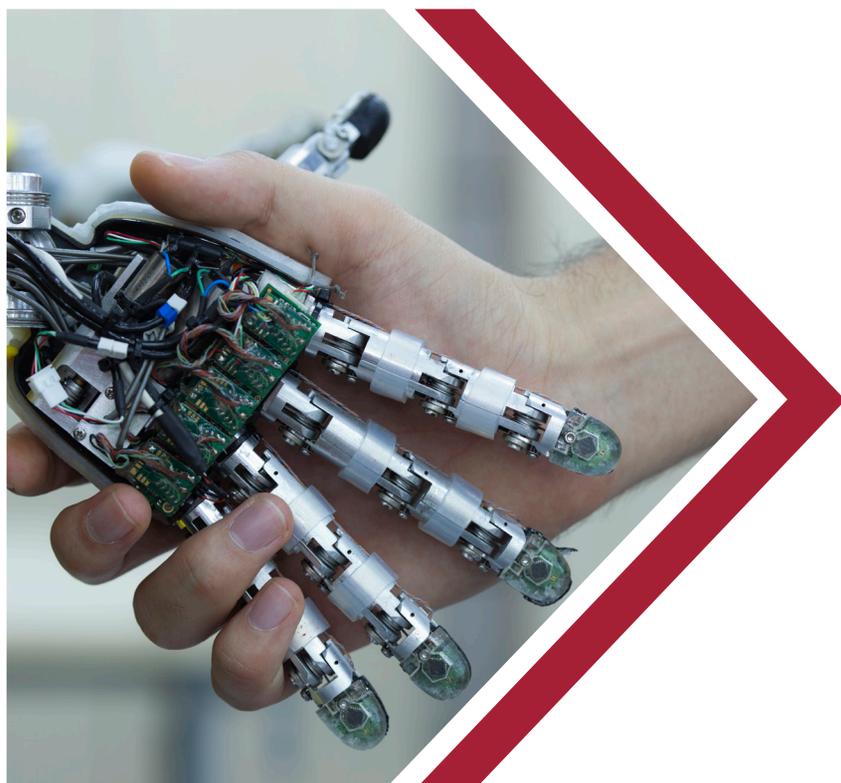


Shared Research Project

Enabling Cobots: Health and Safety Considerations



Cobots – collaborative robots – are becoming a reality in modern workplaces.

Without the traditional robot separation measures of guarding, fences or cages, the close proximity and collaborative nature of human-cobot working offers new opportunities but also some risks that must be managed.

A workshop to identify and prioritise key issues and barriers was hosted by the Health and Safety Executive (HSE) in July 2017. The workshop was attended by: cobot manufacturers; integrators; end users; industry associations; and regulators. The scope of work considered:

- Risk assessment & validation
- Design process & applications
- Standards & guidance
- Potential hazards: physical impacts, stress and ergonomics
- Organisational & cultural behaviours
- Human & psycho-social factors
- Definitions and scope
- Management of change
- Training & dissemination

Informed by the workshop, this proposal sets out to overcome the key issues/barriers with a view to promoting the safe use of cobots in practical & industrial settings.

HSE SHARED RESEARCH CENTRE

HSE has a longstanding history of supporting science and research to address a range of cross-sector health and safety issues. Building on this heritage, the HSE Shared Research Centre provides a platform to identify and co-fund applied research projects that are of interest to both industry and regulatory bodies.



Shared Research Project

Enabling Cobots: Health and Safety Considerations

Overview of Technical Work Packages

This joint research project will be delivered by a series of distinct but interrelated work packages. The specific details will be defined and agreed on a collaborative basis via the steering committee which shall be formed by project sponsors. The committee will be a partnership of industry and the regulator (HSE). The work will be led by scientific and engineering specialists at HSE supported by their regulatory colleagues, using sub-contractors if appropriate. Project co-sponsors will have a key role in also providing information and industrial application insight.

Work Package 1: What does current good practice look like?

Project sponsors will be invited to share examples of existing risk assessment input considerations, work specific situations and the positive measures taken. These will then be collated to understand the range of risk management approaches. Good practice will be identified and assimilated from case studies and other sources, as appropriate.

Deliverables

- A summary report with key findings and identified good practice.
- Set of short dissemination videos including case materials & slide set for use by the project sponsors.

Work Package 2: What improvements would be beneficial to safety standards and guidance?

Supplementing the intelligence gathered in WP1, there will be a review of existing safety standards and guidance to identify gaps. This work package will consider specific topic areas: e.g. end effectors; contact with employees or the public; physical parameters such as force, speed, impact measurement & acceleration. Recommendations aimed at addressing knowledge gaps will be made for a range of applications.

Deliverables

- A summary report with key findings to be made openly available.
- Interactions with relevant stakeholders to discuss recommendations.
- A report on the detailed findings for project sponsors who may wish to perform further analysis.

Work Package 3: How to implement cobots into work places without adversely effecting health?

In addition to the more immediately apparent safety related aspects, there are change management, organisational and human factors considerations that can strongly influence whether cobots can be effectively introduced and accepted without adversely affecting employee health and wellbeing. This work will go beyond conventional automation processes, focussing instead on the specific considerations of human-cobot working. We will propose how to 'design for health' by evaluating potential stress, workload, ergonomics and psychosocial factors of working with collaborative robots.

Deliverables

- A change management good practice guide, identifying how to successfully implement cobot technology within an organisation.
- A summary report with key findings on 'design for health' with cobots.

Work Package 4: How to conduct a risk assessment for activities with collaborative robots?

Building on knowledge gathered during WP1, a modular template for completing risk assessments will be produced. Validation of the risk assessment will be performed with project sponsor organisations and during HSE expert reviews to ensure a fit for purpose risk assessment approach is provided.

Deliverables

- A modular template for completing risk assessments with a set of prompts.
- Guidance notes to accompany the risk assessment template for both those completing and checking validity.
- A set of illustrative examples

PRICE AND PROJECT DURATION

The total funding required for this joint research project is estimated to be between £400k-£600k, depending on the specifics of the programme of work. It is therefore anticipated that with financial support from HSE, each other project sponsor would need to contribute circa £60k, with the exact contribution depending on the total number of sponsors. The project is anticipated to commence Q3 2017 and take 18 months to complete, with WP1 being completed in 6 months.

For further details, please contact us at shared.research@hse.gov.uk