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Robots versus Artificial Intelligence

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What's the difference between robotics and artificial intelligence (AI)? First of all, robotics and AI serve very different purposes. However, folks often get them mixed up. A lot of people wonder if robotics is a subset of AI or if they are the same thing.

The first point to clarify is that robotics and AI are absolutely different things. In fact, the two fields of study are almost entirely separated. If we represent a Venn diagram of these two aspects, it will be like this:
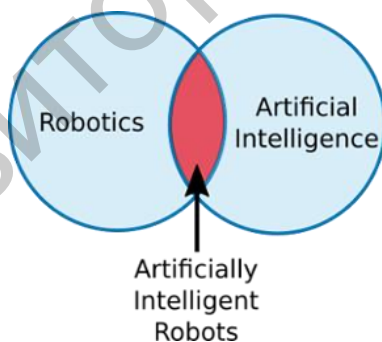

Fig 1. Venn diagram

We guess that people sometimes confuse these two concepts because of the overlap between them, namely Artificially Intelligent Robots. To understand how these three

terms relate to each other, let's examine each of them individually.

Robotics is a branch of engineering and science which deals with the design, construction, operation and use of robots. The latter are programmable machines which are usually able to carry out a series of actions autonomously, or semi-autonomously.

AI is a branch of computer science that involves developing computer programs to complete tasks which would otherwise require human intelligence. Colloquially, the term *artificial intelligence* is applied when a machine mimics *cognitive* functions that humans associate with other human minds, such as *learning* and *problem solving*. Roboticists are nowhere near achieving this level of AI, but they have made a lot of progress with more limited AI.

Computers can already solve problems in limited realms. First, the AI robot or computer gathers facts about a situation through sensors or human input. The computer compares this information to stored data and decides what the information signifies. The computer runs through various possible actions and predicts which action will be most successful based on the collected information.

The real challenge of AI is to understand how natural intelligence works. We do know that the brain contains billions of neurons, and that we think and learn by establishing electrical connections between different neurons. But we don't know exactly how all of these connections add up to higher reasoning, or even low-level operations. In any case, robots will certainly play a larger role in our daily lives in the future. In the coming decades, robots will gradually move out of the industrial and scientific worlds and into daily life, in the same way that computers spread to the home in the 1980s.

According to The Verge 2017 tech report card, AI boomed this year like few other areas in tech, but despite the

scientific breakthroughs, glut of funding, and new products rolling out to consumers, the field has problems that can't be ignored [1]. Some of these, like company-driven hype and sensationalist headlines, need better communication from the media and experts. Others challenges are more nuanced and will take longer to address, such as bias in algorithms and the growing threat of tech firms becoming AI monopolies as they hoover up data and talent.

Where robots seem to be most powerful is as threat to the workplace – and not just manual labor, but white collar professions, like those in the legal and insurance industries. The past year has seen new studies confirming that robots do indeed destroy jobs, and they are likely to increase inequality.

The greater threat, say some experts, is not *un*employment, but *bad* employment, as automation creates a small number of high-skilled, high-paying jobs, but pushes others into low-paid and precarious work that only looks peachy in labor statistics [2].
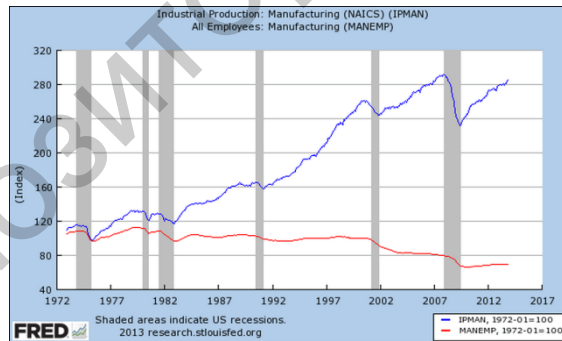

Fig 2. Illustration of productivity to employment

Another question of whether robots can be humans also misses a crucial point. It's not about whether AI can help robots become human beings. Robots should not

pretend to be humans at all. AI can help people solve human problems without assuming a sentient role in society. People building AI can help fellow folks by focusing on problem solving and enhancing productivity. It's significantly more important for technologists to communicate the benefits of the AI technology itself, rather than focus on examples of robots that do not solve real issues. Using AI and robots to sensationalize the human experience and scaremonger society into believing a robot takeover is an inevitable future makes life harder for everyone [2]. For consumers, it prevents people from truly embracing the increasingly personalized benefits AI can offer to their daily lives. For technologists who work on AI every day, the practice of demonizing and aggrandizing AI advancement severely impedes actual innovation and technical progress.

Engineers need to ensure that the AI they create has the ability to learn, discern bias, and avoid making the same mistakes prior to replacing traditionally human-held positions in the workforce and in society, in general. Ultimately, society's responsibility is not to make AI more human-like, but to make AI that significantly improves human lives.

References:

1. The Verge 2017 tech report card: Artificial intelligence and robotics [Electronic resource]. − Mode of access: https://www.theverge.com/2017/12/30/16832164/2017-tech-recap-ai-robots-machine-learning. − Date of access: 22.01.18.
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