected to have AI foundations by 2021[14]. This exponential growth is partly due to AI's involvement in the research and development field. Different AI techniques such as NLP and image recognition have accelerated the progress of new discoveries, leading to new AI-driven innovations across various industries.

Using simulation algorithms and hypothesis testing norms, AI solutions can recognize and validate new discoveries[15]. Currently, the use of these techniques is most prominent in the health care sector; reducing the lab-to-patient time of new drug development and increasing the accuracy of predicting and diagnosing new diseases.

AI has uncovered a new horizon of innovative applications that are tailored to many different use cases, leading to the advancement of different sectors. Even though the technology may be the same, its advantage lies in the ability to reproduce a technique that tackles different issues across different industries. Convolutional neural networks allow architects to recreate a physical space in augmented reality to design and present their projects to clients in a more realistic way.



Similarly, this technique helps the film industry age or de-age actors by transforming their facial features. Moreover, Deloitte has also leveraged this technique in its automated car damage recognition tool to speed up car inspections after unfortunate incidents. Every new AI development opens the door for innovative ideas with unlimited application possibilities.

AI innovations are driving a change in the traditional way of doing business and are integrating the different aspects of business applications to enable more data-driven decisions and predictions.

Showcasing the power of AI in urban planning

One specific sector where AI has enabled sustainability, inclusion and innovation is in urban planning. AI-based use cases are supporting city development by studying the effect of macro-economic factors or by enabling better in-city dynamics.

Platforms that incorporate urban information such as economic, social and demographic factors are helping city planners to better allocate hospitals, fire stations and public transportation hubs. One such platform has been used in Europe to help refugee relocation by estimating housing capacities to determine which area is most suitable for its new inhabitants' needs[16]. Innovative AI techniques are being used to boost in-city parking systems; image recognition algorithms analyze sky view maps and geographic information systems to account for the supply and demand of parking spaces.

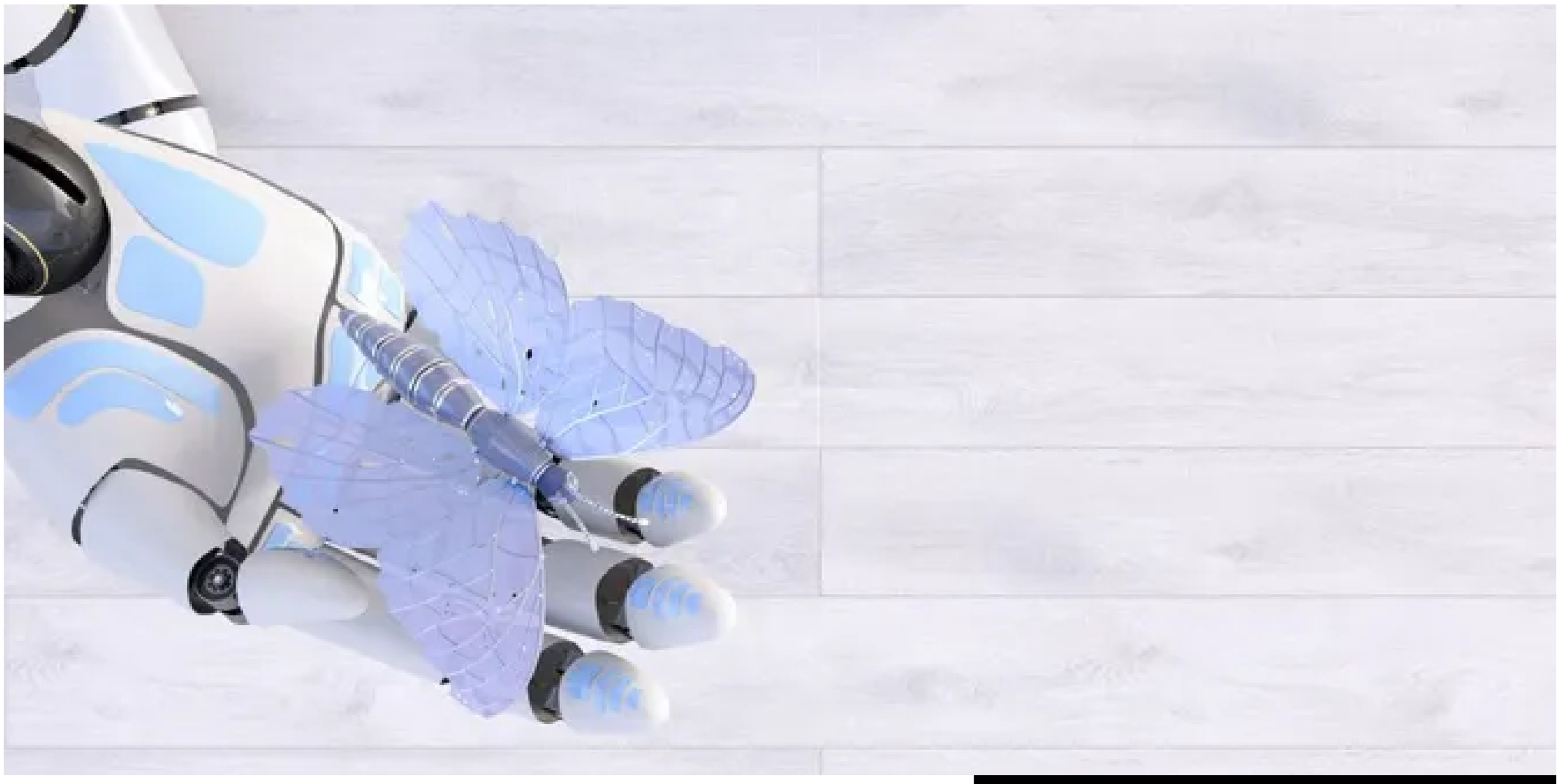
Combining AI with the internet of things (IoT) devices has led to the creation of many smart city applications. Intelligent cameras for traffic lights are replacing push buttons by assessing the correct timing for light switching through image recognition of real-time traffic. To facilitate inclusion, these systems can also recognize people with reduced mobility and allocate additional time to guarantee a safe crossing[17].

Numerous initiatives include the deployment of innovative solutions and the involvement of city authorities. These AI use cases are improving how cities and citizens interact, while leading to optimal use of resources and more efficient service delivery.

The examples of human-centric AI applications that can lead to a better world are limitless. To leverage the power of AI, Deloitte can address various topics through its expertise in various fields combined with its technical AI knowledge. AI is a solution that is available to all businesses, who can start small without the need for a large investment. Scaling up investment should be aligned with the business' strategic goals. Through sustainability, inclusion and innovation, AI can support ethical growth and development.

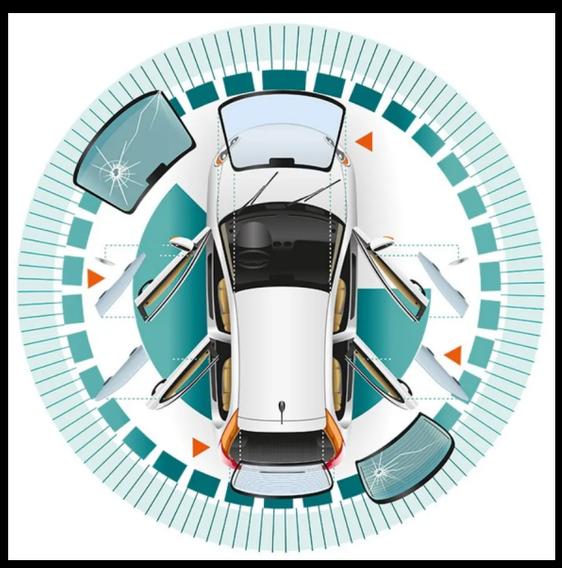
References

[1] Deloitte. n.d. Deloitte. Exploring the future of AI.
[2] Landi, Heather. s.d. *Fiercehealthcare*. Investors poured $4B into healthcare AI startups in 2019
[3] Tractica. n.d. *BusinessWire*. Automotive Artificial Intelligence Revenue Reach 14 Billion
[4] Chauhan, Abhyuday S. n.d. *Becoming Human: Artificial Intelligence Magazine*.
[5] World Economic Forum. n.d. Harnessing the Fourth Industrial Revolution for Oceans
[6] COGNITIVE WORLD. n.d. *Forbes*. How IoT and AI can enable environmental sustainability
[7] Cognitive World. n.d. *Forbes*. How AI is transforming agriculture
[8] Public Broadcasting Service. n.d. *Public Broadcasting Service*. People with disabilities use Ai to improve their lives
[9] Khan, Rizwan Ahmed. n.d. *Research Gate*. Can Autism be Catered with Artificial Intelligence-Assisted Intervention Technology A Literature Review
[10] Enterprise Tech. n.d. *Forbes*. How is AI used in education real world examples of today and a peek into the future
[11] n.d. *Venture Beat*. How microsoft is using AI to improve accessibility
[12] Gartner. n.d. "Gartner." Gartner top strategic predictions for 2020 and beyond
[13] WIPO. n.d. "WIPO."
[14] Gartner. n.d. "Gartner." Gartner top strategic predictions for 2020 and beyond
[15] Enago Academy. n.d. Artificial intelligence research publishing
[16] CityScope. n.d. Cityscope AI technology for enlightened urbanism
[17] Engineering 360. n.d. "Global spec." Smart traffic signals designed for pedestrians with disabilities



Conclusion

- Artificial Intelligence (AI) involves intelligent machines that replicate human cognitive capabilities and experiences.
- Different sectors are using AI applications as their main tool to contribute to the achievement of their strategic goals.
- AI-based applications are ensuring a more sustainable ecosystem by preserving marine life, enhancing renewable energy solutions and optimizing the agricultural sector.
- AI is creating inclusion opportunities to assist people with different limitations, disabilities, learning difficulties or social limitations. These technologies are also creating new opportunities.
- Innovation is driven by AI development, allowing a broad spectrum of innovative solutions that facilitate improvement across sectors.
- AI tools support urban planning to target areas such as sustainability, inclusion and innovation.
- Human-centric AI development is a powerful tool to drive sustainable, inclusive and innovative change.



How our new AI car damage recognition application can make an impact on the automotive industry

Deloitte Luxembourg has launched a trained deep learning model that can accurately recognize car damage.

Read more