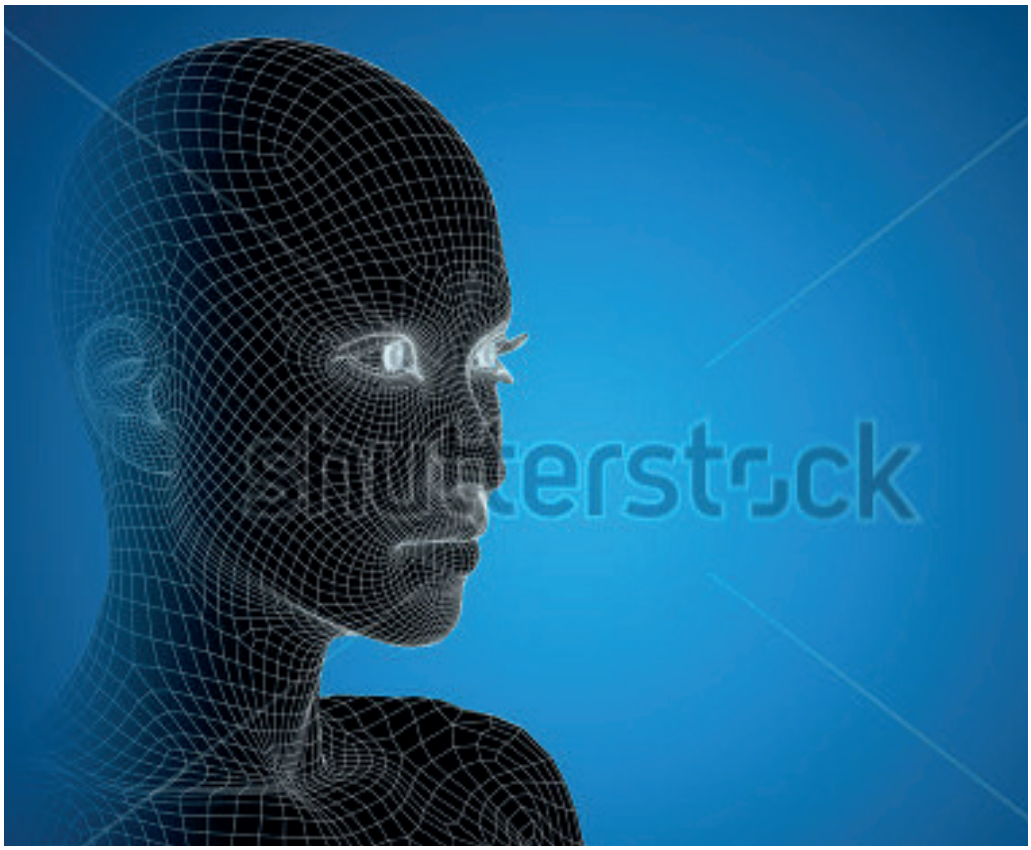
Where do we need new laws?



Q&A with Professor Tony Prescott, Director of the Sheffield Robotics, an interdisciplinary institute across both Universities in Sheffield in the UK

What is the overall state of play at the moment regarding the relationship between ethics and law as regards robotics?

There are many legal issues and serious discussion has only begun within the last decade. Within the research community there has been significant preliminary discussion but law-makers have yet to take a strong interest. Key issues include liability and privacy. Copyright is also an issue. For instance, if a robot creates a work of art who owns it?

There are ethical issues about which there should be legislation. There are others for which there should not be legislation. There is the risk of premature legislation which could restrict the development of robotics, but there is also legislation which will enable the development of robots. For instance, it will be necessary to revise laws in order to allow driverless cars and drones to operate more effectively.

What issues are ethics experts looking at now?

Robot ethics is an increasingly active area. There are different sub-fields.

The most advanced discussions are about the possibility of robots being used as weapons. The Campaign to Stop Killer Robots is working with the UN to try to bring about a moratorium on the use of certain kinds of robot weapons. A key issue is whether robots and autonomous systems should be able to decide for themselves whether to shoot to kill. Although this is an area that has been debated for some time, there isn't a consensus. For instance, there are people who argue that robots are more rational than human beings and ought to be able to make better decisions in some circumstances. They can also make faster decisions in rapidly-changing situations. There is another view that robots will make bad decisions because they lack adequate situational awareness. For some people, robots should never be left to make these decisions; for others it's more a matter of developing better technologies which will take some years. My own view is that we should not allow robots to make life-and-death decisions.

Most other areas are less well developed and there is less of a consensus as to what the questions and answers should be.

There is likely to be increased use of robots in healthcare – for instance, in care of older people and those with disabilities. There are ethical concerns as to whether increased use of robots in care will lead to people having less human-human contact. My view is that this is a possible risk and that we may need to have legislation that guarantees people the right to some social contact with other people if they wish for it.

Another question concerns the relationship between a care robot and the person being cared for. For instance, what about a robot that is designed to remind you to take your medicine? Should it be able to phone your relatives and tell them if you won't take it? That raises control and privacy issues. As soon as a robot has some autonomy then the human who is being cared for is giving up some of their control. Although these issues affect robots, they also come up with other forms of technology. So it's important that we don't lose sight of the wider situation and focus only on robots.

Then there is the issue about the ability of robots to conduct transactions. If you want your robot to buy you a loaf of bread at the shop you wouldn't be able to do so at the moment because a robot can't legally conduct transactions or own property. But what if we change to law to allow a robot to undertake transactions and have ownership of property? Someone might then say "I would like to bequeath all my property to my favourite robot". Let's take this scenario a bit further. Perhaps I could program a robot to have a personality, political views, likes and dislikes just like my own. I might even make it look like me (like the Geminoid robots built by the Japanese scientist Hiroshi Ishiguro). Then, when I make this robot the prime beneficiary of my estate, it could carry on making decisions in the way I might have done after I've gone. It could potentially carry on doing this

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indefinitely.. If I was rich and powerful I could leave my business empire to a robot. It could then be the CEO of a major company. Looking down the line, robots might increasingly own more of the assets in the world and humans less. This sounds very dangerous, so we would need to be very careful about creating laws that allow robots or other AIs to own property.

Then there are robot companions. People are already having relationships with robots. A lot of people give names to their robot vacuum cleaners and they treat them rather like pets. The army has found that there are issues with soldiers giving names to bomb disposal robots – if they become too attached to their robot there is a danger that they might take unnecessary risks to prevent the robot being damaged. There are stories of bomb disposal teams returning a damaged robot and saying that they want this particular robot repaired and sent back, rather than getting a new one, because they have become attached to it.

Emotional attachment is also an issue that arises with the use of robots with children. We, at Sheffield, are developing robots that can be used to assist teachers in schools. Here it's important to get the right balance. If the child has no concern or interest in the robot then it might be a less effective teaching aid. However, if a robot creates too strong a personal bond the child could become upset when the robot is taken away or used by another child. The research questions here include asking what is an appropriate level of bonding between a child and a tutoring robot and how we can design robots that will encourage appropriate forms of bonding. We should also be aware that companies that sell robots could want to create strong robot-human attachments as a way to encourage people to spend more money on the robot. One way to encourage a strong bond is for the robot to have needs that the human fulfils. This has been known for some time in the field of computer games and has been called the "Tamagotchi effect" after the original Japanese digital pet that owners had to care for in order to keep it 'happy'. A similar effect could be created with personal robots. But there is clearly a risk here. For some people this kind of relationship seems inauthentic—a robot cannot have genuine needs since it is not a living thing. Creating such a robot might then be thought of as unethical. However, I think that the situation is complicated. We have other toys, such as dolls, that people like to care for, so why not allow people to have, and care for, robots if they find that rewarding?

People also have physical relationships with robots, including sex. Sex toys have been around for a long-time, of course, but robotics brings the prospect of more life-like sexual companions and this is already on the horizon. For instance, there are already some life-like sex dolls with some robotic capacity. There are issues as to whether that is healthy for the individual or for society. For instance, should people be allowed to live out fantasies with sex robots that would be illegal if pursued with other people? Again, this issue is not unique to robotics—it arises with computer games and immersive virtual reality systems too. However, the idea of robots really captures people's imagination so when this issue is discussed it is often in the context of sex robots.

The issues around the possible misuse of human-like robots has led some people to argue that robots should not have a gender. Although having non-gendered robots might prevent people acting out violent fantasies concerning women, the possibility of violence towards any form of robot is also a potential concern. South Korea is considering a law to make it a criminal offence to deliberately damage a robot.

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How will laws develop in the areas where they are needed?

People are worrying a bit too much about these things getting sophisticated too quickly. It's likely to more gradual. Legislation may be worked out step-by-step. Driverless cars are exercising a lot of legal minds now as its probably the most pressing issue. Who is to blame if a driverless car is involved in an accident? Whatever we decide about driverless cars may well generalise to a lot of other situations involving robots and where there are issues around liability.

A lot of what happens will be about how we apply or extend existing law to robots. For example, rules which apply to toys and computers can also apply to robots.

It's also a question of when we legislate. We should be careful not to rush to legislation. On robot companions some of the legislation around domestic animals could be adapted or even applied directly to robots. If your robot lawnmower goes out of control and wrecks your neighbour's garden it could be equivalent to your dog doing something similar. Perhaps existing laws covering damage caused by pets could be applied.

I would see this as an evolution. The changes may occur gradually but in a decade-or-so we may find that the world is very different with robots performing many roles that humans have now. If we have a world in which robots do more of the dull, dirty or dangerous jobs—which I think will be a good thing—we will need to think about the impacts this might have on wealth inequality. How will the people who used to do those jobs earn a living? We may want to think about guaranteeing people a minimum income so that everyone is sufficiently well-off to meet their basic needs. After all, robotics should create an economic bounty and free us from doing many of the things that humans currently have to do but don't enjoy. We need to ensure that this benefits the many not just the few. There is a broader question about how people get value from their lives since for many of us that value is partly tied to the jobs that we do.

One of my goals is to get people to understand the more near-term legal and ethical issues. Then there are other long-term issues that are perhaps quite unlikely but should still make us think. For instance, the idea that we might create self-aware robots that would become a slave underclass is popular in science fiction. My view is that robots with human-like self-awareness will not be around for a very, very long time. However, theoretically I believe it is possible, so it's sensible to start considering these possible long-term futures now. Similarly, the idea that super-intelligent AIs and robots could enslave or destroy us has also been in the news a lot recently. I think that AI has a very long way to go before this could become a real threat. However, that does not mean that it is too early to start considering what safeguards we will need to introduce in order to avoid these extreme 'worst-case scenarios' becoming a reality.

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Weapons, drones and driverless cars are already raising issues that we need lawyers to apply their minds to. In the future I expect there will a lot more legal thinking to do around robotics.

Professor Prescott is also Professor of Cognitive Neuroscience at the University of Sheffield. He has a broader background in Psychology and Artificial Intelligence and a strong interest in societal and ethical issues in technology.