2. Guo, F., Luo, H., Shi, Z., Wu, Y., Liu, H., 2021. Substrate salinity: A critical factor regulating the performance of microbial fuel cells, a review. *Science of The Total Environment.*

3. Parkhey, P., Sahu, R., Microfluidic microbial fuel cells: Recent advancements and future prospects. Int. J. Hydrog. *Energy.* 2021. N. 46, P. 3105–3123.

4. Shaikh, R., Rizvi, A., Quraishi, M., Pandit, S., Mathuriya, A.S., Gupta, P.K., Singh, J., Prasad, R., Bioelectricity production using plant-microbial fuel cell: Present state of art. S. Afr. J. Bot. 2020. Available at https://doi.org/10.1016/j.sajb.2020.09.25.

5. Shrirang Maddalwara,1, Kush Kumar Nayak Plant microbial fuel cell: Opportunities, challenges, and prospects. 2021. Available at https://doi.org/10.1016/j.biortech.2021.125772.

6. Strik, Timmers, R.A., Helder, M., Steinbusch, K.J.J., Buisman, C.J.N. Microbial solar cells: Applying photosynthetic and electrochemically active organisms. *Trends in Biotechnology*. 2011. Vol. 29 (1), pp. 41-49.

DEVELOPMENT OF AI AND ML NOWADAYS

DMYTRO TANANAEV, student
ALLA M. KROKHMAL, Associate Professor, PhD in Pedagogy, Language Adviser
National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute»

Artificial Intelligence (AI) and Machine Learning (ML) have experienced significant advancements in recent years. Both technologies have a massive impact on various fields such as healthcare, finance, marketing, and transportation, among others.

AI and ML have come a long way since their inception. In the past, AI was primarily focused on rule-based systems, where rules were manually programmed into the system. These systems were not able to adapt to new data or situations, and their usefulness was limited. However, with the development of ML, AI has become more sophisticated, and its applications have become more widespread.

One of the most significant advancements in AI and ML has been the development of deep learning. Deep learning is a subset of machine learning that involves the use of neural networks with multiple layers. It has been successful in solving many complex problems that were previously impossible to solve with traditional machine learning techniques. Deep learning has been used in image recognition, speech recognition, natural language processing, and many other applications.

Another area where AI and ML have made significant progress is in natural language processing (NLP). NLP is the ability of computers to understand and interpret human language. With the help of NLP, chatbots and virtual assistants have become more sophisticated and can interact with humans in a more natural way. NLP has also been used in sentiment analysis, where computers can analyze large amounts of text data to determine the sentiment of the author.

AI and ML have also been applied in the field of healthcare. They have been used to develop predictive models that can identify patients who are at risk of developing certain diseases. This can help healthcare providers to take proactive

measures to prevent the disease from developing or to detect it at an early stage when it is more treatable. AI and ML have also been used in medical imaging to identify abnormalities in images more accurately.

In the financial industry, AI and ML have been used for fraud detection, risk management, and investment management. By analyzing large amounts of financial data, machines can identify patterns that humans may miss. This can help financial institutions to detect fraud more quickly and accurately, and to manage their risks more effectively.

The development of AI and ML has not been without its challenges. One of the biggest challenges is the ethical and social implications of AI and ML. There are concerns about privacy, bias, and the impact of automation on employment. These are complex issues that will require a multi-disciplinary approach to address.

The advancements in technology, availability of large amounts of data, and increased computational power of machines have enabled machines to solve complex problems that were previously impossible to solve. While there are challenges to overcome, the potential benefits of AI and ML are enormous. They have the potential to transform many industries and improve our lives in countless ways.

References:

1. https://www.techtarget.com/searchenterpriseai/tip/9-top-AI-and-machine-learning-trends;
2. https://www.simplilearn.com/ten-years-of-artificial-intelligence-and-machine-learning-article\;
3. https://webo.digital/blog/artificial-intelligence-and-machine-learning/;
4. https://www.hpe.com/us/en/insights/articles/the-rise-of-artificial-intelligence-and-machine-learning-2108.html.

DEVELOPMENT OF TRANSPORT TECHNOLOGIES IN UKRAINE

NATALIIA YELNIKOVA, student
EVGENIY I.KUSH, Associate Professor, PhD in Engineering, Scientific Adviser
OLENA ANISENKO, Senior Teacher, Language Adviser
O. M. Beketov National University of Urban Economy in Kharkiv
MARTIN HORN, *Language Instructor*
South-Moravian Educational Center (Brno, Czech Republic)

Transportation is an integral part of any economy and is considered a catalyst for economic development. Ukraine, being one of the largest countries in Europe, has always paid special attention to the development of its transportation infrastructure. Over the years, various modes of transportation have been developed and modernized in Ukraine, including rail, road, air, and water transportation. In this paper, we will discuss the development of transport technologies in Ukraine, focusing on the different modes of transportation, their challenges, and future prospects.