INTERACTION BETWEEN TYPES OF ARTIFICIAL INTELLIGENCE

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Abstract: Artificial intelligence is called any entity that has the ability to calculate, perceive their own environment and respond to various actions to achieve their goals. AI is a series of algorithms for developing machines with capabilities close to those of a human being.

Keywords: *Artificial intelligence, intelligent machines, computer science; types of Artificial Intelligence*

1. INTRODUCTION

Although the community believes that artificial intelligence is typical and only for science fiction, the term "artificial intelligence" was first coined in 1956 by John McCarthy, Claude Shannon and Marvin Minsky.[3]

Artificial intelligence(AI) is approaching computer science, which creates intelligent machines that can react and function like humans.

The machine for following the determination of commands in a linear way uses written instructions from algorithms. Every computer system is based on such algorithms and responds to certain commands and data.

Nowadays, artificial intelligence software analyzes and generates data-based solutions that are too complex to process.

AI mainly works to study how the human brain thinks and functions, how people make decisions and solve problems. The results of all research are created by the development of intelligent software and systems.Supporting the development of artificial intelligence is related to learning, thinking, problem solving.

The three forms of artificial intelligence are:

- Artificial Narrow Intelligence(ANI);
- Artificial General Intelligence(AGI);
- Artificial Super Intelligence(ASI);

We are currently in the stage of development from the ANI and at the beginning of the AGI.

For the last form it will take many generations until we enter it.

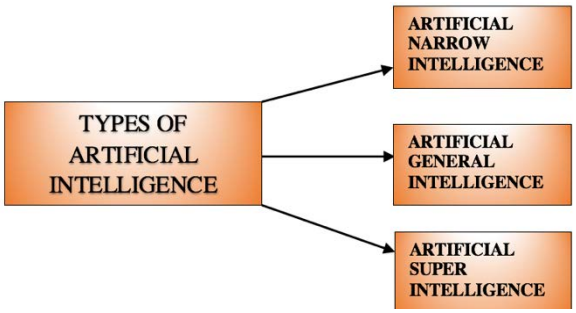

FIG. 1 Types of artificial intelligence

2. ARTIFICIAL NARROW INTELLIGENCE (ANI)

Artificial narrow intelligence (ANI) systems are close to human capabilities. Technology allows systems to replicate even surpass human capabilities. They do only what they are programmed to surpass human capabilities in terms of assigned tasks.Their range of activity is very narrow.

Model recognition, data collection, machine learning and autonomous solutions can be perceived as ANI.

An example of such a system is Siri's assistant by Apple. Siri is a software intelligent agent that is an autonomous object that perceives the environment with the help of sensors and actuators to fulfill certain goals.

Siri records our voice in the form of sound waves and produces them in code. The code is scattered by identifying a phrase and certain words.

After the code, the data is entered as an algorithm that spreads a large number of combining sentences to form the meaning of a phrase.

For the transformation of the sound model of our voice at any moment there is a distribution of probabilities on the sounds of speech.

[1] All this to happen detector Siri uses a Deep Neural Network (DNN). It uses temporary integration to make sure the phrase we said is "Hey Siri"

The digital assistant makes complete and multiple sentences depending on the type of sentence or the given command. DNN is mainly matrix multiplications and logistic nonlinearities. Hidden and the layers are connected. The top layer performs temporary integration, while the actual neural network is indicated by the dashed box.

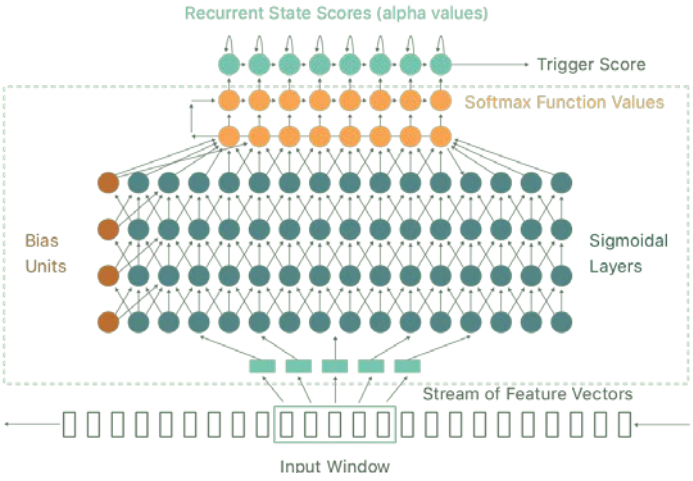

FIG. 2 The deep neural network used to detect “hey siri”

The top layer of Fig. 2 shows that one result is created for all frames. An accumulation of values with a sequence over time is obtained.[1]

$$\mathbf{F}_{i,t} = max\{s_i + \mathbf{F}_{i,t-1}, m_{i-1} + \mathbf{F}_{i-1,t-1}\} + q_{i,t} \quad (1)$$

In each device of repetitive networks there is an operation "(1)", which is:
Where in the equation:

$F_{i,t}$ - This is a result of the state *i* when it accumulates;

$q_{i,t}$ - is the output of the acoustic model;

s_i - is a cost associated with staying in state *I;*

m_i - is a cost for moving on from state *I;* (2)

This Fig. 3 shows how a detector works with the help of the smallest neural network.

At the bottom is the spectrogram of the waveform from the microphone. The bright colors are when someone says "Hey Siri". And the pattern of the sentence is between the blue lines that are vertical.[1]

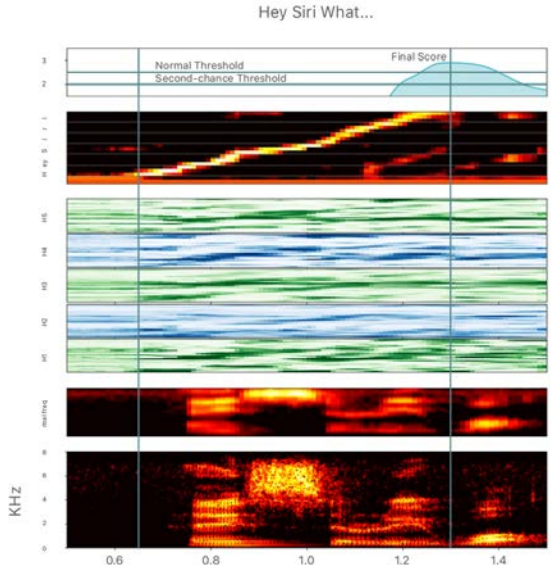

FIG. 3 Sound model that passes through the detector

Another type of narrow artificial intelligence Fig. 4 is used at home, in the office where it is necessary to monitor objects.

The team led by Dina Katabi from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) created the project "RF-Pose".[2]

With the help of AI wireless devices sense the movement and posture of people on the other side of the wall.The team uses a neural network to analyze radio signals that rise from people's bodies. Radio signals create dynamic shapes that walk, sit and move.

ANI can use the antennas of the router at home to detect signals that bounce off our body and thus monitor the movement in the room without the need for a camera.

Wireless signals can also catch a certain person who is in a crowd of people. They are also good for searching and rescuing people. For recognizing certain objects.

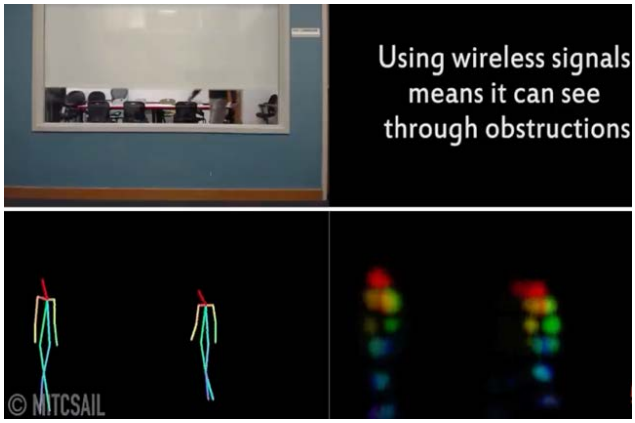

FIG. 4 Artificial intelligence senses people through walls

3. ARTIFICIAL GENERAL INTELLIGENCE (AGI)

This form of artificial intelligence will allow systems to understand, learn and act in the environment just like the human mind.

Their ability is that it will not differ from the human intellect, it will even surpass it. Their knowledge, cognitive abilities, their processing on the data will be of incomparable volume and capacity.

It will be a long time before this kind of intellect is fully understood and fully created, because we still do not know what we need to know about the human mind.

Some of the criteria describe it with:

- Imagination;
- Training;
- Planning;
- Autonomy;
- Skills to achieve goal;

Elon Musk's Neuralink company has created an implant Fig. 5 that, through a person's brain can connect to a computer.

The chip has not yet been tested on humans.

They recently implanted a chip in a pig and a monkey. In pig, the chip in his brain reads and transmits signals to an external computer.

While in the monkey 1024 electrodes were implanted, which cover the areas of brain with which the monkey makes decisions and motor functions of the hands[4].

The manual controller placed in front of it, with which the monkey plays, allows to study the algorithms for nerve signals.

When the controller was removed, the computer itself recognized the monkey’s brain signals without moving hands.

The same technology can be used for smartphones that will be controlled only by thought.

These chips would be useful for people with disabilities to work freely with technology.

The new implant literally inserts the computer into our brain through USB-C.

The operation is performed without blood by a robot, while the person remains conscious during the procedure.

The implant consists of 96 sutures with a thickness of 4 between 6 micrometers Fig. 6. This is 50 times thinner than human hair. They are covered with 3072 electrodes that

stimulate the sensory and motor parts of the brain. The Information will flow to and from the brain, in other words in both directions.[7]

Through the chip in our brain we will be able to become like a toy for the remote. Or we can become a remote for some technological toys. Or we can become a remote for some technological toys around us that we will control only with our mind.

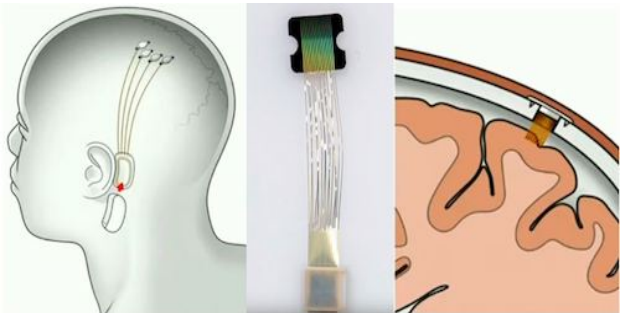

FIG. 5 Elon musk's neuralink implant

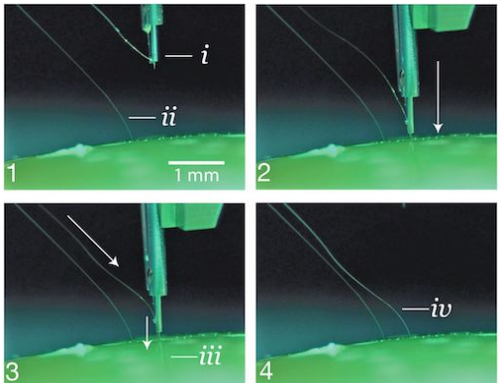

FIG. 6 Implantation of the sutures with the robot

The positive side of chipping is that in 10 years such implants will become something completely normal. With them we will not need the phone, because everything will be done directly under our skull. We will have access to all our clouds and files, as well as enter into super live video connections that will be controlled only by thoughts. With just one command we will be able to control our feelings. From sad-happy or from shy-bolder. In general, we will have control not only over technology, but over ourselves.

Technology will be in harmony with people, because we will improve each other.

It is too early to say whether it is quite frightening or motivating that we will become superhumans.

For now, implants are used for identification, door opening and public transport.

Over time, they can be used to monitor and govern nations. Then one will no longer be able to hide one's intentions. With the help of artificial intelligence, one will be able to obtain and analyze chip data from millions of people.

Some of the companies are preparing another type of similar technology. These are new generation sensors that will monitor everything around us. They will wirelessly send data for storage in huge servers.

FIG. 7 Stickers sensor

They are ultra-thin stickers that can be attached to everything around us.

One such sticker is capable of:

- The sticker can make a simple fork as smart as counting the number of bites we have eaten or how many times have we spun the spaghetti around it.
- What is the temperature around us
- Does a certain person take their pills if the sticker is attached to the blister.
- How much we sweat while wearing a certain type of clothing.

Every movement, step, breath, heartbeat will be detected by a smart sensor that will send data with a 5G antenna directly to an endless server and all this will happen in real time.

In summary, we will have statistics on everything around us.[6]

4. ARTIFICIAL SUPER INTELLIGENCE (ASI)

ASI will surpass human intelligence in all parameters - from creativity to wisdom and problem solving.

Superintelligence will be realized thanks to the unity between man and computer intelligence.He will be the kind of intelligence we haven't seen among the brightest human geniuses. This will be the most intelligent system on our planet.

ASI will not only perform tasks, they will be more capable than a person who may have emotions and relationships.

They will learn everything with unimaginable speed that will help them imitate the way people think and behave.

This technology is too reasonable and great for humanity to say precise and clear definitions. It will be something without which we will not be able to think.

Generations will not need to learn and write new languages, as computers will monitor and record everything they need.

We will also lose a lot of human jobs, as they will be occupied by robots. The physical form of work will be a choice of man or it will be something unknown.

We, as intelligent beings, are essentially adapting the whole world so that it is convenient for us according to the means at our disposal, otherwise we are far from productive as a design.

The humanoid form of a robot is extremely unproductive, for example the vacuum cleaner, the dishwasher. They are not humanoids to pull the machine for themselves or to give them dishes to wash. And their design is made especially in this form what they are created.

In years to come, when the level of artificial intelligence will have exceeded the human brain, we humans will have to be enslaved to machines or be dead.

5. CONCLUSION

With the development of all three forms of artificial intelligence, we humans will lose sovereignty through more and more AI rights. We will be able to be productive only with their help.

AI will monitor our emotional state, choose the right company for us, select our clothing, music, food.

The interaction of the three types of artificial intelligence is that in each subsequent type of intelligence is improved.

Artificial Narrow Intelligence (ANI) has the least complexity compared to the other two types. By using sophisticated algorithms (such as Siri speech recognition) it simulates human behavior without replicating it.

In Artificial General Intelligence(AGI), upgrading is higher because it not only simulates human behavior, but has the ability to solve problems in any area that resemble the human brain.The most extreme state of artificial intelligence is Artificial Super Intelligence(ASI), in which machines surpass human intelligence in tasks in any form, practical or mental.We are still at an early stage of our improvement, but we can give ourselves an idea of how far this can go.

6. AKNOWLEDGMENT

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