

THE ROLE OF ARTIFICIAL INTELLIGENCE IN THE EXPANSION OF THE INTERNET OF BODIES (IOB)

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Abstract

The Internet of Bodies represents a new frontier of technology that has the potential to revolutionize a multitude of fields. By using sensors and monitoring devices to collect information, the use of IoB can contribute to increasing the efficiency and quality of health care services, it can bring benefits in the field of business management, or in areas such as sports and wellness, as well as in terms of personal safety. The article presents the technologies that are used in IoB, the contribution of IoB to increasing the efficiency and quality of services, and also the risks and ethical issues of using the Internet of Bodies.

Keywords: *Artificial Intelligence (AI), Internet of Bodies (IoB), Internet of Things (IoT), JEL Classification: JEL: M59.*

1. INTRODUCTION

Artificial Intelligence (AI) plays a significant and continuously growing role in modern society, with a wide range of applications and impacts in various fields. However, there are also challenges related to ethics, security, and the social impact of AI. Its development and use require ongoing attention in order to ensure significant benefits and to minimize potential risks.

Artificial Intelligence (AI) represents a revolutionary field of computer science that seeks to replicate human-like intelligence and reasoning in machines. AI systems are designed to perform tasks that typically require human intelligence, such as problem-solving, learning, language understanding, and decision-making. Over the years, AI has made significant advancements, enabling computers to process vast amounts of data, recognize patterns, and make predictions (Icke, 2022).

AI encompasses various subfields, including machine learning, natural language processing, computer vision, and robotics, each contributing to different aspects of AI's capabilities. These

advancements have had a profound impact on various industries, including healthcare, finance, transportation, and more, by automating tasks, improving efficiency, and providing valuable insights.

In this age of AI, understanding its fundamental principles, capabilities, and potential challenges is essential. This introduction aims to provide a glimpse into the world of AI and its far-reaching implications for our rapidly changing society (Chorost, 2011).

2. KEY CONCEPTS RELATED TO ARTIFICIAL INTELLIGENCE

- **Machine Learning:** An important subdomain of AI in which computer systems learn to perform tasks without being explicitly programmed. They use data to identify patterns, make predictions, or perform classifications.
- **Knowledge Representation:** AI often involves creating models and knowledge structures to solve complex problems. These structures can take the form of graphs, neural networks, or other forms of information organization.
- **Computer Vision:** A branch of AI that focuses on developing systems that can see and understand the visual world, interpreting images and videos, identifying objects, recognizing human faces, and more.
- **Natural Language Processing (NLP):** NLP refers to the ability of AI systems to understand and communicate in human language. This field is used to develop virtual assistants, automatic translations, text summarization, and more.

- Solving Complex Problems: AI is used to solve complex problems in various fields, from medicine and data science to transportation and finance. It can assist in decision-making, optimize operations, and identify patterns in massive data.
- Robotics: AI is a key component in the development of intelligent robots. These robots can be programmed to interact with their environment and humans, perform various tasks, and learn from experience.
- Ethics and Security: An important concern in AI development is ethics. Questions arise about how these technologies should be used responsibly and in accordance with human rights and values. The security of AI systems is also emphasized to prevent their exploitation or abuse.
- Deep Learning: A subfield of machine learning that focuses on using deep artificial neural networks to solve complex problems, such as speech recognition and image processing.
- Self-Learning and Continuous Learning: A key aspect of AI is the ability to learn continuously and adapt to changes in its environment. AI systems can improve their performance as they receive more data and feedback.
- Practical Applications: AI is used in various fields, including virtual assistance, autonomous vehicles, the medical industry, financial analysis, marketing, video games, and more.
- Eleonore Pauwels, the director of the Anticipatory Intelligence (AI) Laboratory, stated that humans created AI and they now need to learn how to live with it in the upcoming "algorithmic era." (Klubnikin, 2022)

3. THE ROLE AND VISION OF IOT

To better understand what IoB (Internet of Bodies) means, we need to consider how the Internet of Things (IoT) operates – all these smart devices that are not only connected to each other but also to a broader network, where AI can analyse and optimize all this data.

The Internet of Things (IoT) has an immense potential to change the way human interactions with the physical world and the environment take

place. However, there are challenges, including those related to security, privacy, and scalability, that require continuous attention to maximize the benefits and minimize potential risks.

"Smart" devices connected to the internet are increasingly available on the market, promising consumers and businesses greater convenience and efficiency. Within this broader Internet of Things (IoT) there is a growing industry of devices that monitor the human body and transmit the collected data via the internet (Greenberg et al., 2020).

4. BEYOND IOT: INTERNET OF BODIES, OR IOB

This evolution, which some people called the "Internet of Bodies" (IoB), may be regarded as an extension of the Internet of Things (IoT). It refers to the integration of the human body with technology, encompassing a wide range of devices that combine software, hardware, and communication capabilities in order to track personal health, sports, or wellness data, provide vital medical treatment or improve the comfort, function, health, or well-being of the body. By providing real-time data and utilizing artificial intelligence algorithms, IoB can aid in early health issue detection and enable quicker and more effective interventions.

Another area which benefits from IoB is business management. By using sensors and monitoring devices to collect information about workflow and employee productivity, these data can be used to identify efficiency issues and address them appropriately, potentially leading to an improved overall business productivity and performance.

The Internet of Bodies (IoB) is not a new concept but has evolved over time. The initial examples of such technology included hearing implants and prosthetics, which became increasingly sophisticated over the years. In the 2000s, wearable devices began to gain popularity and are now used by millions of people worldwide (Marr, 2019).

However, the term "Internet of Bodies (IoB)" was first used by the American researcher Michael Chorost in his 2011 book, "World Wide

Mind: The Coming Integration of Humanity, Machines, and the Internet." In his book, Chorost described a vision of the future in which technology could be used to connect people to the internet in a deeper way than existing wearable devices and implants.

In the years that followed, the concept of IoB has been further explored by researchers and companies worldwide. Today, there is a variety of technologies used in IoB, including cybernetic implants, wearable devices, and sensors (Fătu & Stancu, 2020).

An article from the December 2019 issue of Forbes by the futurist Bernard Marr explains the process in which people can be "monitored and controlled remotely" through wearable and implantable technology. The article refers to three generations of the Internet of Bodies (IoB), which include:

- *External body*: wearable devices, such as smartwatches, that can monitor our health.
- *Internal body*: cardiac stimulators, implants, and/or digital pills that go inside our bodies to monitor or control various aspects of health.
- *Embedded body*: the third generation of IoB that combines technology and the human body with real-time connectivity to a remote device.

The World Economic Forum in June 2020 fully embraced the era of the Internet of Bodies, stating: "We are entering the era of IoB by collecting our physical data through a range of devices that can be implanted, ingested, or worn." The result would be a vast amount of health-related data that could improve the well-being of people worldwide, as "tracking symptoms could help us stop the spread of infection and rapidly detect new cases." (Liu, 2020)

5. ADVANTAGES AND DISADVANTAGES OF IOB USAGE

The technology (IoB) is still in its early stages, and many of its potential applications are still in the research and development phase. However, there are already several technologies being used in IoB, including:

- **Cybernetic Implants**: These are devices that are implanted in the human body and enable direct communication between the body and

technology. For example, cybernetic implants can be used to enhance the functionality of a prosthetic limb or provide people with hearing impairments with better hearing.

- **Wearable Devices**: These are devices that are worn on the body and allow for the collection of data about the human body. For instance, a fitness tracker can collect data about a person's physical activity and sleep and send this data to a smartphone or computer for analysis and monitoring.
- **Sensors**: These devices can be used to measure various aspects of the human body, such as blood pressure, blood glucose levels, or body temperature. Sensors can be used to monitor health and detect problems before they become more serious.
- **Virtual and Augmented Reality**: These technologies can be used to create simulations of the human body and its organs, enabling doctors and researchers to better observe and study the structure and functioning of the body.
- However, (IoB) raises some ethical risks and concerns that need to be taken into consideration. Here are a few examples:
 - **Data Vulnerability**: (IoB) involves collecting and storing a large volume of sensitive personal data, which can increase data vulnerability to cyberattacks and misuse. It is essential to have proper security measures in place to protect these devices and the collected data.
 - **Discrimination**: (IoB) can be used to collect data that could be used to discriminate against certain groups of people, such as those with specific medical conditions or genetic characteristics. Clear rules should be in place regarding the use of such data in order to prevent discrimination (Rand, 2020).
 - **Lack of Privacy**: (IoB) can be used to monitor and collect significant amounts of personal data about people without their consent or awareness, which can lead to breaches of their privacy and intimacy. Adequate security measures are necessary to protect this data and prevent its improper use.
 - **Ethical Issues**: (IoB) can lead to ethical dilemmas, such as using data without people's consent or using it improperly.

- Technology Dependency: Using (IoB) can lead to dependency on technology and a reduction in people's abilities.
- Increased Social Inequality: The use of (IoB) can contribute to greater social inequality, as not everyone has access to the technology or healthcare services that utilize IoB.
- Data Control: Using (IoB) can result in the loss of control over one's own data and the decisions made based on it, as data can be collected and used by third parties without the individual's consent (Fastcodesign, 2015).
- Environmental Impact: The use of (IoB) can have a negative impact on the environment due to excessive energy consumption and the production of electronic waste.
- Inappropriate Data Usage: Improper use of data collected through IoB can lead to incorrect decision-making or undesired effects on people's health and well-being.
- Regulatory Issues: (IoB) involves the use of technologies and practices that are still evolving, which can lead to regulatory challenges and uncertainties regarding how data should be collected, stored, and used.

It is important to consider these potential issues and develop solutions to address them and minimize their impact on individuals and society as a whole. Additionally, it is crucial to ensure that the use of (IoB) is done responsibly, respecting the rights and privacy of the individuals and protecting them from the improper use of their data (Bazon, 2022).

6. CONCLUSIONS

The Internet of Bodies (IoB) represents a new frontier in technology with the potential of revolutionizing all fields. While there are many potential benefits and challenges for society related to IoB, there are also risks and ethical issues that need to be considered. It is important for developers and researchers to take these issues into account and develop IoB in a way that protects the confidentiality and privacy of data and avoids discrimination.

IoB and AI represent complex and powerful technologies that can transform the way human interactions with the environment and technology

take place. By combining them in a responsible and ethical manner, we can achieve innovative and beneficial solutions for the society. However, it is important to approach these areas with care and prioritize security and the protection of individual rights in order to prevent their misuse.

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