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Interested committees:

Title: Draft BS 8611 Robots and robotic devices – Ethical design and application of robots and robotic systems – Guide

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Introduction

Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international and European standards, comments will be reviewed by the relevant UK national committee before submitting the consensus UK vote and comments. If the draft standard is approved, it is usual for the resulting published standard to be adopted as a British Standard.

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BS 8611:2023

Robots and robotic devices – Ethical design and application of robots and robotic systems – Guide

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on XX Month 2023. It was prepared by Subcommittee AMT/10/1, *Ethics for robots and autonomous systems*, under the authority of Technical Committee AMT/10, *Robotics*. A list of organizations represented on these committees can be obtained on request to the committee manager.

Supersession

This British Standard supersedes BS 8611:2016, which is withdrawn.

Information about this document

This is a full revision of the standard, and introduces the following principal changes:

- xxxxxxxx
- xxxxxxxx

This British Standard addresses issues in a field of technology that is rapidly changing and influencing society. Although efforts have been made to incorporate the anticipated effects of future developments in the standard, it is not possible for all future circumstances to have been considered or covered, for example non-embodied autonomous systems.

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It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The guidance in this standard is presented in roman (i.e. upright) type. Any recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. “organization” rather than “organisation”).

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1 Scope

This British Standard gives guidance on the identification of potential ethical harm and provides guidelines on the design control of robots through their whole lifecycle. It builds on existing safety requirements for different types of robots (e.g. industrial, personal care, service and medical).

This British Standard describes ethical hazards associated with robots and provides guidance to eliminate or reduce the risks associated with these ethical hazards. Significant ethical hazards are presented, and guidance is given on how these hazards can be addressed for various robots.

Ethical hazards are broader than physical hazards; they additionally include psychological and social hazards (physical hazards imply ethical hazards and safety design features are part of ethical design). Safety elements are covered by safety standards; this British Standard is concerned with ethical elements.

This British Standard is primarily intended for use by designers and managers.

2 Normative references

There are no normative references in this document.¹⁾

3 Terms and definitions

For the purposes of this British Standard, the terms and definitions given in BS ISO 8373 and the following apply.

3.1 autonomous system

system which has the ability to perform intended tasks based on current state, knowledge and sensing, without human intervention

3.2 ethical behaviour

observance of/adherence to respect and care for the community of life, ecological integrity, social and cultural values, economic equity, non-violence and peace

3.3 ethical harm

anything likely to compromise psychological and/or societal and environmental well-being

NOTE Examples of ethical harm include stress, embarrassment, anxiety, addiction, discomfort, deception that induces negative consequences, humiliation, being disregarded, social isolation.

3.4 ethical hazard

potential source of ethical harm

3.5 ethical risk

probability of ethical harm occurring from the frequency and severity of exposure to a hazard

3.6 ethics

common understanding of principles that constrain and guide human behaviour

3.7 harm

injury or damage to health or well-being

¹⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography.

3.8 system

set of parts which, when interoperating, has behaviour that is not present in any of the parts themselves

NOTE 1 This definition includes systems of fleeting duration, such as cars passing each other and behaving appropriately during this moment, to long-lived systems such as Voyager II.

NOTE 2 In a networked world, the robot is unlikely to be instantiated as a stand-alone device. It is more likely that it would be a component of a system, or a larger system of systems, in which the robot becomes a physical prosthesis in executing the larger system's purposes, with supervisory control of the robot exercised elsewhere, perhaps in some foreign jurisdiction. This British Standard does not consider the ethical complexities introduced by this scenario; its focus is on the ethics of interactions over time between a robot and a human being, bearing in mind that there are significant differences between individual humans in needs, capabilities, behaviours and understanding.

3.9 vulnerable people

people having reduced physical, sensory, societal, economical or mental capabilities (e.g. partially disabled, elderly having some reduction in their physical capabilities), or lack of experience and knowledge (e.g. older children)

[SOURCE: BS EN 60335-1:2012+A15:2021, **3.Z.5**]

4 Ethical risks

4.1 General

Ethical issues can be divided into societal, application, commercial/financial and environmental, as described in Clause 5 to Clause 8. Table 1 gives examples of the ethical hazards and risks associated with these issues. BS ISO 31000 gives further guidance.

Table 1 – Ethical issues, hazards and risks

Ethical issue	Ethical hazard	Ethical risk	Mitigation	Comment	Verification/ validation
Societal	Absence of trust	Robot is not used	Design to ensure reliability and transparency in behaviour	If unwanted behaviour occurs, ensure traceability to explain why the behaviour occurred	User validation Verification of transparency and reliability
	Loss of trust (human robot)	Robot no longer used or is misused, abused	Design to ensure reliability in behaviour	If unexpected behaviour occurs, ensure traceability to help explain what happened	User validation
	Deception (intentional or unintentional)	Confusion, unintended interactions and consequences (perhaps delayed), eventual loss of trust	Avoid deception due to the behaviour and/or appearance of the robot and ensure transparency and traceability of robotic nature and behaviour	—	Software verification; user validation; expert guidance
	Anthropomorphization	Misinterpretation	Avoid unjustifiable anthropomorphization Clarification of intent to simulate human or not, or intended or expected behaviour	See Deception (above) Use anthropomorphization only for well-defined, limited and socially-accepted purposes	User validation; expert guidance
	Lack of privacy and confidentiality	Unauthorized access, collection and/or distribution of data, e.g. coming into the public domain or to unauthorized, unwarranted entities	Clarity of function Control of data, justification of data collection and distribution Ensure user awareness of data management and obtain informed consent in appropriate contexts, ensuring compliance with local data protection regulations	Privacy by design Data encryption, storage location, adherence to legislation	Software verification

Table 1 – Ethical issues, hazards and risks

Ethical issue	Ethical hazard	Ethical risk	Mitigation	Comment	Verification/ validation
Application	Lack of respect for cultural diversity and pluralism	Loss of trust in the device, embarrassment, shame, offence	Awareness of cultural norms incorporated into programming	Organizational, professional, regional	Software verification; user validation
	Robot addiction	Loss of human capability, reduction in willingness to engage with others, isolation	Raise awareness of dependency	A difficult area, particularly in relation to vulnerable people Careful evaluation of potential applications is needed	User validation; expert guidance
	Change to employment	Social dislocation, job replacement, unemployment, loss of skills/need to re-skill	Targeted deployment of robots to unsocial, hazardous activities, organizational; design	—	Economic and social assessment
	Misuse	All in this column	Minimize potential for unethical use via ethical risk assessment Adherence to standards and regulations	Innovate responsibly Relate to information for use	Software verification
	Unsuitable divergent use	Unsuitable or inappropriate outcomes	Consider balance between useful/positive divergent use and inappropriate usage, inherent design	Relate to information for use	Software verification
	Dehumanization of humans in the relationship with robots	Inappropriate control exercised by the robot Loss of respect for human dignity, dehumanization and human rights	Inbuilt limits, design and implementation principles and practice	—	User validation; expert guidance