From advancing the health sector to optimizing business processes, AI and ML are rapidly changing the face of science, business, and everyday life.

The world is changing fast, and a big driver of that change is artificial intelligence and machine learning.

AI is a technology that is transforming every aspect of life. It is a wide-ranging tool that enables people to rethink how we integrate information, analyze data, and make use of the resulting insights to improve decision making.

Although there is no definition that is generally accepted, AI generally is thought to refer to “machines that respond to stimulation consistent with traditional responses from humans, given the human capacity for contemplation, judgment and intention.”

Characteristics of artificial intelligence

According to researchers Shubhendu and Vijay, artificial intelligence “make decisions which normally require a human level of expertise” and help people anticipate problems or face challenges as they come up. As such, they operate in an intentional, intelligent, and adaptive manner.

Intentionality

Artificial intelligence algorithms are designed to make decisions, often using real-time data. They are unlike passive machines that are capable only of mechanical or predetermined responses. They combine information from several sources, analyze the material instantly, and take corresponding action on the insights derived from those data. With massive improvements in storage systems, processing speeds, and analytic techniques, they are capable of tremendous sophistication in analysis and decision making.

Intelligence

AI generally is undertaken alongside with machine learning and data analytics. Machine learning takes data and search for underlying trends. If it spots something that is relevant for a practical problem, software designers can take that knowledge and use it to analyze certain issues. All that is required are data that are sufficiently vast that algorithms can discern useful patterns.

Adaptability

AI systems have the ability to learn and adapt as they make decisions. In the transportation area, for example, semi-autonomous vehicles have tools that let drivers and vehicles know about upcoming congestion, potholes, highway construction, or other possible traffic impediments. Vehicles can take advantage of the experience of other vehicles on the road, without human involvement, and the entire corpus of their achieved “experience” is immediately and fully transferable to other similarly configured vehicles.

Applications of AI across various industries

AI can be used in all industries. This includes fields such as finance, national security, health care, transportation, and smart cities

ECONOMIC IMPACT

One of the reasons for the advancement of AI is the tremendous opportunities for economic development that it presents. A project undertaken by PriceWaterhouseCoopers estimated that “artificial intelligence technologies could increase global GDP by $15.7 trillion, a full 14%, by 2030.” That includes advances of $7 trillion in China, $3.7 trillion in North America, $1.8 trillion in Northern Europe, $1.2 trillion for Africa and Oceania, $0.9 trillion in the rest of Asia outside of China, $0.7 trillion in Southern Europe, and $0.5 trillion in Latin America.

FINANCE

Investments in financial AI in the United States tripled between 2013 and 2014 to a total of $12.2 billion.9 According to observers, 10 In addition, there are so-called robo-advisers that “create personalized investment portfolios, obviating the need for stockbrokers and financial advisers.”

Fraud detection is another way AI can be utilized in financial systems. It sometimes is difficult to discern fraudulent activities in large organizations, but AI can identify abnormalities, outliers, or deviant cases requiring additional investigation. That helps managers identify problems before they escalate.

Automation and AI are the future of security

Global security teams are losing the data theft wars against cybercrime mafias sponsored by criminal organizations. New research from the Ponemon Institute identifies the causes of IT security gaps and provides insights from 4,000 security pros on how they intend on using AI and automation along with other approaches to restore network infrastructure integrity.

Advancing medicine with AI at the edge

Developing medicines and treatments at speeds seen during the pandemic is a major challenge, as a result of obstacles in security, regulatory, and privacy. One potential solution is swarm learning, whereby AI is used at the edge to decentralize the analysis of data from multiple locations and then share insights through a learning model that satisfies and bypasses regulatory and privacy concerns.

Transportation

Transportation represents an area where AI and machine learning can be of great help. Research by Cameron Kerry and Jack Karsten has found that over $80 billion was invested in autonomous vehicle technology within the space of 3 years. Those investments include applications both for autonomous driving and the core technologies that are essential to that sector.

Autonomous vehicles—cars, trucks, buses, and drone delivery systems—use advanced technological capabilities. Those features include automated vehicle guidance and braking, lane-changing systems, sensors for collision avoidance etc., and the use of high-performance computing and deep learning systems to adapt to new circumstances through comprehensive maps.

Advanced software enables vehicles to learn from the experiences of other vehicles on the road and adjust their guidance systems as weather, driving, or road conditions varies. This means that software is the principal component—not the physical car or truck itself.

Using AI to fight wildfires

As of Dec. 4, 2020, 52,834 wildfires burned 9,539,554 acres, according to the National Interagency Fire Center. To aid in the fight against these devastating fire outbreaks, scientists are using AI to predict how big fires might get and where they might reach.

All of the major ride-sharing companies are exploring driverless cars. The sudden increase in car-sharing and taxi services—such as Uber and Lyft in the United States, Daimler’s Mytaxi and Hailo service in Great Britain demonstrate the opportunities of this transportation option. Uber recently signed an agreement to purchase 24,000 autonomous cars from Volvo for its ride-sharing service.

Start making sense: Building modern data platforms

Enterprises have a data problem: While successful at gathering data, many organizations are still unable to understand the majority of it and apply AI -and ML-powered analytics to solve business problems. Adoption of a truly modern data platform is the answer.

V. Conclusion

The world is on the verge of revolutionizing many sectors through artificial intelligence and data analytics. There are already significant application in finance, national security, health care, criminal justice, transportation, and smart cities that have influenced decision making, business models, risk minimization, and system performance. These developments are generating substantial economic and social benefits.

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