Too Meaningless for Discussion: Revisiting Turing's Fundamental Question Regarding Artificial Intelligence

By James Daniel Schlittenhart

The obvious irony of Alan Turing's assertion that the subject of mechanically produced thought was "too meaningless to warrant discussion"[1] is seen in the fact that the debate surrounding the topic has flourished since Turing first posed his question in 1950. Since then, the concept of artificial intelligence has undergone countless quantitative scientific examinations, seen debate in the philosophical community, and been portrayed on Hollywood's silver screen. The sheer amount of research and interest in this matter attests to the ironic nature of Turing's statement. However, underneath the obvious irony lies a subtle subtext; the true irony of the question regarding whether machines can think lies in the approach Turing takes to determine the answer. Dismissing the question of machine-produced thought as too broad, Turing instead developed a test that requires immense specificity and human-like cognition as a determinant for artificial intelligence. The focus turns from, "can machines think?" to, "can machines think like humans?" This complicates the debate to a point where it no longer addresses the original topic. By returning the discussion to its original, most elemental form, it is possible to present a clear and fundamentally sound argument for the existence of artificial intelligence. The basis of this proposition rests on three key elements. First, the distinction between machinery and sentient beings is clearly defined. Second, the definition of "intelligence" must be applied correctly given the

[1] Alan Turing, *Computing Machinery and Intelligence* (1950)

context of the debate. Last, given the previous two points, a fair and unbiased evaluation must be made of the intellectual capacity of modern machinery.

Before continuing, it is important to substantiate the purpose behind addressing the debate at its most fundamental state. This is not an attempt to conveniently sidestep the intricacies of the argument. Rather, this is a focused technique for problem solving outlined by renowned businessman, author, and founder of the Goldratt Institute, Dr. Eliyahu M. Goldratt. In Goldratt's book *The Goal: A Process of Ongoing Improvement,* the protagonist Alex finally summarizes the main purpose on the last page:

> "We are asking for the most fundamental things, and at the same time we are asking for the world… At the same time, can you imagine what the meaning is to being able to hone in on the core problem even in a very complex environment?"[2]

By breaking down a question to its most basic form, the resulting solutions address the fundamental issue at hand and offer viable, applicable answers. This elemental approach is not undertaken at the expense of validity or careful deliberation; rather, it is a tactic to assist in finding practical solutions. This methodology underlies many of the arguments made henceforth concerning the existence of artificial intelligence.

Drawing a clear line between what is considered a machine and what is considered a sentient being is a crucial starting point in this debate. To construct a fundamental distinction, the context of the subject matter must be analyzed. In Turing's scenario, the machines referred to are computing systems designed and created

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[2] Eliyahu M. Goldratt, *The Goal: A Process of Ongoing Improvement* (North River Press, 3rd Revised Edition, 2004)

through a physical, non-natural process. These machines are created for the purpose of completing a task; in the context of this debate, the task would include some form of data analysis and interpretation. A machine is only capable of performing those tasks which it has been created to perform; in the context of Turing's test, this would mean successfully fooling the judge. As a machine is programmed for a specific purpose, it can be argued that a machine is incapable of intrinsic consciousness; it must be supplied with any form of awareness by its maker and is limited in this aspect by the same. With this classification in place, it is also possible to identify a non-machine using the same criteria. A non-machine is an organism created by natural processes for a self-determined purpose. A non-mechanical organism is able to perform any task it is physically and mentally capable of. Non-mechanic organisms are intrinsically sentient, and are capable of expanding their awareness without prescribed limitation. It is, of course, possible that exceptions to these rules exist, but the aforementioned criteria form a rational set of guidelines to classify machines versus non machines, while at the same time remaining true to the context.

It is important to note that the distinction between machines and humans has at no point been discussed; rather, only the dissimilarity between machine and non-machine. This is intentional and plays a crucial role in refocusing the debate back to the fundamental question, "can machines think?" It is critical at this juncture to establish what standards or criteria must be met in order for anything, machine or organism, to be considered intelligent. Additionally, a reasonable definition of what constitutes intelligence must be contextually derived.

The natural inclination in the debate over the existence of artificial intelligence is to use human cognition as the standard to which all other thought processes are compared. This is highly unfair and skews the entire debate. Consider the following scenario: in order to be promoted from the preschool level to kindergarten, an assessment is given to each student and required to be passed before promotion is conferred. Each student is given a pencil, eraser, three hours, and a copy of the Medical College Admissions Test (MCAT). This would hardly be a plausible assessment of a student's intelligence level, and it would be highly unfair to expect any of them to succeed. This is, in essence, what Turing's test requires. Though it is still debated if machines possess even the capability for intelligence, the assessment deemed an acceptable determinant is one that requires a machine to understand the intricacies of human linguistics, gender roles, and the difference between truth and deception. This is not a test designed to measure intelligence, but an experiment designed to gauge the humanity of the participant. Turing is not alone in this seemingly misplaced search for humanity rather than intelligence. Prominent futurist Ray Kurzweil wrote the following in an article concerning his belief that a computer would pass the Turing test by 2029:

> "The basis of the Turing test is that if the human Turing test judge is competent, then entity human-level intelligence is needed in order to pass the test… As humans jump from one concept and one domain to the next, it is possible to quickly touch upon all human knowledge, on all aspects of human, well, humanness."[3]

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[3] Ray Kerzweiler, *A Wager on the Turing Test: Why I think I Will Win* (April 9th, 2002)

Clearly, the goal of these tests is not to simply discover if a machine can form a rational thought; instead, the goal is to determine if a machine can replicate humanity. While this would indeed be a lofty accomplishment, it neglects the fundamental question at hand, which is simply, “can machines think?” Consider again the scenario involving the preschool students taking the MCAT. If one of the students was able to, by process of actual cognitive reasoning and no luck or guesswork, successfully answer only one of the questions on the test, he or she would be deemed a brilliant intellect. In the same way, artificial intelligence should not be judged by an impossibly high standard. Evidence of even the most basic thought process in a machine would yield a positive answer to the question, “can machines think?” The degree to which the thought process is present should in no way be taken into consideration. Intelligence should instead be considered an exclusive term; it either exists, regardless of measure, or it does not. A machine is either capable of thought, or it is not. With this in mind, it is essential to devise a contextual, fundamental definition of the term “intelligence.”

According to the basics of the Turing test, in order to have even the smallest chance of passing, a participant must possess problem solving skills stemming from an adaptive reasoning ability. Though the degree to which Turing expects to see this displayed is unreasonable, the fundamental idea is still practical. Combined with the idea of this being an exclusive term, a reasonable definition of intelligence is the ability to apply adaptive reasoning to a situation in order to solve a problem, regardless of the complexity. If a machine is able to display this ability, then it can be argued that machines can indeed think.

Does a machine currently exist that meets the aforementioned criteria and can be deemed as intelligent? Though there may be many computers that match these qualifications, perhaps none is more prominent or makes the point better than Deep Blue. Developed by IBM, Deep Blue is a powerful computing unit that specializes in one area: playing chess. Not designed entirely for the purpose of competing in chess, Deep Blue's ability to cycle through vast streams of data and process alternate outcomes and solutions at high speeds make it a prototype for computing systems in the business, financial, and medical fields. The question is, does Deep Blue fit the previously outlined criteria for being an intelligent machine? First, Deep Blue was indeed created for a specific purpose through a physical, non-natural process. It therefore meets the guidelines for being a machine, based on the contextual definition previously developed. Does Deep Blue utilize adaptive reasoning in order to solve a problem, which would constitute intelligence? Consider this information, taken from the IBM website:

> "Although chess has a finite number of possible outcomes that the computer must analyze, there are subtleties that do not easily subject themselves to objective analysis. Material is easy to evaluate, but what happens when a human player offers a gambit? In evaluating whether material gain makes up for a possible loss of positional strength, the computer is no longer comparing apples to apples. Sophisticated programs like Deep Blue must have ways of evaluating gambits, and declining them if necessary."[4]

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[4] IBM Research | Deep Blue Overview, May 11 2011, http://www.research.ibm.com/deepblue/meet/html/d.3.3a.html (Retrieved January 20, 2012)

Deep Blue must be able to do more than just logarithms based on the position of the opponent’s pieces. The program must be able to interpret and adapt to what it believes may be a ploy by an opponent. Deep Blue is required to analyze a situation, adapt, and make a decision to solve a problem. By the definition derived earlier, this constitutes intelligent behavior and thought processes. Here again, the fundamental question must be addressed: is this machine displaying even the smallest amount of intelligence? The answer is yes. Deep Blue may display static thought relating only to the game of chess, but this is still a legitimate thought process. It may only display intellect in a specified area, but it is a display of intelligence nonetheless. Given all the information previously discussed, Deep Blue represents a real-life example of a machine that does indeed possess the capacity to think.

Allen Turing and Ray Kurzweiler had a specific vision in mind regarding artificial intelligence. Though great visionary thinkers, the ideas that they perceived have not yet come to fruition, and possibly may never exist. However, by revisiting the original question in its fundamental form, the argument can be made that machines do indeed possess the capacity for thought. The implications of artificial intelligence, both as envisioned by Turing and Kurzweiler and that outlined in this analysis, are monumental. By revisiting Turing’s original question with modern information, it is easy to see that this is, after all, a quite meaningful discussion.

Bibliography

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