

Artificial Intelligence And Its Services to Humanity

**Prepared for:
Dr. Jaber Salami**

**Prepared by:
Group 4**

**Submission date
November 11, 2022**



University of Jeddah

Asfan road

Jeddah

Dr. Jaber Salami

University of Jeddah

Asfan road

Jeddah

artificial intelligence and its services to humanity

We have completed our report on the applications of artificial intelligence in different fields that serve humanity as this project authorized on October 11, 2022.

This report mentions the definition of artificial intelligence and its applications in the fields of medication, industry and commerce, education, and environment. We illustrate how artificial intelligence can enhance efficiency in these fields by showing different examples and pictures in sections of the report.

Thank you for accompanying us for oversighting and directing our team for the long journey of authoring this report, in the hope of delivering an astonishing work that meets your pleasure.

Sincerely.

Group 4

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Abstract

Today, everyone is talking about artificial intelligence, and businesses and governments are concentrating on how to integrate it in their programs and services. The creation of intelligent machines that can do activities that typically require human intelligence is the focus of the broad field of artificial intelligence in computer science. We can infer from this statement that a variety of fields can use artificial intelligence to their advantage.

For instance, AI is used in the medical industry to manage patients. In addition, they are keeping an eye on patients' conditions from the comfort of their own home to avoid negative outcomes. After AI, drug development is quicker and simpler, and it will benefit more people in less time.

Teachers and students in the educational industry can employ AI to save time and treat each student appropriately. As well as robots are helpful in the domains of industry and commerce by handling and picking, cutting plasms, and managing liquids. Additionally, AI is used by air and land transportation to regulate movement and lower accident rates. Besides, AI is used in the environmental sector to enhance farming and weather forecasting.

Introduction

Artificial intelligence is the most thing that everyone talks about today, and all governments and companies focus on how to use it in their services and applications. Artificial intelligence is a broad area of computer science that focuses on creating intelligent machines that can carry out tasks that traditionally need human intellect. From this definition we can assumed that there is a lot of fields that can Employed the artificial intelligence in their favor.

Report description

Artificial intelligence has helped reduce problems that may occur in many areas. In addition, it helps make life easier by adding tools that perform challenging work instead of a human. So, we have discussed how artificial intelligence is helping humanity in many areas by solving their problems

Scope and limitation of report

The purpose of this report was to explain how artificial intelligence helps in solving problems in many fields. Five fields we had studied, we extracted from these fields many uses of artificial intelligence which brought about a drastic change in their progress., it is as follows:

- Medicine
- Education
- Industry and Commerce
- Transportation
- Environment

We have gathered some information in the report from several sources, which include articles, reports, and books. Also, we asked some of the specialists working in the same field about some problems that have been solved thanks to artificial intelligence.

Report format

This report includes:

1. Main points: Five fields play as main points of report.
2. Supporting points: Some uses for each field that support the main point.
3. Conclusion and recommendation.

Medical field

The goal of artificial intelligence in healthcare is to provide numerous significant benefits in the healthcare field. The primary goal of health-related AI applications is to establish links between clinical techniques and patient outcomes. AI is being used to improve tools that aid pathologists, radiologists, dermatologists, ophthalmologists, and other physicians who perform visual diagnoses. AI in healthcare is improving people's lives. AI is used to make faster and better decisions and to apply problem-solving techniques that humans cannot. The most important outcomes of using AI in healthcare are lower rates of medical errors and lower medical costs. Doctors can use AI to perform more complex surgeries in less time, with the lowest error rate and highest performance [1].

Medication Management

The National Institutes of Health developed the Ai Cure app to track a patient's medication use. The webcam on a smartphone combined with AI to automatically confirm that patients are taking their prescriptions and assist them in managing their condition. People with serious medical conditions, patients who defy doctor advice, and clinical trial participants may be the most common users [2].

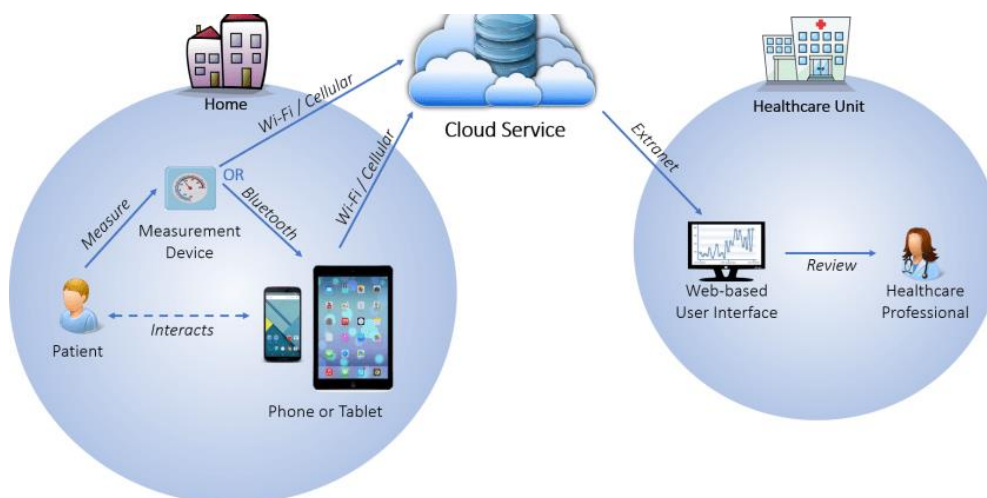
Treatment Design

Artificial intelligence systems have been developing to analyze data, notes and reports from a patient's file, external research, and clinical expertise to assist in selecting the best individually tailored treatment path [2].

Health Monitoring

Fitbit, Apple, Garmin, and other wearable health trackers monitor heart rate and activity levels. They can send alerts to users to get more exercise and share this information with doctors (and AI systems) for additional data points on patients' needs and habits [2].

Figure 1: remote patient monitoring system [3]



Drug Creation

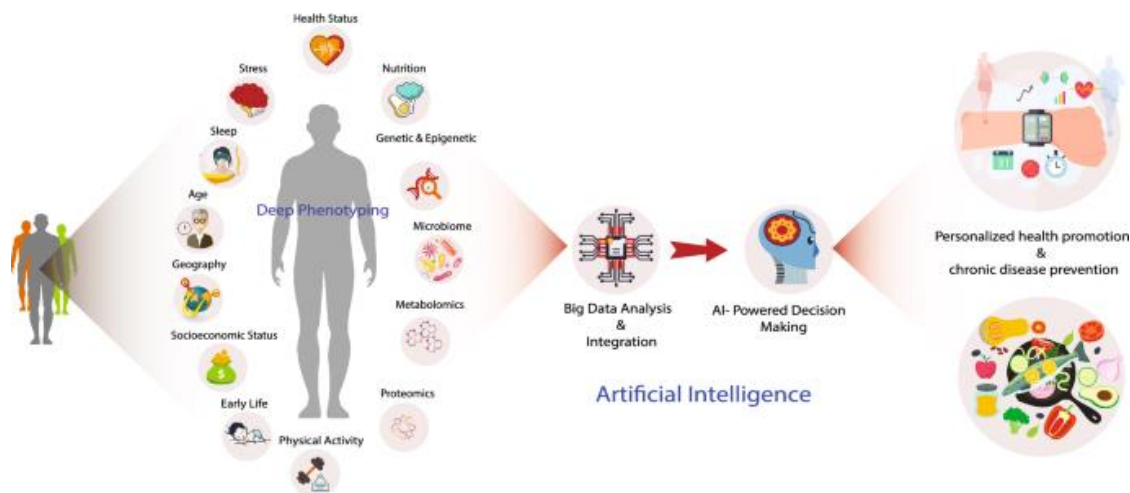
Clinical trial drug development can take more than ten years and cost billions of dollars. The world could alter if this process were made quicker and more affordable. During the recent Ebola virus panic, an artificial intelligence algorithm was employed to search for existing medications that may be modified to treat the illness.

When investigation of this kind typically takes months or years, the algorithm discovered two drugs that may reduce Ebola infectivity in one day, a discovery that potentially result in the saving of thousands of lives [4].

Precision Medicine

Genetics and genomics examine DNA information for mutations and links to disease. Body scans using AI can detect cancer and vascular diseases early and predict health issues people may face based on their genetics [2].

Figure 2: Deep phenotyping and artificial intelligence for health promotion and chronic disease prevention [5]



Virtual Nurses

The start-up Sense.ly has developed Molly, a digital nurse to help people monitor patient's condition and follow up with treatments, between doctor visits. The program uses machine learning to support patients, specializing in chronic illnesses. Also in 2016, Boston Children's Hospital developed an app for Amazon Alexa that gives basic health information and advice for parents of ill children. The app answers asked questions about medications and whether symptoms require a doctor visit [2].

Educational field

Every aspect of education has changed because of technological advancements, including how we teach, the methodology we employ, and how we run our classrooms. Educational technology has advanced to a level never previously seen. Today's students and teachers benefit from the use of artificial intelligence in their learning and teaching processes. Artificial intelligence's contribution to the process of education and training will grow and be improved as technology advances.

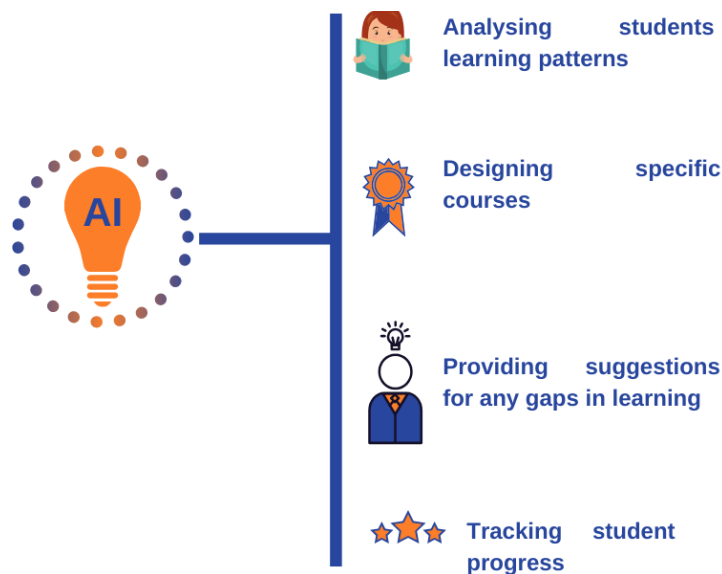
Time saving

The job of a teacher does not end in the classroom. Tests were created by teachers, who also grade homework assignments and exams. A teacher can save time by deploying an AI helper for administrative work. Then, that time can be used to enhance lesson ideas and give instruction to students [6].

personalize learning

Everyone is unique. People can learn in the most effective way for them thanks to AI technology. This can consequently increase learning rates and success rates. Additionally, it can give teachers useful information about student performance. Teachers will be able to identify when students are suffering thanks to this information. They will then be able to act quickly to stop students from falling behind [7].

Figure 3: AI in personalized learning



Industry and commerce field

Robots are the first thing that comes to mind when we discuss artificial intelligence in the workplace, especially the work that robots do in factories. It has many shapes and types depending on the function it performs [8] (see appendix A for more about robots).

Handling & Picking

Handling and picking robots include those that move objects about a warehouse or take items out of a tote and put them in a shipping container. Robots that can pick and fill orders are in high demand due to the growth of e-commerce.

The popularity of stand-alone forklifts has increased, and one of its advantages is that the labor costs of transporting goods are reduced, but there is also the issue of safety. There are thousands of injuries and hundreds of deaths globally each year using forklifts and other material handling equipment. To solve this problem, a set of scanning and laser sensing devices has been placed in the self-driving forklifts to avoid accidents.

Any robot that can comprehend and navigate its environment without direct human supervision is considered an autonomous mobile robot (AMR). Typically, this is achieved through an array of sophisticated on-board sensors, computers, and maps, which allow AMRs to understand and interpret their environment. Smaller carts are also included in the category of autonomous mobile robotics (AMRs), which also includes larger autonomous vehicles like forklifts. In a warehouse, an AMR is frequently used to move items from an order picker to a packing station. AMRs are incredibly adaptable because, after creating a map of the facility, they can move between locations while autonomously dodging hazards [9].

Figure 4: Models for AMRs [9]



Liquid Handling

Intelligent Liquid Handling Robots are employed in biological laboratories to carry out a variety of liquid handling operations that would otherwise be completed by humans. Pipetting, sample preparation, and microplate washing are frequently carried out using liquid handling robots. Applications that call for frequent, repetitive pipetting include testing medical samples, examining the chemical make-up of liquids, and conducting biological experiments. A little amount of liquid drawn into a syringe and precisely measured amounts then transferred to another container through the process of pipetting [10].

Sample collection can take several hours a day for laboratory and medical technicians. It is a manual, iterative procedure, so errors are common. Using robots with these fluids is one way to address this issue, which increases throughput, improves accuracy, and enhances traceability. Because manufacturing eye drops, nasal sprays, and a wide range of other liquid medicines requires pharmaceutical companies to precisely pour fluid into containers [10].

Plasma Cutting Robots

Beginning in the 1960s, plasma cutting developed from plasma welding. It was a reliable method for cutting steel plates and sheet metal by the 1980s. Compared to more conventional, abrasive "metal on metal" techniques, plasma cutting has advantages. It produces smoother edges and more accurate cuts without producing metal chips. Six degrees of freedom of movement are possible with robotic plasma cutting systems, allowing for exceptionally flexible operations and the potential for intricate cuts [11].

Transportation field

Artificial intelligence is causing changes in the transportation sector. It is already utilized in many sectors of the transportation industry, from improving traffic flow to assisting with vehicle autonomy on trains, ships, and airplanes. In addition to making our lives easier, it can help make all modes of transportation safer, cleaner, smarter, and more efficient. Artificial intelligence-powered autonomous vehicles, for example, could assist in reducing the human errors that cause so many traffic accidents. The unforeseen repercussions and misuse, like cyberattacks and biased transportation decisions, come along with these opportunities, though. Additionally, there are implications for employment and moral concerns surrounding responsibility for judgments made by artificial intelligence instead of humans [12].

Road Transport

One of the industries where AI has been most successfully deploying is the Road transportation industry, enabling whole new degrees of cooperation between various road users. Globally, automakers, tech companies, and research organizations are investigating AI technologies to create driverless vehicles for use in both commercial and personal transportation. These vehicles rely on a range of sensors (including GPS, cameras, and radar), as well as actuators (devices that convert an input signal into motion), control systems, and software. Others of these technologies aim to totally replace the human driver, while others just automate specific driving tasks (like parking) [13].

Figure 5: Use of artificial intelligence in cars



Aviation

The application of AI to air traffic operations is still quite young. The management of rising air traffic volumes is being improved because of advancements in automation and processing capacity, which make use of machine learning and data analytics models. According to the IATA research, new opportunities for enhancing current traffic management systems, separation standards, and airspace planning design will arise because of the development of unmanned aircraft systems (UAS) and UAS traffic management systems leveraging greater computer capabilities. Ground handling is another area where AI can have an impact on both speed and processes. Some examples of high potential use cases include safety checks, aircraft movement operations (pushback and towing), aircraft turnaround operations (fueling, catering, loading, and unloading, de-icing and anti-icing), and ground transportation on the ramp (passengers, baggage, cargo, and mail) [13].

Environmental field

Artificial Intelligence applications in environment includes Food and farming, climate change and climate analysis. Application of artificial intelligence can increase efficiency of agricultural systems and different services to food sector providing increase of overall productivity in both fields. As Climate Change is drawing near, Artificial Intelligence used to enhance deeper analysis of climate data thus predicting expected dangers in the future and developing realistic images for flooding caused by Climate Change used to raise awareness to people.

Figure 6: AI Generated Image.



Farming

Artificial Intelligence provides better agricultural systems resilient to the modern challenges and demands faced in field of agriculture, which are: general crop management, diseases and infestation, product monitoring and storage control.

The crop management system provided by Artificial Intelligence (AI) covers each aspect of farming, examples are corn crop protection system, management of apple plantation system, A multi-layered artificial neural network-based system that protect citrus crops from frost damage.

Insect pest infestation and disease control is of the most necessity for farmers, computerized systems aided by Artificial Intelligence (AI) help develop faster diagnosis and control measures, mitigating losses and dangers to a greater extent.

A main pillar of agriculture is product monitoring and storage control, several systems and mechanisms based on Artificial Intelligence (AI) used in the context.

Agricultural enterprises are prime for use for Artificial Intelligence (AI) systems as they hold many potentials for solving problems faced in every step of farming from the seeds till consumption [12].

Food

Food is a necessity for humans as world population grows, the need for applying Artificial Intelligence (AI) in food sector increases, some of these applications are food vending machines, AI customer feedback system, food safety, food waste management systems. Thus, enabling more sustainable and healthful productivity for customers and staff [12].

Climate change public awareness

As artificial Intelligence has the ability to create realistic images using generative adversarial networks (GANs), it helps to better communicate the effects of climate change as in increase of flooding using images generated by AI to ordinary people [13].

climate change and weather extremes

As data gets large traditional analysis techniques are unsuitable to be used, with potential of Artificial Intelligence can extract relationships from large datasets it can lead to better characterization of climate resulting in better analysis of Earth System data, finding linkages in the datasets thus providing warnings and advice to society of approaching weather extremes [14].

Conclusion

In summary, today, artificial intelligence plays a fundamental role in our life, because it performs many actions that are extremely hard for humans and make our life easier. So, all governments and firms focus on how to develop these fields in their favor.

A lot of areas use artificial intelligence. In the medical field for example, they use AI to manage their patients. As well as they are monitoring the state of patients from their home to prevent bad scenarios from happening. Innovating drugs after entering AI is faster and easier, and it will serve more people in less time.

In the educational field, teachers and students can use AI to save time and make an appropriate approach to every student. Robots have a good help in industry and commerce fields by handling and picking, plasms cutting and liquid handling. In addition, road and aviation transports use AI to control the movement and reduce the accident. The last field we discussed was environmental field, which uses AI to improve farming and prediction of weather.

Recommendation

After we have worked on this report, we suggest some recommendations that may be useful in employing artificial intelligence for the benefit of humanity, which are the following:

1. Intensifying the curricula in general and university studies, which leads to an increase in students' awareness of the concept of artificial intelligence and its applications.
2. Building Commissions and organizations concerned with the field of artificial intelligence, so that they stimulate and adopt projects related to artificial intelligence
3. Establishing educational courses within companies to clarify the uses of artificial intelligence within them, and to develop the skills necessary to deal with them

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Appendix A

What is robotics?

A major area of computer science and engineering is robotics. Robotics entails the creation, maintenance, use, and operation of robots. Robotics aims to create devices that can aid and support people. Mechanical engineering, electrical engineering, information engineering, mechatronics, computer engineering, software engineering, and mathematics are all integrated into robotics. Robots have long been a mystery in popular culture. It often appears as though these anthropomorphic, exaggerated robot representations are parodies of the genuine thing.

A robot is a programmed machine that can carry out a task, and robotics is the field of study devoted to developing robots and automation. The level of autonomy varies among different robots. These levels vary from fully autonomous robots that run on their own to robots that work under human supervision. Robots are frequently utilized in mass production of consumer and industrial items, assembly and packaging of those commodities, transportation, earth and space exploration, surgery, armament, and laboratory research.