Description

The brigade of scientific breakthroughs and new technologies is relentless and it keeps throwing challenges. Analyzing the astronomical amounts of data being generated through R&D can potentially re-conceptualize the way we perceive life sciences. Artificial Intelligence has stepped in to navigate us through this enormous ocean of data!

Healthcare, life sciences and pharma are no strangers to surfing high on the technological waves. The Human Genome Project was one such wave that hit the world in the 1990s. It drastically changed the way we perceive life. Apart from basic sequence information, underlying mutations, gene interaction patterns multiply the data repository even further. Researchers working on the Human Microbiome Project have identified greater than 100 trillion microbes that we interact with and may have either positive or negative effects on our health.

Artificial intelligence (AI) is the surfboard that is going to keep us afloat in these times. Broadly speaking, it is the science of developing computer programs and technologies that perform complex tasks while simulating human-like levels of intelligence. By setting up sophisticated AI tools, the enormous amount of unstructured data consisting of text, images, and sounds can be comprehended in a faster and more efficient manner.

Let us look at the 'BIG 10' impactful applications of AI in life sciences:

1.
Producing Personalized Medicine

Currently, we are following the 'one size fits all' theory in terms of medicine dosing. Relatively, little information about the patient is considered when a therapy designed or the dosage is set. AI platforms, the game changers, have the potential to access the digitized patient health records and suggest the best treatment plan. Furthermore, by continuously monitoring several parameters, AI may enable medical practitioners to adjust the dose size or, if the disease mutates, revise the therapy and introduce a more effective alternative. Enlitic specializes in developing deep learning medical tools that analyze unstructured records (medical history, images, blood tests, EKGs, genome reports) thereby, helping the doctors cater to the patient's real-time needs.

2.

Drug Discovery and Manufacture

Drug development involves a tedious, time-consuming, and expensive approach that consists of screening a large number of potential molecules. Artificial Intelligence-based programs are able to scan and cross-reference through large and complex datasets more quickly and precisely as compared to human efforts. This results in a more accurate list of potential drug candidates in a shorter span of time.

3.

Bringing Therapies and Drugs to the Market

It takes more than a decade and billions of dollars to introduce a new drug to the market. AI helps in putting all the data, obtained from myriad sources (hospitals and research labs) in a compatible format. Besides this, AI also helps in developing better healthcare networks and protocols, speeding up their introduction in the market at a reasonable price.

4.

Designing Clinical Trials using Artificial Intelligence

Artificial Intelligence plays a progressively important role in designing clinical trials, estimating the ideal sample size, and implementing them remotely on participants across a wider geographical area. This, in turn, reduces the cost and increases the odds of obtaining relevant and accurate data.

5.

Diagnosing of Diseases

Incomplete medical records and a large number of cases can lead to erroneous predictions and disease diagnosis. Buoy Health is an AI-based chatbot that listens to the patient's health issues and associated symptoms, and then using algorithms guides the patient to the correct therapy. AI platforms that scan through medical images, such as those generated during radiotherapy and mammography, and identify the disease have already been established.

6.

Introducing Robotic Surgery

Robotic surgery is a new field that is garnering a considerable amount of interest, Nowadays, surgeries can be performed in previously inaccessible places using the da Vinci robot. Once trained, a robot will be competent enough to perform each operation consistently and accurately. The consistency and accuracy of the surgery will be irrespective of the duration of the surgery. It is touted to be superior as compared to human performance which will predictably decline with time.

7.
Supply Chain Management and Logistics

Drug manufacturers and pharmaceutical companies can also transform their businesses through AI. For instance, AI makes it easier to forecast demands and subsequently scaling the production on a need basis.

8.
Applications in Scientific Publishing

Artificial Intelligence technologies are significantly revolutionizing publishing protocols. It helps to address key issues such as identifying new peer reviewers, combating plagiarism, and identifying data fabrication. This will not only aid in accelerating scientific communication and reducing human bias but also uphold the publishing quality.

9.
Developing the Next-generation of Radiology Tools

The current diagnostics processes rely on either invasive techniques or gaining insights from radiological images. These include data from CT scans, X-rays, or MRI machines. AI-based radiology tools will enable the clinicians to develop a more precise and detailed understanding of how a disease progresses by performing virtual biopsies.

10.
Expanding Healthcare Access in Developing Regions

Unavailability or dearth of trained professionals such as radiologists or ultrasound technicians can considerably limit access to life-saving care. This is commonly observed in emergent and developing parts of the world. The AI-powered tool – 'Telemedicine', that equips patients to tackle and prevent certain health concerns has become popular in such regions. The health care start-up 'WeDoctor', can independently conduct eleven diagnostic tests and upload data for consultation in an automated fashion.

Challenges In Application Of Artificial Intelligence

Evidently, a large amount of data is untapped because of its heterogeneity and unstructured format. Although AI seems to be a promising approach that will advance life science, certain challenges remain.

A recent survey by Pistoia Alliance showed that lack of skills (44%) and access to data (52%) are the major hurdles to the implementation of AI.

Many stakeholders are yet unaware of the richness of the collated data. Subsequently, there is an urgent need to educate. There is a need for highly skilled and trained, specialist data experts to meet this challenge.

Further, the fundamental prerequisite for obtaining good quality data is feeding hygienic data to the AI platforms. Only the data that is consistent, clean, and complies with the FAIR principles yields reliable results.

For Artificial Intelligence to realize its full potential, it is important to design a concrete framework and start involving ethics to ensure data privacy and fairness. Also, it should begin right at the conceptualizing phase of algorithms that drive Artificial intelligence.

Category

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