Humans Versus AI, Will They Ever Equal?

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When many people around the world think AI, they think up situations such as robot takeover, or rise of the machines. But one contrasting opinion led by a researcher at MIT, Dr. Kate Darling (2022), suggests that computers will never be able to think on the same level of humans, but more accustomed to less developed animals. Her article suggests that the patterns modern AI can notice are not, and will never be up to par with human thinking. Towards the end of her writing, she concludes that robots will not be able to think independently, and their useful functions are supplemental to human use. Through my research, it is in my belief that while AI can represent more simplistic thinking, it is not completely true that computers cannot think like humans. Human thinking is very complex, and technology has barely gotten to the point of trying to replicate basic motor functions with responses to social, and physical situations. But some leading progress can make us safely say that AI will get to the point of humans, and intelligent computers can finally rise.

When understanding how scientists want robots to think, it is important to know how humans think. A website for John Hopkins Medicine (N.D.) describes the brain as the head of the central nervous system. It connects with the spine, and through the spine controls the body with motor functions led by thought. How do brains create thoughts and learn? A recent study by The University of Montreal (2022) states, “The brain is made up of billions of neurons that communicate with each other by forming trillions of synapses.” What this basically means is that through every learning experience we go through, somewhere in our brain, chemical electric connections (synapses) are made, communicating what you learned, and forming a neural circuit. This mostly happens in the neocortex (The University of Montreal 2022). While you might be thinking that these trillions of synapses would require a hefty amount of power, radiation medicine professor Timothy Jorgenson (2022) suggests that our brains continuously work on 12

watts of power. For comparison, modern computers, and power supplies run on upwards of 175 watts. This makes it difficult in understanding artificial intelligence, as scientists need massive amounts of energy for trying to simulate a fraction of the brain's power. Just like Dr. Kate Darling suggests, computers have a lot of potential to live up to for the replication of human thinking. We just are not there yet.

Now that we have a basic understanding of how the brain learns, let us look at a couple of examples where simulated neural networks come into play. As the editor of Science ABC Ashish (2022) understands it, Siri uses natural language processing with a neural network to give very lifelike conversations. What happens is, when you talk to Siri, it captures your voice, interprets it, and sends it to Apple's server, which stores Siri's Deep Neurological Network, to give a response. Apple's simulated neural network is very small in the amount of processing power compared to the brain. Yet, this network requires so much power it cannot be stored on an iPhone. These functions can create acceptable and useful social responses according to its situation. This puts AI in a very good place in terms of human thinking, since social life plays into many of our everyday scenarios.

We covered social scenarios, but what about physical ability? The best example in robotics today would be Atlas. Atlas is a robot designed by Boston Dynamics to be able to use motor controls and physical ability as well as a human. There are multiple videos of Atlas running through parkour courses and doing backflips. To paraphrase software engineer Ben Dickson (2021), Instead of a neurological network, everything Atlas does and perceives through sensors is stored in memory. Atlas determines through motion libraries the best action to take through its environment. Basically, it has several actions already learned, and uses those actions to traverse what it sees through its sensors. In a way, this replicates what we know as muscle

memory. We do not really think about walking or how to jump because we just know how to do it, while also learning when to use it. While this sort of way of programming movement into a robot does not accurately represent thinking with the brain, it is a great way of programming natural movement through instinct and learned experiences. Just like how acrobats can fail running through a movement course, Atlas fails too. Atlas makes mistakes and tries again. Atlas learns like a human.

How do we tie in movement with neural networks? In one source from scientist Fiona MacDonald (2017), an experiment was able to replicate the brain of a worm, and have it use a Lego robot body to move around and react with its environment. MacDonald (2017) states, “So, in 2014, a collective called the OpenWorm project mapped all the connections between the worm 302 neurons and managed to simulate them all in software, as Marissa Fessenden reports for the Smithsonian.” This counts as amazing progress towards simulating human brains. While the difference between simulating billions of neurons to 302 neurons is significant, this project represents the greater possibilities that this technology can yield. This can be seen as the start of animal like deep thinking, and contrasts Dr. Darlings (2022) thesis which infers that robots will never think like humans. Another example of a more advanced simulated neural network is the robot dubbed Sophia by Hanson Robotics. Hanson Robotics (N.D.) suggests on their website that Sophia can use facial, and language recognition processing combined with its neural network to come up with appropriate social responses. Sophia can also utilize motor control and is the first recognized robot citizen of the United States. While not a simulated human brain, and only a fraction of the processing power, Sophia is also a great example of the advancement that lies ahead in the Artificial Intelligence industry.

In conclusion, Darling's (2022) suggestion that the limits of AI end at the simplistic thinking of animals is not true. While artificial intelligence has not reached a level of sophistication akin to humans, it isn't completely impossible to achieve this level of thinking. With studies of movement, and social interaction through artificial instinct and neurons, computers have shown much competence in day-to-day communications with humans. Whether it be Siri, or Alexa greeting you when you get home, a bipedal robot backflipping off of a burning building, or maybe even something as small as a worm moving around with Legos, the greater possibilities these experiments spark up represents a better understanding of brains in general. Robots are slowly gaining the ability to copy human intelligence, and even develop its own through experiences humans could not fathom. While robots can have human thinking, the question of morals always comes up. If robots can develop a consciousness, should they be our servants? Should they be considered another race? Can they be allowed to hurt humans? These questions need to be taken into careful consideration when developing personable robots with free thought.

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