Chapter 20
Why AI and Robotics are Going Nowhere Fast

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ABSTRACT

Considerable progress is being made in AI and Robotics to produce an android with human-like abilities. The work currently being done in mainstream laboratories cannot, unfortunately, succeed in making a machine that can interact meaningfully with people. This is because that work does not take seriously the fact that an intelligent agent receives most of the information he or she needs to be a productive member of society by accepting other people's assertions. AI and Robotics are not alone in marginalising the study of testimony; this happens in science generally and also in philosophy. After explaining the main reason for this and surveying some of what has been done in AI and philosophy on understanding testimony, by people working outside the mainstream, the author presents a theory of testimony and investigates its implementability.

INTRODUCTION

In Artificial Intelligence (AI) and Robotics, androids are thought of as being machines with human-like abilities. They are seen as being capable of meaningful interaction with people and as being able to do the same sorts of thing that humans do. Some prominent researchers think that the ultimate goal of AI is to manufacture such androids. Although I am sceptical about the possibility of producing a completely undetectable android, whose functionality is identical to that of a human being, I am not entirely negative about what can be achieved. Searle (1984) and Dreyfus (1992) are; they believe that there are irreducibly non-algorithmic human abilities that machines will never have. I have argued elsewhere why it will always be possible to distinguish an android, no matter how sophisticated, from a human being, provided that that android was designed and manufactured by human beings (Diller, 1999). Be that as it may, I can see no reason why androids

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could not be produced in the future that emulate most human abilities to a considerable extent. However, mainstream research currently being undertaken in various laboratories around the world has no chance of producing an android that can associate with human beings in a worthwhile manner and co-operate with them in joint ventures. This is because all of this conventional work overlooks the importance of testimony in everyday belief-acquisition. Humans acquire most of their information by accepting what other people say and what they have written. Acquiring knowledge through testimony is not an optional ability; it is essential to our participation in human society (Dummett, 1993, pp. 423–424). Without the ability to learn by believing other people's assertions, an android could not engage with humans in any sort of productive or meaningful activity.

Note that 'testimony' refers to much more than just eyewitness testimony. It refers to any kind of information received from any source in linguistic form. It can be about anything, including logic, mathematics, history, geography, science, philosophy, metaphysics and even theology. Examples of assertions that most people accept through the testimony of others are: 'The speed of light in a vacuum is 299,792,458 metres per second', 'General Sikorski died on the fourth of July 1943 when his plane crashed into the sea off the coast of Gibralta' and 'There do not exist non-zero natural numbers x, y, z such that $x^n+y^n=z^n$, for $n>2$' (Fermat's Last Theorem).

In this paper, I adduce the main reason why testimony has been marginalised in science and philosophy and show how this has affected research in AI and Robotics. Although the investigation of testimony has been marginalised, it has not been entirely neglected. I survey some of what has been done in philosophy and AI on understanding how we acquire information by accepting other people's assertions. I then present my own theory of testimony; this has several advantages over alternative accounts. I also investigate how aspects of my theory could be implemented and report the results of a small prototype which evaluates information in a restricted domain.

BACKGROUND

Research in AI and Robotics

People working in AI study many different sorts of problem and have various aims. I am interested in those who see the construction of an android with human-like abilities as the main goal of AI. Charniak and McDermott (1985, p. 7) belong to this group: 'The ultimate goal of AI research (which we are very far from achieving) is to build a person, or, more humbly, an animal.' Those working on the MIT Cog Project express themselves as follows: 'Building an android, an autonomous robot with humanoid form and human-like abilities, has been both a recurring theme in science fiction and a "Holy Grail" for the Artificial Intelligence community' (Brooks, Breazeal, Marjanovic, Scassellati and Williamson, 1999, p. 52).

In recent years considerable progress has been made towards achieving this goal. Many research centres around the world are devoting vast resources to try and construct an android; Menzel and D'Aluisio (2000) survey much of this work. Space prevents me from mentioning all the interesting projects being undertaken, but I will present two of the most impressive examples of what is being done.

A number of projects are trying to produce robots that can walk on two legs. Probably, the most successful of these is Honda's ASIMO robot. This looks like a man wearing a space suit. It is able to walk, run, climb stairs and even kick a football. ASIMO is the most recent in a long line of robots manufactured by Honda. Although the original aim of their research was to produce a robot that could walk on two legs, ASIMO has a number of additional abilities. It has been equipped with visual sensors that enable it to recognise