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Artificial Intelligence of Things (AIoT) Technologies, Benefits and Applications

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Abstract— Today's world is changing rapidly because of technological developments. Among the astonishing evolution, AIoT has become a new addition to machinery growth. This term is a compound of another two dominant infrastructures: Artificial Intelligence (AI) and the Internet of Things (IoT). AIoT intends to invent more efficient and improved IoT operations or services with enhanced data management and analysis capabilities. AI deals with machines, especially computer systems fields like natural language processing, speech recognition, etc. IoT is a system where interrelated devices and machines communicate and transfer data with different sensors without human intervention. AIoT can be more beneficial for both types of technology, where a vast amount of data obtained from IoT devices, will be handled by some powerful AI algorithms. When it needs to handle a lot of data, essential and efficient data processing is required to use the information gathered from IoT devices. Without integrating AI, IoT devices can't aid efficient services. Besides, AIoT is utilized to handle efficiency, scalability, accuracy, and fraud detection in transactions. This paper aims to show the potentiality of AIoT, its recent applications and benefits, and the probable future of this technology.

Keywords— Artificial intelligence of things, internet of things, artificial intelligence, technological developments

I. INTRODUCTION

Artificial intelligence is defined differently by different people. However, this term has not been inspected in the way how it should be. This term has two terms, one is “intelligence” which refers to the similar ability of a human being, but humans are different from animals and mechanical machines thanks to their mental and cognitive abilities. Besides, “artificial” mimics an artificial person more than an intelligent computer. Artificial Intelligence tries to blend the above-mentioned terms to replicate the intelligence of humans in a computer system[1]. There are different ways to define AI. AI is created by building a structure like human being, which includes neuron-like processing units that can work parallelly. However, this way can't be defined Artificial Intelligence properly. Another way to define AI is to study human psychology. It gives us the idea of how to operate a computer, but this behavioural way doesn't work well on a practical problem [2]. By creating a function or principle, AI can be well-defined and analyzed. Producing a new system by which any certain type of computation can be handled. This is actually a set of inputs that are mapped with some outputs where there are some neurons that work like a function. Here the functions are a set of cognitive that can operate [3] as searching, reasoning, planning, learning, communicating, perceiving, acting, etc.

The Internet of Things (IoT) has become a boon of advanced technology as it connects various devices under a network and creates a connection between them for the association. Moreover, it has been continuously evolving as IoT has potential opportunities. Thanks to the increasing amount of devices in every hand, where all are connected by wire or wirelessly, it can be possible to collect enormous amounts of data or information [4]. In the old era, Scientists and Computer Engineers implemented these things with everyday objects like vacuums, cars, and machines, but they were not cheap and smart, and faster compared to nowadays. IoT systems operate with real-time exchange of data in different ways as smart devices, IoT applications, and a graphical user interface [5]. Among them, IoT applications are more convenient for our everyday life. This application collects data from IoT devices under the cloud and uses machine learning and artificial Intelligence to evaluate those data to make an intelligent decision to work a device smartly, the decisions are then transferred back to the IoT devices. “Internet of Things” consists of two words. The first word is “Internet” a global system where all computers are interconnected, thus creating a network that uses two protocols, TCP/IP, to give service to billions of devices [6]. The network can be private, public, academic, business, and government, and a wide range of electronic, wireless, and optical networking technologies connect those. Another one is “Things” which can be a person or any object like electronic devices or technical products, namely, equipment and gadgets. These things help invent embedded devices, which can sense the environment and communicate and be traceable on the Internet [7].

Internet Society is concerned about IoT because it delineates how people and institutions interact with each other under different networks in their personal, social, and professional lives [8]. IoT systems operate with real-time exchange of data in different ways, such as smart devices, IoT applications, and a graphical user interface. This application collects data from IoT devices under the cloud and uses machine learning and artificial Intelligence to evaluate those data to make an intelligent decision to work a device smartly; the decisions are then transferred back to the IoT devices. Because of the complexity of collecting, processing, and analyzing enormous amounts of data, IoT has now enabled Artificial Intelligence. IoT has a probable future to create a modern world where devices will work with a similar potentiality to human beings. IoT manipulates devices that work with the connectivity of the internet, while AI trains those devices to learn from collected data and surrounding experiences. IoT systems work through five steps: Create; which is implemented by sensors; Communication, which

happens using the internet, Aggregate and Analyze, the integration of data and making the decision to behave and the last one is Act which is the crucial part of IoT [9] devices where AI can be applied to make a fast and accurate analysis. AI-enabled IoT guides a wide range of profit for every sector i.e., medical, Industrial companies, business, and education. To boost operation efficiency, machine learning combined with AI can ensure fast and ideal results by analyzing redundant and time-consuming tasks, which is not possible with single IoT devices. One important thing that has to be considered in any business or operation is risk. AI coupled with IoT can predict different threats because IoT can be present in any everyday device or wearable materials [10]. Sometimes the time of failure can help reduce costs thanks to AI enabling IoT to predict the failure of equipment by analyzing the behaviour of the machined devices. Thus by exchanging data with different devices, AI and IoT have thrown light on technological developments that can transform any business and industry with new opportunities.

Moreover, this research article focuses on definitions, components, working procedures, benefits, and applications of AIIoT. The main objective of this paper is to provide an overview of the Artificial Intelligence of Things, architectures, and vital technologies and their usages in our daily lives. However, this manuscript will give good comprehension for new researchers who want to do research in this field of AIIoT and facilitate knowledge accumulation efficiently. The paper is organized as follows. In Section II, an overview of Artificial Intelligence of Things is discussed along with the components and working procedure of AIIoT. Section III, the benefits and applications of AIIoT are analyzed. In the final section, Section IV, conclusions about the research have been made.

II. OVERVIEW OF ARTIFICIAL INTELLIGENCE OF THINGS (AIIoT)

Is there any link between IoT and AI? It can be a very powerful system by fusing these two things: Artificial Intelligence and the Internet of Things. It can be compared AI with the “brain” of any system, and IoT can be regarded as a “nervous system” which is quite similar to the human body where these two mentioned terms make an intelligent decision every moment in any certain task [9]. In a real scenario, integrating IoT and AI lets a system analyze the data collected from connected devices using IoT components and then make necessary actions based on the received data with Artificial Intelligence without any human interaction. This wonderful technology is currently advancing at a breakneck pace, and in the upcoming year, it will be an unavoidable element of everyday life [11]. However, these two streams equally aid the common persons and businessmen, and specialists. Recent surveys already depict that AI and IoT are playing a vital role in the business of technological companies [12]. They are financing huge amounts of money to increase efficiency and also have potential advantages. The trend of top companies funding money on AI and IoT is visualized in “Fig. 1”.

A. AIIoT Components

IIoT systems work through five steps which are:

- Create, which is implemented by sensors
- Communication, which happens using the Internet,

- Aggregate and Analyze, the integration of data and making the decision to behave and,
- The last one is the Act which is the crucial part of IIoT devices where AI can be applied to make a fast and accurate analysis.

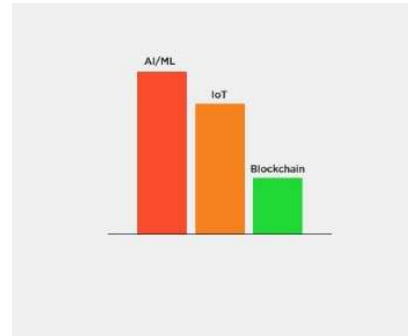


Fig. 1. Technologies Companies are investing in [12]

Finally, these two streams make a blended system where the precise value of the applications of IIoT is fixed in analyze step, which illustrates in “Fig. 2”, and this work is done by the power of AI(a significant role).

The “Fig. 3” depicts the components of AIIoT, without which it is not possible to invent efficient AIIoT products or services.

- **AI and IIoT:** Since the essence of IIoT devices is to gather data and store it for further shifting, infusing data from physical devices with artificial intelligence allows for the extension of those processes [13]. The Internet of Things (IIoT) uses artificial intelligence to bring more value to the IIoT domain by better interpreting data obtained from connected devices over a network. These two terms are a vital part of any AIIoT product.

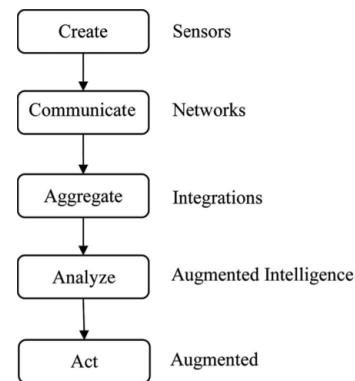


Fig. 2. AI and IIoT functional View [14]

- **Network:** The network is formed by different sensors or an application programming interface (API). These are used to collect data from the environment where several devices are attached. After that, the data are sent back to the cloud or edge computing devices for further processing. The common way of connecting sensors is Wi-Fi or cellular connection [15].
- **Edge Computing, Cloud:** Once the data is collected, software processes and records that data in the cloud or on an edge server. Edge computing is defined as a

mechanism where data is analyzed at the edge of a network before it is sent to the cloud. The cloud is nothing but the mass storage of data. In some circumstances, it is not always possible to store data on the cloud due to the poor connectivity of IoT devices. It is then processed in edge networks.

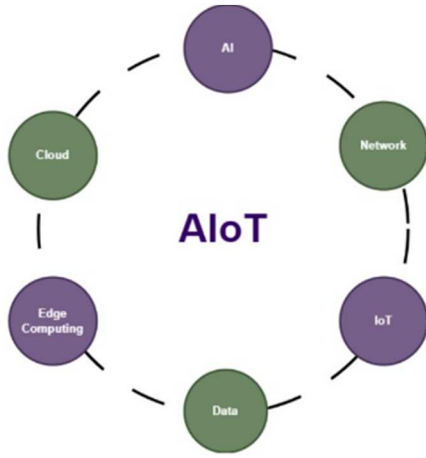


Fig. 3. AIoT Components [16]

- **Big Data:** Utilizing IoT devices, the collection of data is increasing rapidly through networks and devices. As a result, AIoT systems will be more intelligent by applying Deep learning models/algorithms to them.

B. Working Procedure

Many works are done on AIoT where several steps are followed to make AIoT products and services that can operate quite efficiently. The significant steps are illustrated below:

1) Architecture Design: Here, the basic design of AIoT products or services is made for further developments, which is a vital part, as it is needed to think of the accurate way to fuse these two powerful things. This is used to manage and minimize the complexity in developing and monitoring the AIoT solution of computational hardware and topology of the network. It can be implemented by multi-tiered architecture shown in “Fig. 5” where in each tier network, security, scalability, durability, and reliability are handled.

2) Build a network: A network refers to a collection of devices such as sensors, gadgets, appliances, and any computer software that make connections by communicating with each other and exchanging information and data without the need for human hands.

3) Data pre-processing and artificial intelligence generation: After collecting the data, that data is then stored in the cloud or on an edge server. If any modification is needed in the data set, pre-processing is done before applying AI algorithms. AI is embedded into these products, which are connected to networks. Artificial Intelligence has three cognitive abilities [17]:

- In this stage, it uses historical data and algorithms to perform analysis and learn from the pattern of data.
- Then, the algorithms are used to perform the task.
- To increase the accuracy and performance, a self-correcting process is run to monitor constantly.

The “Fig. 4” visualizes the workflow of AIoT, which is a continuous process to make AIoT products or any other AI power IoT services.



Fig. 4. How AIoT works [18]

III. BENEFITS AND APPLICATIONS OF AIOT

A. Benefits of AIoT

The combined power of AI and IoT gives so many blessings in every sector as healthcare, industries, agriculture, vehicles, and so on. By the evaluation of AIoT, everyone can get an automated lifestyle where there is less risk and more efficient and scalable products or services are available. Some of the advantages are listed below:

- **Improving Accuracy Rate:** Human brain can't analyze data continuously for a long time as it is a tedious job, and sometimes they are prone to making errors. AIoT has the power to handle large amounts of data that are error-free and have higher accuracy than human being. In some sensitive cases like ATM withdrawals or any of online payment and transaction which have fraudulent activities, AIoT can aid improved security with no loss of money [18].
- **Cost Reduction:** Predictive analysis that focuses on existing data, and based on the outcomes, it predicts possible future occurrence. AIoT products can give reports of future mishaps or device failure by its predictive algorithm, which is a part of Artificial Intelligence [19]. By this prediction, any company or person can take possible steps to minimize maintenance costs. Moreover, it helps to meet deadlines with regular servicing [10].

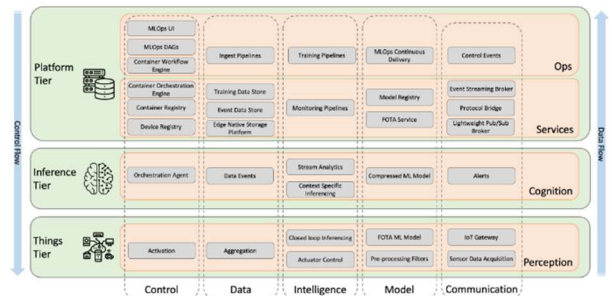


Fig. 5. The multi-tiered architecture [20]

- **Customer Satisfaction:** In terms of business or any products, customer satisfaction is a must thing. Large companies like Amazon, Alibaba, Zalando, and so on, have earned customer satisfaction which is before anything else. Human-based customer care sometimes

fails to meet customer satisfaction due to language, time, etc. By implementing chatbots, anyone can communicate their needs as per their choices. This system can handle a huge number of customers compared to human-based customer care.

- **Scalability:** IoT devices can gather floods of data. AIIoT systems can analyze and gather the data before transferring it to another device. This assists in connecting an enormous amount of IoT devices.
- **Increased efficiency and cost:** AI-powered IoT products can give precise predictions which assist in time and consuming results in any business. This is very essential for large-scale companies as they can modify the error and update the fixing on time [18].

B. Applications of AIIoT

1) Healthcare Architectures: AIIoT technologies connect different products or equipment with the potential to see, hear and think to make decisions and to work together. They communicate with each other to make their final judgment in any situation. In the healthcare sector, there are enormous opportunities to implement AIIoT like telecare, prevention, monitoring, connected inhalers, blood testing, and so on. The “Fig. 6” shows some AIIoT-based healthcare equipment. Some of the implemented healthcare systems are given below:

a) Repairing of any physical damage has drawn the attention of much research work, where a framework is built to produce a recovery plan based on a particular patient's symptoms, and a chart is included to track the symptoms and illnesses following the treatment [21].

b) Health Insurance Companies are taking advantage of the lights of AIIoT by collecting data from different healthcare equipment and giving proper insurance policies. These companies also get the data from customer reviews or any kind of fraud activity [22]. Customers also got benefitted from this as they can see all data-driven decisions.

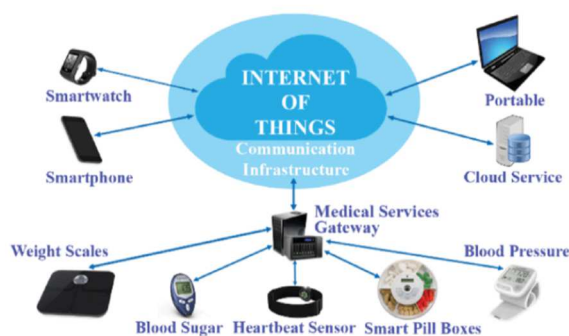


Fig. 6. Healthcare Products [23]

c) Blood Coagulation is also possible to test sitting own house by Bluetooth enabled Blood Coagulation device. This is a valuable device for those patients who are afraid of bleed. The “Fig. 7”, displays some Wireless medical devices.

d) A clinical study was held where Cancer Treatment was given by a Bluetooth device, where by the patient while getting care. Blood pressure, pulse, and weight were monitored to give the doctor's advice. This resulted in a nice

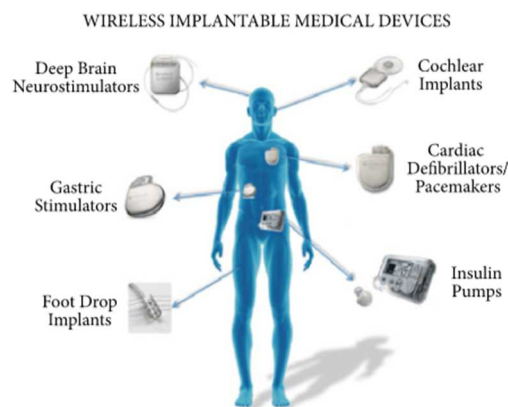


Fig. 7. Wireless implantable medical devices [23]

improvement compared to the patient who was not taking this treatment [24]. It was proven that more doctor-patient interaction gives better recur.

e) After the COVID-19 breakdown, most people got depressed and lost their motivation to work. Therefore, sometimes it leads to death. In such cases, Depression-Monitoring Smartwatch App can throw light by providing continuous monitoring of patients with the advice of a consultant. Remote health monitoring is yet another useful AIIoT application which mitigates the need for hospital resources [25].

2) Blockchain: Blockchain has the potential to resolve numerous problems related to AIIoT. Many fields like economy, society, IT field and so on can benefit without any dedicated server. Several works are done in this field. Among them, data integrity verification technique optimization can be a great solution to many security-related issues with less processing time [26]. After the Fourth Industrial Revolution, modern technologies are growing to invent different devices. Blockchain is a database that is decentralized, implementing this system can prevent all types of forgery and tampering activities in transactions. Multiple hash functions can be implemented in AIIoT devices where generated information obtained from the blockchain is sent to IoT devices before sending to the final destination. Subnetting efficiency can be improved by implementing blockchain technology. This also helps to minimize information loss.

3) AIIoT Based Smart Agricultural System: Living in this era of modern technologies, AIIoT can bring exciting outcomes for the welfare of every sector. Now, It is needed to generate the best models or methods for utilizing this amazing system for a better future. Moreover, The growing number of smartphones and their widespread network connectivity present a growing opportunity for the development of smartphone-based agricultural sensor systems [27].

4) AIIoT based Banking System: Around 80% banks are aware of the benefits that AIIoT is likely to bring to the sector: increased efficiency to processes, the chance to provide frictionless customer experiences, and the

opportunity to beat the competition. Here are some examples of what the AIIoT can accomplish in banking-

a) Fraud detection: Some creative businesses are using Behavioral AI to assist financial institutions in identifying irregularities and fraud. It is a machine learning model that has been taught to recognize anomalies. It monitors, evaluates, and gathers information on countless numbers of client bank transactions. These transactions are connected to Internet of Things (IoT) equipment like smart ATMs, smartphone applications, smart cards, or pay wear products. Certain transactions will have inaccurate or non-system data. Fraudulent transactions and suspicious behavior will be recorded. The Behavioral AI model will then use an algorithm to identify fraudulent and legitimate transactions.

b) Operations: Companies are spending money on research and development to create smart ATMs. Banks use smart ATMs for asset financing, fleet management, and physical ATMs. This linked solution improves ATM fleet efficiency and security for banks and financial enterprises. AI gathers business information and advises banks on how to enhance ATM efficiency and client security. This machine learning model trains on millions of ATM transactions like the fraud detection model. It gathers, analyses, and creates algorithms from:

- i. How many credit cards have been rejected
- ii. How long it takes to process transactions
- iii. How quickly the ATMs serve customers

The system will determine the longest customer wait times and card rejection causes. It will also impact how long clients spend at the ATM screen, how much traffic it handles, and how swiftly it processes transactions. "By using IoT and AI in payment methods, banks are working to transform their back-end processes and integrate them with front-end systems to develop a holistic and robust finance operation." – ISG [28].

5) AIIoT-based Supply Chain Management System: In today's competitive business world, supply chain management is one of the most important issues that affects everything a company does to make products and services that customers need. Practitioners and scholars have focused on supply chain and IT management for a decade. A lot of new ideas and challenges are coming out of the technological revolution in supply chain logistics. Even though digital technologies are fast, customers expect the ordering and delivery process to be faster. As a result, organizations that want to add new technologies find it easier and more efficient to do so. Companies have a strong tendency towards integration, which can be seen in how they use IT. Integration improves sensitive supply chains by exchanging useful information. New supply chain technology has improved information transmission and product tracking. Information technology helps plan, execute, regulate, and store products, services, and information from origin to consumption to improve customer satisfaction. The Internet of Things (IoT) revolution in information technology has changed several sectors, including supply chain management. AI-enabled IoT devices can evaluate data, make judgments, and act without human interaction. AIIoT, which combines the IoT with AI, lets firms use both at once. This technology's transparency,

agility, and supply chain adaptation provide a great opportunity to solve supply chain management problems [29].

IV. CONCLUSION

In this paper, it is stated that AIIoT-based systems have numerous applications which give a lot of advantages in creating a new era where without any human interaction, AIIoT products or services will operate by themselves. While AIIoT serves as the brain, processing received data to enable devices to understand context, recognize patterns, and make decisions without human intervention, IoT acts as the nervous system, facilitating communication between devices. AIIoT goes beyond IoT by introducing intelligence into the network, allowing devices to interact with other devices and share data. As a result, AIIoT enhances the potential of networked devices by giving them an extra layer of intelligence that lets them function independently and make predictions based on the analysis of data [30]. From previous surveys, it is clear that AI-powered IoT systems are increasing day by day because of the huge number of devices operating all over the world, and near future, it will outweigh the benefits of other available or newbie technologies. Here we also analyzed some techniques of AIIoT, which are already employed in different fields. In this work, we have analyzed Banking, Agriculture, Healthcare, Blockchain and Supply chain management. The blessing of AIIoT is more valuable for the healthcare industry as this is the most sensitive issue and needs more expertise to handle. Moreover, in terms of transactions, validation of the correct persona is also vital for banks and accessing user accounts. Overall, this technology can aid numerous dominance in this era of technology.

REFERENCES

- [1] P. Wang, "What Do You Mean by "AI"?", AGI, 2008, pp. 362–373.
- [2] S. Crowder, James and Friess, "Artificial psychology: The psychology of AI," *People*, vol. 2, no. 4–5, 2012.
- [3] J. Wu, Yu-chen and Feng, "Development and application of artificial neural network," in *Wireless Personal Communications*, Springer, 2018, pp. 1645–1656.
- [4] R. Khan, S. U. Khan, R. Zaheer, and S. Khan, "Future internet: The internet of things architecture, possible applications and key challenges," in *Proceedings - 10th International Conference on Frontiers of Information Technology, FIT 2012*, IEEE, Dec. 2012, pp. 257–260. doi: 10.1109/FIT.2012.53.
- [5] G. Shen and B. Liu, "The visions, technologies, applications and security issues of Internet of Things," in *2011 International Conference on E-Business and E-Government (ICEE)*, IEEE, May 2011, pp. 1–4. doi: 10.1109/ICEBEG.2011.5881892.
- [6] G. Nunberg, "The advent of the internet," *12th April. Courses*, 2012.
- [7] E. A. Kosmatos, N. D. Tselikas, and A. C. Boucouvalas, "Integrating RFIDs and Smart Objects into a Unified Internet of Things Architecture," *Adv. Internet Things*, vol. 01, no. 01, pp. 5–12, 2011, doi: 10.4236/ait.2011.11002.
- [8] M. U.Farooq, M. Waseem, S. Mazhar, A. Khairi, and T. Kamal, "A Review on Internet of Things (IoT)," *Int. J. Comput. Appl.*, vol. 113, no. 1, pp. 1–7, Mar. 2015, doi: 10.5120/19787-1571.
- [9] D. A. Stewart, John C and Davis, Gary Alan and Igoche, "AI, IoT, AND AIIoT: DEFINITIONS AND IMPACTS ON THE ARTIFICIAL INTELLIGENCE CURRICULUM," *Issues Inf. Syst.*, vol. 21, 2020.
- [10] T.-W. Sung, P.-W. Tsai, T. Gaber, and C.-Y. Lee, "Artificial Intelligence of Things (AIIoT) Technologies and Applications," *Wirel. Commun. Mob. Comput.*, vol. 2021, pp. 1–2, Jul. 2021, doi: 10.1155/2021/9781271.

- [11] B. Marr, "What is the artificial intelligence of things? When AI meets IoT," *Enterp. Tech*, December, 2019, doi: What is the artificial intelligence of things? When AI meets IoT.
- [12] Vinugayathri, "AI and IoT Blended." [Online]. Available: <https://www.clariontech.com/blog/ai-and-iot-blended-what-it-is-and-why-it-matters>
- [13] P. Wang, "On Defining Artificial Intelligence," *J. Artif. Gen. Intell.*, vol. 10, no. 2, pp. 1–37, Jan. 2019, doi: 10.2478/jagi-2019-0002.
- [14] "Functional View of AI-Enabled IoT." [Online]. Available: https://ebruary.net/201923/engineering/functional_view_enabled
- [15] "IoT Networks." Accessed: Apr. 06, 2022. [Online]. Available: <https://www.celona.io/network-infrastructure/iot-network>
- [16] "AIoT Components." [Online]. Available: <https://ko.wikipedia.org/wiki/AIoT>
- [17] A. Hintze, "Understanding the four types of AI, from reactive robots to self-aware beings," *Conversat.*, vol. 14, 2016.
- [18] A. Shrivastava, "Introduction to the Internet of Intelligent Things (IoT)." Accessed: Mar. 14, 2019. [Online]. Available: <https://dzone.com/articles/iot-amp-ai-the-internet-of-intelligent-things-iiot>
- [19] M. Y. Ali, S. Bin Naeem, and R. Bhatti, "Artificial intelligence tools and perspectives of university librarians: An overview," *Bus. Inf. Rev.*, vol. 37, no. 3, pp. 116–124, Sep. 2020, doi: 10.1177/0266382120952016.
- [20] A. Goja, "The Architect's Guide to the AIoT." Accessed: Mar. 21, 2022. [Online]. Available: <https://techblog.cisco.com/blog/architects-guide-to-aiot-1>
- [21] G. Wolgast, C. Ehrenborg, A. Israelsson, J. Helander, E. Johansson, and H. Manefjord, "Wireless Body Area Network for Heart Attack Detection [Education Corner]," *IEEE Antennas Propag. Mag.*, vol. 58, no. 5, pp. 84–92, Oct. 2016, doi: 10.1109/MAP.2016.2594004.
- [22] S. M. Riazul Islam, Daehan Kwak, M. Humaun Kabir, M. Hossain, and Kyung-Sup Kwak, "The Internet of Things for Health Care: A Comprehensive Survey," *IEEE Access*, vol. 3, pp. 678–708, 2015, doi: 10.1109/ACCESS.2015.2437951.
- [23] A. A. Pise *et al.*, "Enabling Artificial Intelligence of Things (AIoT) Healthcare Architectures and Listing Security Issues," *Comput. Intell. Neurosci.*, vol. 2022, pp. 1–14, Aug. 2022, doi: 10.1155/2022/8421434.
- [24] A. A. Pise, "IoT-based biomedical healthcare approach," in *The Internet of Medical Things: Enabling technologies and emerging applications*, Institution of Engineering and Technology, 2021, pp. 35–53. doi: 10.1049/PBHE034E_ch3.
- [25] D. T. Singampalli and A. A. Pise, "AI-Based Internet of Things (AIoT)," 2023, pp. 105–130. doi: 10.4018/978-1-6684-6519-6.ch007.
- [26] S.-H. Sim and Y.-S. Jeong, "Multi-Blockchain-Based IoT Data Processing Techniques to Ensure the Integrity of IoT Data in AIoT Edge Computing Environments," *Sensors*, vol. 21, no. 10, p. 3515, May 2021, doi: 10.3390/s21103515.
- [27] H. K. Adli *et al.*, "Recent Advancements and Challenges of AIoT Application in Smart Agriculture: A Review," *Sensors*, vol. 23, no. 7, p. 3752, Apr. 2023, doi: 10.3390/s23073752.
- [28] A. Greenwood, "Artificial Intelligence of Things (AIoT) & the Role it Plays in Banking." [Online]. Available: <https://www.globalbankingandfinance.com/artificial-intelligence-of-things-aiot-the-role-it-plays-in-banking/>
- [29] H. Nozari, A. Szmelter-Jarosz, and J. Ghahremani-Nahr, "Analysis of the Challenges of Artificial Intelligence of Things (AIoT) for the Smart Supply Chain (Case Study: FMCG Industries)," *Sensors*, vol. 22, no. 8, p. 2931, Apr. 2022, doi: 10.3390/s22082931.
- [30] "What is AIoT? How does it differ from traditional IoT?" Accessed: Apr. 08, 2024. [Online]. Available: <https://www.kaaiot.com/iot-knowledge-base/how-does-aiot-differ-from-traditional-iot>