Living Robots?
Nathan Sauder
Nease High School
Very.nsauder@gmail.com

Living Robots?

Preface

Before really getting into the meat of this paper, there are a few things that ought to be clarified. First, the purpose of this paper is not to provide distinct and concrete answers, but rather to provoke thought and provide clarity. It is an exploratory paper intended to ask many more questions than it answers. Second, please note that this paper is neither a complete nor an exhaustive work. I have knowingly left out certain aspects of various topics in order to avoid writing a book, and I am certain that there are many ideas that I have unknowingly missed. An exhaustive discussion on this topic would require volumes.

So, with that being said, what is "this topic?" In a nutshell, this paper is intended to explore the question of whether or not robots could ever be considered living beings. In order to even begin to answer this we first need to decide what life is. Once we have some idea of the complexities of defining life, we can then delve into whether or not a robot can be alive. If a robot were to become sophisticated enough to have many or all of the properties of what we consider to be living beings, would we then have the same moral obligations to it as to, say, another human?

What is Life?

The question of what life is or is not has become a hotly debated topic in our society today. Questions such as the ethicality of abortion, cloning, and other such scientific endeavors have been explored by thousands of people ranging from scientists to the U.S. Supreme Court to average people. So what is life really?

Scientists have, over the years, come up with many different definitions for what life means biologically. While there is not one universally accepted definition for life, some of the most commonly included criteria are:

1. The ability to grow or develop
2. The ability to reproduce
3. The ability to evolve
4. The ability to take energy from the surroundings and convert it into usable energy
5. The presence of DNA
6. The ability to respond to stimuli from the surroundings

Most scientists would define life as some composition of these factors (although some people would add an additional criterion or two to these due to the fact that all of these currently

accepted definitions imply that a human fetus is alive). Clearly the robots that we currently have the technology to produce do not meet all of these criteria.

What if, however, something had feelings; emotions; and was given a sense of purpose or morality, but did not match this scientific definition? Would it be considered alive? Should emotions be considered in calling something alive? Plants are considered alive and have no emotions. They also, however, are not considered "creatures." For example, we run over grass with a lawn mower all the time, but if you intentionally ran over a dog with a lawn mower people would be horrified.

So perhaps we would classify a robot with emotions, feelings, etc as a being but not as alive. This begs the question: can something be considered a being without being considered alive?

Alternatively or in addition to emotion, free will may be used to determine whether or not something is to be considered a being. Think about it; one of the most important abilities that makes us different from other non-living objects is the ability to make our own decisions. One could attribute this to mere intelligence, but the ability to reason is different than free will. In a programmed "brain" there is an ability to make decisions, but only by following a pre-created "path." If you input the exact same variable multiple times you will get the exact same decision. In order to determine whether this is even a relevant issue, we first need to decide if humans even have free will? If humans (which are clearly and universally considered living beings) have no free will then it must be a moot point. So, are humans truly able to make decisions or do we also only follow pre-made decision pathways?

One argument is that everything in this world is already pre-determined. When the universe was first created, there was a specific set of circumstances; a specific set of variables. Those variables caused certain phenomena to happen which caused other specific things to happen, etc etc and so on and so forth. All of these outcomes were determined by the laws of the universe (such as the laws of physics) and therefore were the only possible outcomes given the input factors. All of this eventually led to life.

Now, consider that every living creature makes decisions. Those decisions are made based on natural instinct (such as what is coded in your DNA), current circumstances, and past experiences. Thus all decisions that humans make are the result of set input variables. Since the past and the present are determined by what came before them, and your instincts and personality are hard-coded inside of you, every decision that you make is actually determined before you make it. So then, do we even have free will? If we don’t have free will, then in that respect there is no difference between a robotic brain and our own.

Some, however, do not believe this to be the case. Consider the often asked question of why a good God would allow bad things to happen. If God is omnipotent and completely benevolent, then why does He not just eliminate all evil and all pain from the world? The answer to this question is found in the concept of free will. When God created mankind (the argument goes) He loved them. In return, He wanted them to love Him. If God were to control every aspect of the universe, and so keep any bad thing from happening, then humans would not have a chance to love Him and trust Him. Because of this, God allows random things to happen. Alternatively, for

those who do not believe in God but do believe in evolution, think about this in terms of the random processes of evolution. Evolution is generally defined as being a random process. Random genetic mutations lead to advances in the capabilities of a life form. If these genetic mutations are not random, then one must assume that they are guided by something. This spits us out right back at the idea of God again. Either way, we come to the conclusion that random events occur. The concept of randomness breaks the argument that everything is fixed and there is, therefore, no free will.

Could robots ever be alive?

With some idea of what life is and is not under our belt, the next step is to determine whether or not a man made robot ever could or should be considered a living being. Our first concept to ponder is if a robot could ever be made to fit the scientific definition of life. Of the six common criteria for life listed above, only two are clearly possible with current technology. Both the ability to take energy from surroundings and the ability to respond to stimuli from surroundings could be accomplished by even an amateur roboticist. For example, solar panels could be used to take energy from surroundings, and Botball robots use sensors to respond to different types of stimuli from the surroundings. The other four criteria, however, are a bit more complicated.

Let's start with DNA. Scientists currently have no procedure by which to create DNA from scratch, much less use it in a robotic contraption of any sort. They can, however, remove DNA from living organisms. So, if I were to take some DNA out of, say, a carrot and then place it in a robot without any functional purpose would that robot then meet this criterion for life? Clearly that is not the intent of the criterion. So suppose a robot were to be built with living tissue in it. Would this constitute having DNA? It could be argued that the robot would then meet this criterion for life. Some would also argue that it is not having DNA that matters, but rather having some sort of instructions. This would make the criterion read "having a set of built in instructions by which to function" rather than "having DNA." If this is the case, then robots can (and already do) meet this criterion.

The remaining three criteria are largely based on the concept of growth and development. While perhaps research is currently being conducted in the field of learning robots, there is no current robot with the ability to learn or grow to the extent that it would be considered to have met any of these criteria for life. Science fiction, on the other hand, has created many examples of these robots for us. Take Skynet from the Terminator movies as an example. Skynet (unfortunately for John Conner) has the ability to "reproduce" other robots. Over time, it learns from events and is able to create more sophisticated Terminator models. In some sense, then, it can reproduce, grow and develop, and even evolve. If we were to create a robotic entity that could accomplish all of these things, would it then be considered alive?

As discussed above, there is a difference between something being alive and that something being a being. This concept (at least the way I am defining it) stems from the concepts of emotion and free will. Can a robot truly have emotions or free will? The answer is that it depends on how you define these concepts. As the lengthy discussion above indicates, there is a distinct

difference between free will and the ability to make decisions. Depending on how you define, free will, however, robots may or may not be able to be given that ability.

Conclusion

In conclusion, this paper draws no distinct conclusion from any of the above arguments. Many of the ideas presented are abstract enough that you probably read this paper and had completely different thoughts, ideas, or questions than I did. Hopefully this paper has intrigued you and made you think more about the fascinating topic presented in it.

Sources

"Life Definition Clarification." Ask a Scientist. N.p., 29 Jan 2004. Web. 2 Jun 2010.

"Life." Stanford Encyclopedia of Philosophy. Stanford University, 04 Aug 2008. Web. 1 Jun 2010.

Mullen, Leslie. "Defining Life." AstroBiology Magazine 30 Dec 2002: n. pag. Web. 1 Jun 2010.