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AI-BASED ALGORITHMS AND TECHNOLOGIES

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Annotation. The topic of AI technologies is extremely popular nowadays. We hear different kinds of news about AI-related innovations almost every day, but how useful or dangerous is it truly? This paper considers some statistics about society's attitudes towards AI and provides interesting information about some of the new AI technologies and algorithms.

Key words: artificial intelligence, technologies, algorithms, statistics.

Introduction. According to UBS statistics [1] that is presented in Figure 1, AI revenues has grown up more than in two times. This means that the pace of development of this industry is very high and, in the future, they will be even higher. In the next four years, AI's industry growth is expected to explode and its impact on humanity will gradually increase too. Some experts even anticipate the beginning of true autonomy of AI-powered machines and software. They are believed to be unleashed from human supervision and become a new non-biological species. But this will happen much later in the distant future and this paper is concentrated on how this new technology is changing the world we used to know.

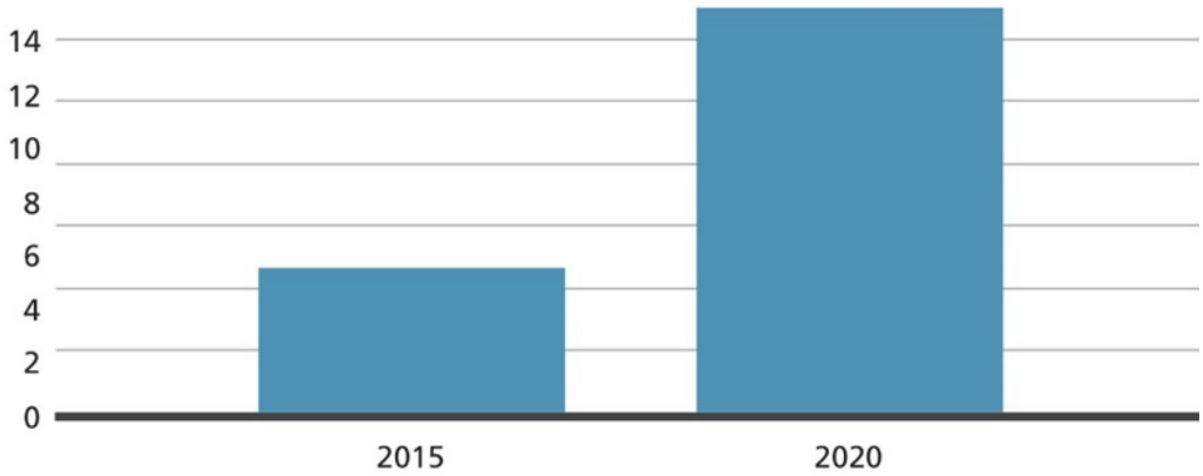

Figure 1 – AI revenues growth from 2015 to 2020

Main part. Especially for this paper, research was done to find out how much people know about artificial intelligence and what is their opinion about its impact on today's world: is it rather positive or not. The research was done mostly among students of the Belarusian State University of Informatics and Radioelectronics, this way we expect knowledge of the respondents to be much deeper than the average one. The important fact is that one hundred forty-two people took part in the survey, so the statistics should be pretty reliable.

Although most of the respondents were so-called "techies", most of them (approximately 37%) associate AI with AI chatbots, probably this is connected with a fact that it was one of the most popular topic of conversations in the social media for the last year. It is also quite interesting, that the respondents are more likely to positively perceive the development of AI. Many of them claimed that it would be able to free humanity from routine, dangerous or hard work and expand the scope of creativity, make art accessible to everyone, not only in observing, but also in production. There were also controversial answers, here is a very deep and detailed example: «The development of AI brings both benefit and harm to humanity. AI simplifies and improves life and will continue to do this. However, the ability of AI to do what a person can do can lead to the fact that humanity

will start to degrade. We will always know that this or that problem, task (especially analytical) can be solved for him by someone, which, again, will lead and leads to degradation. AI, as I understand it, is used in security systems, which, again, is good. However, certain technologies, of course, can be both useful to a person and go against him. It will be disappointing when AI surpasses the humanity when it will no longer need it. So my attitude is neutral. I'm both for and against». The results of the survey are shown in Figure 2.

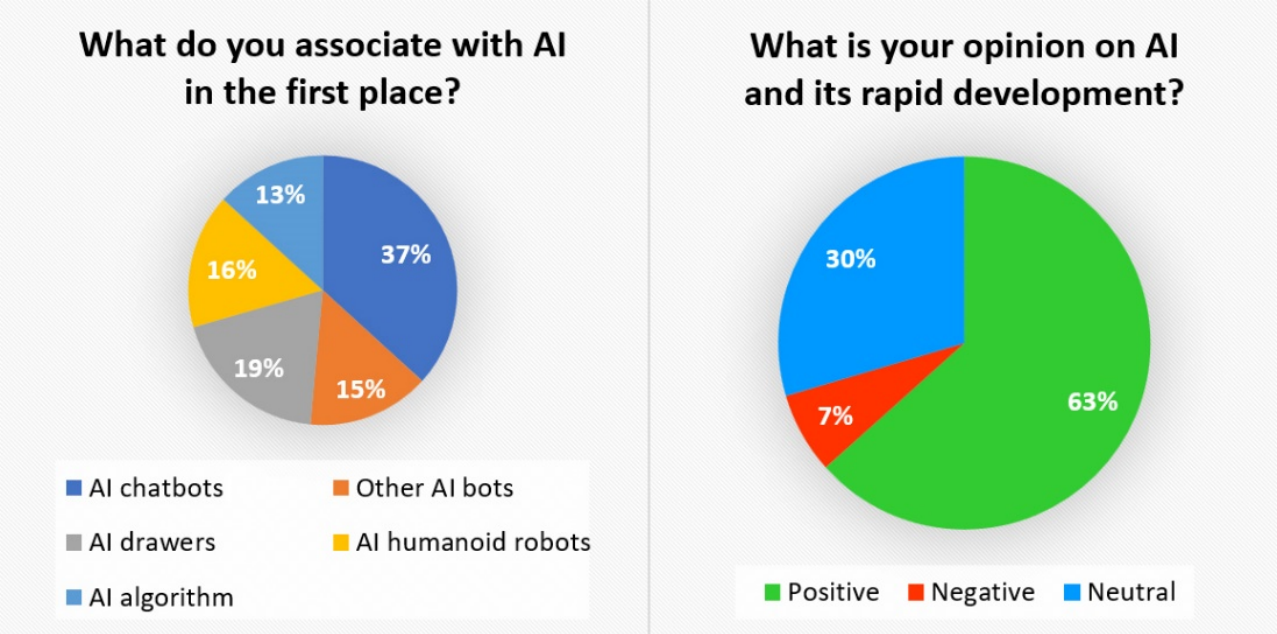

Figure 2 – Response statistics

The second part of the paper is related to AI-based algorithms. Returning to the first question, the least popular association with the term “AI” was AI algorithms. It’s really unfair, because this theme is truly interesting. Algorithms based on artificial intelligence open up a lot of opportunities for us, and perhaps soon your knowledge in this area will expand significantly.

AI technologies and algorithms are closely interconnected with computer hardware, which means that it is almost impossible to develop the former without developing the latter. Because of this fact, most of the advanced AI technologies are provided and sponsored by Nvidia, the largest manufacturer of GPUs (graphical processing units). They even have a separate GPU line named RTX with special Tensor Cores that enable mixed-precision computing, dynamically adapting calculations to accelerate throughput while preserving accuracy, which allows AI algorithms to work much better [3].

The paper will not deeply analyze the technological component, since it includes complex computational methods and requires extensive knowledge in the field of big data to understand, so the main topic is its practical use and interesting facts.

The first technology to be discussed is Nvidia GeForce RTX, which is really useful nowadays. According to Wikipedia [2], Nvidia GeForce RTX (Ray Tracing Texel extreme) is a professional visual computing platform created by Nvidia, primarily used for designing complex large-scale models in architecture and product design, scientific visualization, energy exploration, games, and film and video production. It enables real-time ray tracing, a technique for modeling realistic light transport, which can be observed in Figure 3. It improves image quality a lot and makes the process of 3D-modeling much easier and, which is more important, much faster. The most common use of this technology is submitted in Game Dev Industry.

Figure 3 – RTX technology in Minecraft [5]

The next rather interesting technology is Nvidia RTX Voice [4]. This is a new plug-in that uses Nvidia RTX GPUs and their AI capabilities to remove distracting background noise from your broadcasts, voice chats, and remote video conferences. This allows users to "go live" or join a meeting without worrying about unwanted sounds such as loud keyboard typing or other ambient noises in noisy environments. RTX Voice also suppresses background noise from players in noisy environments, making incoming audio easier to understand.

It's important to note that the Nvidia RTX Voice technology is actually part of the Nvidia Broadcast "kit" [4], which also includes some other technologies such as Virtual Background, Auto Frame, Video Noise Removal and Eye Contact. But what do they do? Virtual Background provides you with features such as *Background Removal*, *Replacement* and *Blur,* allows you to customize the background without the need for expensive equipment or complex lighting setups. Auto Frame dynamically tracks your movements in real-time, automatically cropping and zooming, so your face remains in the center of the frame — even as you move around. Video Noise Removal is not as interesting as the rest, but probably the most universal and without any doubts very useful. It simply enhances the quality of your webcam, removing the visual noise that is present in low light situations for a cleaner picture. And the last, but definitely not the least, Eye Contact. It is hard to believe, but it uses AI to make it appear as if you're looking directly at the camera, even when glancing to the side or taking notes. All these technologies, as the name of the kit says, are designed to simplify the streaming process, but it is possible that in the future all of them will be built into the basic camera application and will be available for everyone.

Conclusion. Concluding all the information given above, AI technologies are already so advanced, that they make some processes many times faster, but this is only the beginning, as this field of technology is developing at an incredible rate. In the near future we will probably be able to do some things we cannot even think about now in seconds. But is it safe for humanity? Will we degrade by giving this huge chunk of work to robots and automatic AI algorithms, or apply our mind to more complex or creative things and open up new areas of knowledge? These are some really difficult questions we need to think out as soon as possible. There were only given examples of not so dangerous applications of AI, but it is much more complicated nowadays, considering the fact that AI is becoming more and more close to human mind.

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