

ETHICAL GUIDE TO DEVELOPMENT AND DEPLOYMENT OF ROBOTS

MOHAMMAD OSMAN TOKHI
London South Bank University, UK

There has been continued effort at development of guidelines and standards for the development of ethically compliant robotics technologies. The work on robot ethics, initiated by CLAWAR Association in 2012, and continued within the robotics committee of British Standards Institution (BSI) has resulted in the publication of the British Standard BS8611:2016, as the first document of its kind worldwide. The standard provides guidance to designers, developers, and users of robots through its lifecycle from design through decommissioning within an ethical framework. The focus of the standard is the impact the robotics technology may have from an ethical perspective on humans and the society, and how the risks may be reduced. Similar initiatives have been taken elsewhere. An example is the IEEE's Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems, and this has resulted in the IEEE's P7000 standards, which aim to allow organizations to demonstrate that their products conform to a high level of ethics.

The BS8611 is currently under revision so to address the emerging ethical issues of the growing robotic technology designs and applications. The revised version will include the following

- *Risk assessment:* Ethical issues are categorized into societal, application, commercial/financial, and environmental in the standard for risk assessment. Relevant ethical issues, corresponding hazards, risks, possible mitigation measures and modes of verification/validation are highlighted. The risk assessment approach of ISO12100:2010 is adopted and formulated in the framework of ethical risk assessment.
- *Ethical guidelines and measures:* The range of ethical hazards identified in the standard, such as privacy and confidentiality, Respect for human dignity and human rights, Respect for cultural diversity and pluralism, legal issues, etc. have been looked from perspective of design and corresponding design parameters are provided.
- *Verification and validation:* The standard will include detailed general information covering risk analysis, design to reduce occurrence of risks, verification via testing and verification via formal methods; mitigation; suggested methods.

Standards are provided as guidance to manufacturers and developers of technology. Their adoption is not mandatory, but rather voluntary. However, it is to the advantage of the manufacturer or developer to comply with agreed standard(s) in developing their technologies. Ethical standards, on the other hand, will involve a range of other stakeholders, such the public, end users, and regulatory bodies in complying with the guidance provided. The extent to which guidance is adhered to will impact on the future shape of the society and the character of humans in the society.

References

BS8611:2016 - Guide to the ethical design and application of robots and robotic systems.