

# AI TOOLS FOR NETWORKING: A SURVEY

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## ABSTRACT

Over the past few decades, there has been a significant development in the technology industry. Major technological advances like the Internet and automation are now the centre of attention. Technology that can perform significant tasks that were previously thought to be impossible has already been invented by humans. One of the most cutting-edge technologies that enable humans to copy and carry out a range of jobs is artificial intelligence. This paper focuses on the role of artificial intelligence in computer networks. One must first understand the ideas related to artificial intelligence and networks in order to properly understand what artificial intelligence is and how it functions in computer networks. AI networking has the potential to significantly increase productivity by upending established traditional networking practices. Artificial intelligence networking is an evolution of AIOps (AI for IT operations) that focuses on ongoing management, maintenance and optimization of a network. It combines AI with networking infrastructure to automate and optimize IT operations. Where AIOps has a broader focus on the information and operations (I&O) infrastructure level, AI networking is specific to the networking domain (data center switching, wired, wireless, LAN, WAN, SD-WAN, multicloud).

**Keywords:** Artificial Intelligence, Networking, AI Tools.

## 1. INTRODUCTION

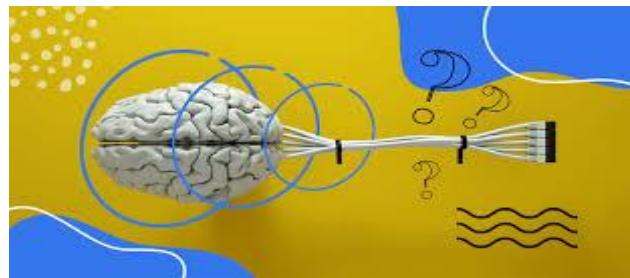
Computer Networks [1] have been a protracted revolution in technology. People may now communicate with one another, exchange information and even store data online because of the development of the

Internet. The Internet [4] has grown in importance in people's lives. Individuals are depending more and more on the Internet. On the other hand, artificial intelligence technology refers to the use of technology to create a machine that has human-like thought processes, decision-making abilities, and task performance. Artificial Intelligence is a vast

field with the potential to intervene and have a sudden impact on technological advancement due to its placement within computer networks. Recent years have shown us that technology has a bright future ahead of it. The rate of invention keeps speeding up, and major investments in AI research are being made by corporations like Apple, Google&Amazon. Automation will play a bigger role in our daily lives as more people enter the workforce with transferable abilities. This is because automation isn't only about replacing employment; it's also about reinventing how people do their jobs now. A wide range of additional disciplines are included in the field of artificial intelligence. Mathematics, statistics, networking, perception and logical thinking, and statistics are the main areas that artificial intelligence covers. Artificial intelligence uses networking to automate certain operations. AI researchers may apply their theories to NLP, Neural Networks and Expert System. AI has the potential to assist global collective intelligence in addressing some of humanity's problems when used properly. Artificial intelligence can be used to improve the intelligence and usability of computer networks using network technology. When artificial intelligence is used with network technology, computer networks can become more intelligent and user-friendly.

## 2. ARTIFICIAL INTELLIGENCE

Artificial intelligence [2,3,5] is a branch of computer science that deals with creating systems that can perform tasks that typically require human intelligence. These tasks include learning, reasoning, problem-solving, perception, and language understanding. We can also say that the simulation of human intelligence in robots that are designed to think and behave like people is known as artificial intelligence.

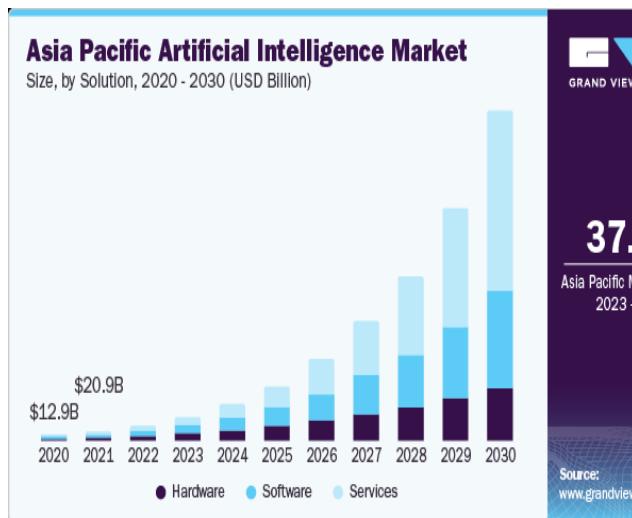


**Figure 1:** Transformation of Human Intelligence

Figure 1 depicts the transformation of human intelligence through digital means. AI systems can be designed to operate autonomously or to augment human capabilities in various fields such as healthcare, finance, transportation, education, and entertainment. AI has the potential to revolutionize industries, improve efficiency and solve complex problems but it also raises ethical and societal concerns that need to be addressed as the technology advances.

## 3. AI GROWTH GRAPH MARKET

As illustrated in figure 2, the size of the worldwide artificial intelligence market [4,5] was estimated to be USD 196.63 billion in 2023 and is expected to rise at a compound annual growth rate (CAGR) of 37.3% from 2023 to 2030. The industry verticals of automotive, healthcare, retail, finance, and manufacturing are leading the way in the adoption of sophisticated technology through their constant innovation and research initiatives. For instance, in December 2023, Google LLC launched 'Gemini', a large language AI model. Google's new Gemini model would come with three variants Gemini Nano, Gemini Pro, and Gemini Ultra. Gemini stands from its competitors out due to its native multimodal characteristic.



**Figure 2: AI Market Scenario**

#### 4. COMPUTER NETWORKING

Two or more computers connected by wired (cables) or wireless (Wi-Fi) networks [6,7,8] are called a computer network because they are meant to transfer, exchange, or share resources and data. Hardware (such as switches, routers, access points, and cables) and software (such as operating systems or business apps) are used to establish a computer network. A computer network's geographic location frequently defines it. A wide area network (WAN) can connect computers across continents, whereas a local area network (LAN) connects computers within a specific physical space, such as an office building. The world's largest wide area network (WAN), the internet links billions of computers globally. A computer network can also be characterized by the protocols it employs for communication, the way its parts are physically put together, the way it manages traffic, and its intended application. Computer networks make communication possible for all commercial, recreational, and scientific needs. Computer networks are necessary for the existence of the internet, online search, email, social networks, live streaming, online commerce, and audio and video sharing.

#### 5. AI NETWORKING TOOLS [9,10,11]

##### 5.1 *Insightful*

An AI-powered coaching platform called *Insightful* offers individualized, on-demand coaching in areas including relationships, job, and general life. The coaching is available at any time and location, with a specific focus on needs. The tool also includes a blog with the latest insights on living a fulfilling life and features accountability coaching to help young professionals reach their full potential. The use cases include navigating challenges of remote work, self-reflection coaching for wellness, and finding one's path in life.

##### Features:

- Provide personalized on-demand coaching
- Focus on specific needs
- Available anytime, anywhere
- Blog with latest insights on living a fulfilling life
- Accountability coaching to help young professionals reach full potential

##### Insightful use case ideas -

- Navigating challenges of remote work.
- Self-reflection coaching for wellness.
- Finding one's path in life via interaction with AI.
- Accountability coaching for young professionals.
- Improving relationships.

##### 5.2 *Linked XP*

The AI tool enhances the LinkedIn experience with microservices and AI-assisted rewrite features for creating new posts, job announcements, and more. It also helps with navigating the platform with confidence and etiquette. The tool is available for paid trial users and subscribers with pricing options ranging from \$4.99 for 7 days to \$200/year.

The tool is developed by Studio M64 and offers privacy and terms of service.

Features:

- Micro services
- AI-assisted rewriting features
- Confidence and etiquette navigation
- Paid trial users
- Subscribers

Linked XP use case ideas -

- Enhancing LinkedIn posts and job announcements.
- Navigating LinkedIn with confidence and etiquette.
- Improving LinkedIn engagement and visibility.

### **5.3 TaskMatrix.AI by Microsoft**

TaskMatrix.AI is an ecosystem that connects millions of APIs for task completion with foundation models. TaskMatrix differs from the majority of earlier research that tried to enhance a single AI model. In order to do a variety of tasks in both the digital and physical realms, artificial intelligence focuses more on leveraging pre-existing foundation models (as a brain-like core system) and APIs of other AI models and systems (as sub-task solvers).

Features:

- Connecting
- Completing tasks
- Visual domain
- Foundation models

TaskMatrix.AI by Microsoft use case ideas:

- Automated image recognition.
- Smart home automation.
- Natural language processing.

### **5.4 Juniper MistWireless (Wi-Fi) Assurance**

Mist AI powers Wi-Fi Assurance, a machine learning-driven cloud service. In addition to offering unique insight into user service levels, it substitutes laborious manual troubleshooting activities with automated wireless operations, making Wi-Fi predictable, dependable, and measurable.

Configure and monitor pre- and post-connection parameters, or important wireless criteria, like throughput, capacity, coverage, and connect time. By automatically capturing packets for event correlation and utilizing radio resource management (RRM) at the client level, anomaly detection creates network intelligence.

## **6. CONCLUSION & FUTURE SCOPE**

It is safe to state that AI is still in its infancy and has a long way to go even accounting for all of the research and analysis done. Since it is self-sustaining and always under growth, it is far from complete and may never reach it. As time goes on, new risks will emerge that AI will still need to learn how to handle. Artificial intelligence can be harmful as well as beneficial. But for many, it can have a significant effect on their quality of life. In conclusion, artificial intelligence is becoming more and more well-liked, and for good cause. Growing cyberthreats require a more proactive strategy, which AI can currently only offer. It's expected that in a few more years, more sophisticated AI versions will emerge, improving upon existing technology and providing safer networking options.

## **References**

- [1] Benedict Frederick (2022). Artificial Intelligence in Computer Networks: Role of AI in Network Security, Masters of Communication Systems and Networks, Tampere University, pp. 1-64.
- [2] S. A. Oke (2018). A literature review on "artificial intelligence", International Journal of Information Management Sciences, vol. 19, no. 4, pp. 535-570.
- [3] W. Guo (2020). Explainable Artificial Intelligence for 6G:

Improving Trust between Human and Machine, IEEE Communications Management, vol. 58, no. 6, pp. 39-45.

[4] Ye Tao (2020). Exploring the application of AI in Computer Network Technology, Computer Products and Circulation, no. 01, pp. 40-41.

[5] Kuntian Chen (2019), "The Application of AI in Computer Network Technology, Electronic Technology and Software Engineering, no. 24, pp. 245-246.

[6] Jiaju Wang and Ke Shen (2017). The Application Analysis of Artificial Intelligence in Computer Network Technology, Electronic test, no. 09, pp. 70-61.

[7] X. Shen, J. Gao, W. Wu, K. Lyu, M. Li, W. Zhuang, X. Li, and J. Rao (2020). AI-Assisted Network-Slicing Based Next-Generation Wireless Networks, IEEE Open Journal of Vehicular Technology, vol. 1, pp. 45–66.

[8] X. Shen et al. (2021) Data Management for Future Wireless Networks: Architecture Privacy Preservation and Regulation, IEEE Network Mag., vol. 35, no. 1, pp. 8-15.

[9] R. Li et al. (2017). Intelligent 5G: When cellular networks meet artificial intelligence. IEEE Wireless Communications, vol. 24, no. 5, pp. 175-183.

[10] Biswal, A. (2022). AI Applications: Top 14 Artificial Intelligence Applications in2022. Retrieved from Simple Learn:<https://www.simplilearn.com/tutorials/artificialintelligence-tutorial/artificial-intelligence-applications>

[11] Othman, A. (2019). Developing Network System with Artificial Intelligence. Retrieved from [https://www.academia.edu/39199689/Developing\\_Network\\_System\\_with\\_Artificial\\_Intelligence](https://www.academia.edu/39199689/Developing_Network_System_with_Artificial_Intelligence)