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Future Artificial Intelligence Benefitting Society Through Education: The AI Instructor

If you look up international education rankings, you will find that the U.S. scores lower than the top twenty. Many have received first-hand experience through the byproduct of the educational system: unsatisfactory educators that should not be responsible for edifying the young minds of tomorrow. Those who attend may feel a lack of knowledge in certain subjects and, thus, are not receiving an adequate amount of information to excel within and beyond high school. Attending school should be a gratifying experience where everyone has an implicit, ideal way of learning, instead of an institution that punishes students who were unable to follow one particular teaching method. This educational issue could be resolved through artificial intelligence (AI). By empowering the classroom with an AI instructor, students could be liberated from the fear of error and disappointment, radically changing the US educational system where students are more driven than ever to learn.

Imagine, it is the year 2019, but not our 2019. The Cold War never ended, the US and Russia remain superpowers in dispute. The drive for technological advancements created by the Cold War's urgency to gain the upperhand has led to discoveries and breakthroughs not seen yet in our time. We have dabbled with nuclear technology in the past, but it proved too destructive, and was less of a threat to the enemy as it was a threat to the entire planet. The beginnings of Artificial Intelligence technology was first conceived at a Dartmouth College conference in 1956, similarly to our time, and have come a long way from analyzing and learning checker strategies.¹ These technologies, however, were quickly recognized for their ability to perform dangerous tasks without putting human lives in danger. Breakthroughs in AI technology were abundant in the years after its initial development, soon being able to receive combat commands while simultaneously taking in information and reacting to its environment on the battlefield. As both countries advanced their models of robotic intelligence, the focus for combat technology has been diverted elsewhere to more covert and stealth infiltration based tactics. Espionage was now a much more viable option for intelligence gathering without human lives at risk. Improvements were made in communication and speech for robot models as AI technology approached closer and closer to our idea of Artificial General Intelligence, or AGI, the combination of AI in any small elements to simulate the larger general human experience.

¹ Crevier 1993, pp. 47–49, Russell & Norvig 2003, p. 17

Androids now exist as fully aware machines with the ability to receive commands and also adapt to unforeseen circumstances, and advancements have been made in organic technology to help these androids cross the concept of the uncanny valley. Now, with the combination of artificially intelligent robot androids that are almost indistinguishable from humans, and the Cold War still pushing both countries' drive to get a leg up in the technological race, education of the youth became a top priority. The decision has been made to place androids in teaching environments in order to learn each individual students' needs and preferred method of instruction, greatly increasing the youth's interest in education and contributions to society outside of academia. This is a scenario in which AI instructors would be beneficial to society.

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These AI instructors will be able to provide the best and most efficient education possible and potentially replace current human instructors in grades K-12. Each student will be assigned a personalized AI instructor so that each AI can adapt its learning style to best suit each student's unique needs. The AI instructor is able to adapt on a daily basis, and has the ability to store and link information together to build a greater connection with its student. It works with advanced technology to present the student with the information in different forms for each lesson, whether it be projections, images, and/or text. This allows for a more personal experience than our education system's current classroom settings where the instructor has his or her attention divided and has only one way of teaching based off their own experience. The AI Instructor will be everyone's best teacher.

At a first glance, these AI instructors don't appear any different between them and normal people. Both are human in shape with similar heights, pairs of eyes, limbs, a nose, a mouth, and just anything that one may associate with for a human. However, these AI instructors do have some key differences. The most upfront difference is its skin. It does appear paler in comparison to that of a human and it also consist of a special pressurized polymer engineered to resist long-term wear and tear. Along its arms, panel lining can be seen throughout where they can fold out thin robotic arms that can extend twice the length of its arms to be able to reach areas that may be too high, narrow, or otherwise difficult to reach with normal human limbs. On its hand feature holographic projectors on the tips of their fingers (a projector for each finger for a total of eleven) to be able project multiple holographic imagery to either complement them together as a whole or to project separate visuals that will assist individual students. The eyes also have a distinct characteristic of faintly illuminating around the pupils as well as the addition feature of seeing in a full visual spectrum to visually identify effects on the students unseen by humans such as as body temperature and health. These AI instructors also have the ability to communicate with its students outside of physical contact or campus by connecting to the students' mobile devices to assist students academically. This would allow the AI instructor to remain close by and be able to monitor their students and provide relevant information to

continue educating them. The functions and technologies of the AI instructor create an immersive way of learning that improves engagement with students thanks to its adaptive learning capabilities.

Because so much technological advancement has come after the Cold War, the possibilities of the AI are close to infinite now. And we are in the presence of something grand: An android with the capabilities of detecting and projecting human emotion and intellect.

So many advancements have propelled our technologies. In the year 1989, Theodore A. Bordeaux, invented a speech recognition system which works with the phonemes in our speech to detect and translate it into language by machine or AI.² It had pushed speech recognition software to understand natural and real time conversation. In the year 2006, Nicu Sebea and his fellow researchers published an article that stated that the awareness of emotion would be something that would push the potential of AI³. AI could become human. They were able to start with Real Time Facial Expression Recognition System, which focused on recognizing real-time expressions that happen more naturally and diversely compared to the system facial action coding system (FACS) that Paul Ekman and his partner had created to detect Universal Expressions based off of image detection. They were definitely onto something much more real. This initial research topics were stepping stones that would cause an avalanche of engineers, scientists, and researchers to fully invest in AI. Multitudes of collaborative research had allowed the US to replicate the left and right hemispheres of our brain into an AI system. The AI is now able to directly interact with a human as if it were one itself.

We are taking advantage of this finished research that was solely pursued for the military and inserting it into the educational field as an AI Instructor. The difference between the human instructor and the AI instructor would be its limitless memory, its collection of information instantly, and its ability to adapt seamlessly to every student possible without skipping a beat(if it had a heartbeat). It would be so advanced that the student would not be able to tell that it was not interacting with a human.

The algorithms of AI Instructor are designed to make decisions using real-time data collected from sensors, digital data, and inputs as well as using information already learned in the past. Combining and analyzing a variety of information from multiple sources simultaneously, the AI Instructor is capable of making any kind of decisions and holding intelligent conversations on any topic⁴. It is not only far smarter than other technology ever created, but also certainly smarter than all humans put together. This self-aware AI Instructor is able to sense human presence, understand student communications, and respond to their requests. The conscious, intelligent, and personified mind of the AI instructor will blur the line between

² IFI CLAIMS Patent Services, US4852170A - Real Time Computer Speech Recognition System (1989).

³ N. Sebea et al., *Authentic Facial Expression Analysis*, (2006).

⁴ West, Darrell M., and Allen, John R..

the artificial and the natural and become a friend for a student. A friend, who within milliseconds is able to extract data from the vast wealth of information present on the Internet and elsewhere and get the answer to any question raised by a student. A friend, who can find the most up-to-date and expert-written information in any discipline by searching for scholarly articles published in academic journals and electronic library databases all around the world. The AI instructor can prepare students for a digital future by bringing the latest knowledge into the classroom and developing new lesson plans in any field, by finding instructional videos and helping students get the most out of the classroom.

The AI instructor stores all the information gathered in a database and then inserts the resources and activities into a learning environment. The database includes information concerning the student, such as personal data, performance data, and data from student interaction with the Instructor. Every student interaction in the environment is saved in the database in the form of a log. Similarly, the student's performance in each of the activities and tasks is stored in the database and updates constantly during every interaction with the student⁵.

As AI applications accelerate across many sectors, it is vital that we reimagine our educational institutions for a world where AIs will become ubiquitous and where they can cater their approach towards individual student's preferred teaching styles. If our course of history took this path, perhaps the education of all students would be in better hands. It is important to nurture all these ways of learning and to assist students in their field of interests. This kind of future can still be realized if the world simply put more research and development into artificial intelligence. With an AI instructor, the future educational system will become more efficient and productive while maintaining a versatile and enjoyable teaching style that accommodates individual learning in a classroom environment. This way of learning can still be realized.

⁵ Giuffra P, Cecilia E, and Silveira Ricardo A, 53

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