Advanced Engineering Days

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Usability of cyber security with artificial intelligence

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Cite this study: Kayıran, H. F., & Ergül, A. (2022). Usability of cyber security with artificial intelligence. 5th Advanced Engineering Days, 33-36

Keywords
Artificial intelligence
Cybercrime
Nano technology
Mechanic

Abstract

Nowadays, the Internet has become widespread in every field. With the spread of the Internet, cybersecurity has emerged as an issue per se. Artificial intelligence is used quite often today. The field of use of artificial intelligence is proportional to technology. Cybercrime is all criminal activity that targets or uses a device connected to a computer. Most cybercrime is carried out by cybercriminals or hackers who want to make money. The word cyber is used to describe concepts involving computer networks. Recently, the concept of cybersecurity has entered the literature due to the innovations brought by technology. With this study, a literature review of the use of artificial intelligence in the fight against cybercrime was conducted. The results obtained were compared with each other in this study.

Introduction

Cyber security; protecting data, networks, programs and other information from unauthorized access. Today, security should be considered on its own. Different software can be developed for data protection. Countries create their own projects in catching national security and world technology in information systems [1]. Nowadays, internet access is available everywhere and social media can be used at any time thanks to mobile phones. In this context, artificial intelligence plays an important role. Cybercrime can be carried out by individuals or groups. Artificial intelligence is the use of the human brain as a computer, Cyberspace; It is a global networked, computer-managed multidimensional artificial or virtual reality [2]. cyber environment; It consists of software, hardware and communication infrastructure. To give an example of equipment; servers, processors, laptops, satellite systems [3]. Technological developments and the widespread use of the Internet have begun to change people's social behavior. Along with cyber developments, the concept of crime has also been transformed. It has found itself right in human life [4].

Material and Method

Although artificial intelligence usually refers to the intelligence displayed by machines, it has become an innovative technology that takes place in many aspects of our lives, from semi-autonomous cars on the road to robotic vacuum cleaners in our homes [5].

Artificial intelligence with a different definition; is to ensure that machine equipment has the intelligence and ability of humans through artificial methods. There is no precise definition of artificial intelligence in the scientific community, as scientists continue to have doubts about intelligence [6]. Artificial Intelligence and its subsets are given in Figure 1.

Machine learning, defined as algorithms that parse datasets and then learn to apply what is learned to make informed decisions, is a subcomponent of artificial intelligence. Machine Learning is a branch of artificial intelligence that uses computer science. Machine learning is all algorithms that mimic human intelligence. In the machine learning model, learning takes the form of teaching-teaching (training) and testing (testing). In the learning phase, a learning model is created by learning algorithms and features into the system using the examples

in the data set. In the experiment phase, predictions are made for the trial data with the learning model application Engine [8-9-10]. The machine learning model is given in Figure 2.

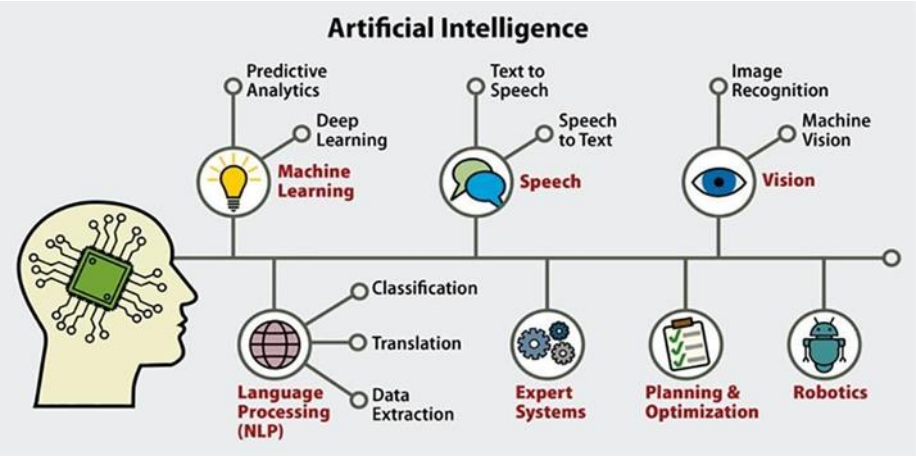

Figure 1. Artificial Intelligence and its subsets [7]

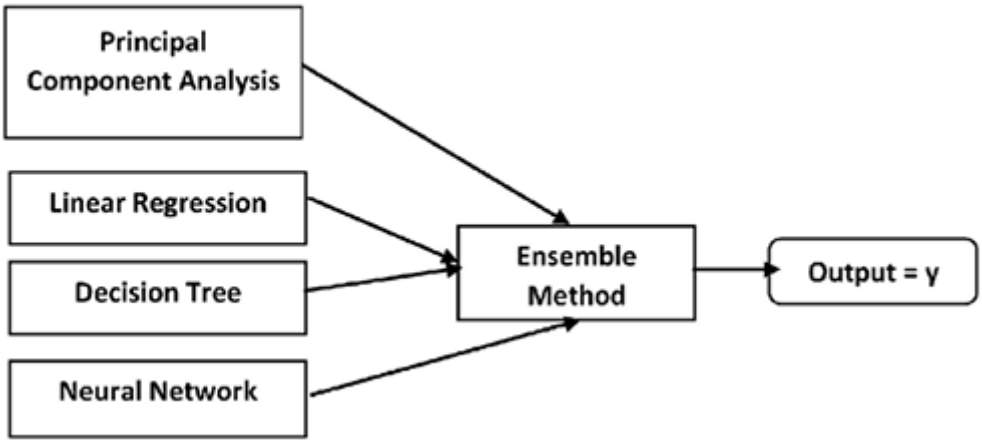

Figure 2. Machine Learning Model [11]

Artificial intelligence and cyber security are closely related. Literature studies of the studies in this field are shared in order. With the use of artificial intelligence, financial services can occur in everyday scenarios such as fraud detection, retail purchase forecasting and online customer support interactions. Fraud detection can be made through artificial intelligence. Initial scoring of loan applications in the financial services industry uses artificial intelligence to understand creditworthiness. More advanced artificial intelligence extensions are used to monitor and detect fraudulent payment card transactions in real time. Also, Virtual customer support (VCA). Call centers use VCA to anticipate and respond to customer inquiries other than human interaction. Voice recognition combined with simulated human dialog is the first point of interaction in a customer service inquiry. High-level questions are directed to a person. Banks can be contacted via the chat robot on the web page. Advances in artificial intelligence for applications such as natural language processing (NLP) and computer vision (CV) help industries such as financial services, healthcare and automotive to accelerate innovation, improve customer experience and reduce costs [12]. The changing understanding of security in international relations and Turkey's cyber security strategies have been researched. In another study; The effect of cyber security training on the awareness, knowledge and behavior levels of pre-service teachers was investigated. At the end of the study; As a matter of fact, qualitative findings also support quantitative results. According to the qualitative findings, the students in both the experimental and control groups revealed that they were informed about the cyber security issue, gained awareness and acted towards providing cyber security in daily life thanks to the education. Study of the cyber security measures: Comparative work of the United States and Turkey [13-14]. For example, in a study; It is possible to come across studies on usage in different fields of artificial intelligence in the literature. In general, in different studies; The applicability of artificial intelligence in the field of food has been investigated [15]. In order in different studies; A literature search on the applicability of machine learning, which is a sub-branch of artificial intelligence, in the field of mechanical engineering was conducted. By creating mathematical programming, the stresses occurring in rotating cylinders and thermoplastic discs, discs with B4C (Boron carbide) material, Sic/6061 Al Alloy Composite discs and discs with different materials were investigated. A literature search on the

applicability of artificial intelligence in mechanical engineering was conducted. In a different study; Development of individualized education system with artificial intelligence fuzzy logic method has been investigated. In another study, the legal dimension of artificial intelligence was investigated by literature review [16-26].

Fundamental principles of cyber security: The concepts of confidentiality, accessibility and integrity can be called the "CIA triad" [27].

Figure 3. CIA Trio

Results

In this study, literature studies on the applicability of Artificial Intelligence in the field of cyber security were investigated. Cyber attackers can use a lot of software and code in cyberspace to commit cybercrime. It is thought that sub-branches of artificial intelligence can be used to analyze this software and codes. In the study, the definition of artificial intelligence was made and the applicability of academic studies in the field of cyber security was investigated. In the results of working; It is thought that cyber threats can be combated with programming created using artificial intelligence.

References

1. Aydin E. (1992). Introduction to Information Crimes and Law. Ankara: Doruk Yayınları. Ankara.
2. Gibson, W. (1984). Neuromancer, (Trans. M. Altintas), Gündüz Publications, Istanbul.
3. Tiirmaa-Klaar, H. (2016). Building national cyber resilience and protecting critical information infrastructure. *Journal of Cyber Policy*, *1*(1), 94-106.
4. Eroglu, C. (2022). The size of cyber-crimes that businesses are exposed to and its impact on businesses. Academy of Gendarmerie and Coast Guard / Institute of Security Sciences / Department of Crime Research, Master's Thesis, 245s.
5. Li, J. H. (2018). Cyber security meets artificial intelligence: a survey. *Frontiers of Information Technology & Electronic Engineering*, *19*(12), 1462-1474.
6. Wang, H., Feng, Y., Xing, B., Zhang, X., Wang, Z., Wu, J., & Huang, X. (2021, December). A Blockchain-based Protocol for Power Data Preservation in Ping Dingshan vs. Wang Case. In *2021 IEEE 4th International Conference on Electronics and Communication Engineering (ICECE)* (pp. 43-48). IEEE.
7. AI, (2022). Access address: https://What-is-Artificial-Intelligence .jpg (940×485) (dark-network.net). Access date:25.11.2022.
8. Candan, H. (2019). Comparison of the performance of machine learning methods in the diagnosis of lung diseases with the speed of sound transmission. Ege University, Institute of Health Sciences, Department of Biostatistics and Medical Informatics, Izmir.
9. Sandhya, N. & Dhage, R.C.K. (2016). A review on machine learning techniques. International Journal on Recent and Innovation Trends in Computing and Communication, 4(3), 139-159.
10. Bayrak, E. (2020). Evaluation of the Interaction of Artificial Intelligence and Space Design in Today's Design Education. Hacettepe University, Institute of Fine Arts, Master's Thesis, 1-142s.
11. Sen, J., Mehtab, S., & Engelbrecht, A. (2021). *Machine Learning: Algorithms, Models and Applications*. BoD–Books on Demand.
12. Sas, (2022). Access address: https://www.sas.com/tr_tr/insights/analytics/yapay-zeka-nedir. Access date:20.11.2022.
13. Ocal, A. (2022). The Changing Understanding of Security in International Relations and Turkey's Cyber Security Strategies. T.C. Trakya University Institute of Social Sciences Department of International Relations Master's Thesis, 112p

14. Acar, P. & Ulutaş, A. (2021). Content Analysis of Graduate Theses Written on Cyber Security in Turkey. International Journal of Social Sciences in Turkish Cultural Geography, 6(1), 93-113.
15. Kayıran, H. F. (2020). The Availability of Artificial Intelligence in the Field of Food Engineering, 4. International Mersin Symposium, 4(1), 74-86.
16. Kayıran, H. F. (2022). Investigation of the applicability of artificial intelligence and machine learning in the field of health. *Advanced Engineering Days (AED)*, *3*, 16-19.
17. Kayıran, H. F. (2022). Investigation of stress in rotating cylinders with gray irons (Grade G4000) materials by mathematical programming. *Advanced Engineering Days (AED)*, *4*, 100-102.
18. Kayıran, H.F. (2021). Artificial intelligence in mechanical engineering (Machine Learning). 5th International Congress On 3d Printing (Additive Manufacturing) Technologies and Digital Industry (3D-PTC2021), 5(1), 49-49.
19. Kayıran, H. F., & Kayiran, H. F. (2020). Investigation of elastic tensile behavior of thermoplastic discs reinforced with steel wires. *Akıllı Sistemler ve Uygulamaları Dergisi*, *3*(2), 73-76.
20. Kayıran, H. F. (2019). Thermal Stress Analysis of a Boron-Carbide (B4C) Disc. 2. International Mediterranean Symposium, 1(1), 159-174.
21. Kayıran, H. F. (2021). Numerical Analysis of Displacements in a Disc Model from Sic/6061 Al Alloy Composite. 5. International Congress on 3D Printing Technologies and Digital Industry 2021., 5(1), 46-46.
22. Kayıran, H.F. (2019). Thermal Stress Analysis of Discs Exposed to Parabolic Increasing Temperature Distribution. ICAII4.0 - International Conference on Artificial Intelligence towards Industry, 1(1), 260-270.
23. Kayıran, H. F. (2020). Investigation of Thermal Stress Behavior of Discs of Different Diameters with Aluminum Inner (AL2024-T3) and Boron Carbide (B4C) Outer. 4.International Mediterranean Symposium, 1(4), 381-398.
24. Kayıran, H. F., & Şahmeran, U. (2022). Development of individualized education system with artificial intelligence fuzzy logic method. *Engineering Applications*, *1*(2), 137-144.
25. Kayıran, H. F. (2020). Artificial Intelligence and the Legal Responsibility of Artificial Intelligence. Turkish Journal of Management and Economics Research,1(1),1-19.
26. Techtarget, (2022). Access address: https://www.techtarget.com/whatis/definition/Confidentiality-integrity-and-availability-CIA. Access date:20.11.2022.
27. Global defense, (2022). Access address: https://www.globalsavunma.com.tr/yapay-zeka-ve-siber-guvenlik.html. Access date:20.11.2022.