An Extension to the Keystroke-Level Model for Extended Reality Interactions

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ABSTRACT

From the industrial age, the concept of increased automation particularly aimed at improving efficiency in the manufacturing sector began to emerge and has only intensified through the fourth industrial revolution, to include almost all spheres of human activity ranging from military use to even civilian engagements such as hospitality and even in the health sector. This paper aims to evaluate the role of robots in society and attempt to make a case for establishing an ethical baseline for human-robot interaction.

1 INTRODUCTION

Robotics is not new to humanity as the concept can be dated back to as early as the 3rd century when a mechanical engineer known as Yan Shi presented King Mu of Zhou (1023–957 BC) with a life-size, human-shaped figure of his mechanical handiwork. That kicked off the innovation race culminating in what we know today as robotics. Several centuries later and a touch of advancement in technology has rapidly improved the possibilities and use cases of robots, the most common of which now revolves around human interaction or involvement in human activities. The concept of robotics began with the mindset of automating certain tasks. The need for robots never really gained momentum until the industrial age, where increased of population put strain on existing resources and required manufacturing processes to be more efficient and this meant achieving higher efficiency than what humans could provide at the time. This concept was later expanded to include the variety of activities beyond the manufacturing process, as we can see today to include from the range of recreational activities such as chess to health sector requirements where it was recently deployed for testing of COVID-19 patients.

In society, uncertainty has given way to fear and paranoia in the context of a robotic rebellion. And this has impacted the lens in which robots are perceived. With the role robots currently play across the workplace, it is imperative to accord them certain recognition. This should take the form of ethical guidelines which governs the interaction between humans and robots. Different proposals from various parties and individuals have yielded little impact in terms of implementation or global acceptance. Such proposals often

analyse subject matter from sector perspective, but often fail to provide the holistic approach.

2 PROVIDING AN ELIXIR TO ROBOTIC ETHICS

Robotics might not be a new concept, but the use cases have definitely evolved. Humans, while being the ultimate beneficiaries, remain the most skeptical of full scale adoption. This can be attributed partially to mistrust and uncertainty arising from the long term adoption of such technologies. Such mistrust and uncertainty was further exemplified due to the exaggeration present in the pop culture of recent times, and we can only attempt to enlighten the populace by presenting a comprehensive guideline on which the robots are mandated to operate with regards to human interaction. Such guidelines will attempt to cover a range of multi faceted topics, issues, operational standards and lot more. The most efficient way to do this would be to standardize the development process of robots on a global scale, so every entity interested in producing robots would have to comply with such guidelines. This should further be supported by forming regulatory bodies to cover up legal aspects and enforce such guidelines.

3 GUIDING PRINCIPLES FOR AN HRI CODE OF ETHICS

Considering how quickly robotics technology is evolving, these and other ethical issues will only get worse. Since ethics must be expressly considered, it follows that HRI research, development, and marketing must do the same. It would be better if debate of HRI ethics began among practitioners in order to make it simpler to incorporate ethical opinions at each level of HRI research, development, and marketing, even if members of the general public and professional ethicists will surely contribute. Situations where ethical difficulties are revealed after the fact should be avoided whenever possible. In addition, one wishes to dispel the notion that ethics is a field of knowledge totally distinct from engineering, business, and scientific practice. It's important to avoid giving the wrong idea that ethicists should be telling scientists and engineers what they can and cannot accomplish. Instead, ethics should be viewed as providing a positive contribution to the work of HRI. Therefore, the following suggested guiding principles are primarily aimed for a practitioner audience. Note that we are concentrating on the effects of HRI on people in this article. We purposefully avoid discussing any ethical issues surrounding how humans handle robots at this time since we know that they will need to be covered in a future, more thorough discussion of HRI ethics. [2]

4 CONCLUSION

The case of human and robot interaction is an interesting one, and this makes the need for ethical guidelines even more urgent. There is utter importance in developing the guidelines while the early adoption phase is in progress, rather than introducing them at the stage of full scale automation. We argue that this would be an incremental and not an immediate solution to the dilemma of human and robotics ethics. In the robot ethics literature, Isaac Asimov's laws of robotics (Asimov, 1942) have so dominated discussion about the ethics of human-robot interaction as to eclipse the day-to-day ethical challenges facing HRI research, development, and marketing. But these ethics questions are significant, and full attention to them will be required both in order to ensure more responsible practice within the HRI community and public acceptance of the technologies produced by that community. In other words, it is in the interest of HRI practitioners to take ownership of HRI ethics issues and to make attention to those issues a routine aspect of their everyday work. A culture of ethical awareness and sophistication within the HRI community will, thus, advantage the cause of HRI research, development, and marketing. [3]

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