

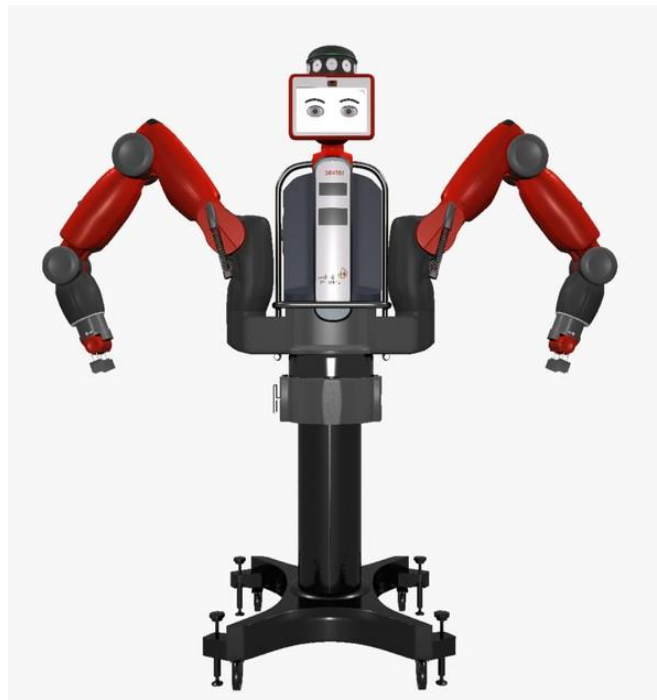


Baxter Risk Assessment Form

School Assessment No:	INFRA 34
Title of Activity:	Working with Baxter robots
Location(s) of Work:	Assisted Living Lab; Bayes Centre 1.25

Brief Description of Work:

Working with the Baxter robot for manipulation.



Hazard Identification:

Hazard(s)	Present Risk Evaluation L/M/H	Control Measures (i.e., alternative work methods / mechanical aids / engineering controls, etc.)	Risk Evaluation after control L/M/H
Impact between robotic arm and people or objects in its path (e.g., being struck by the robotic arm)	L	<p>The Baxter robot is designed to allow human-robot close proximity, however only authorised and trained operators may work within the working envelope.</p> <p>The emergency STOP button must be always within easy reach of the operator.</p> <p>The operators should be familiar with safe code of working practice for working with the robot.</p> <p>No unauthorised person should enter the robot's working envelope when robot operation is underway, unless an authorised and trained operator is present attending control of the robot.</p> <p>No unauthorised person should operate the robot.</p>	L
Crushing and trapping (e.g., part of the body being trapped between the robotic arm joints)	L	<p>Those working in close proximity to the robot should be aware of areas of possible injury, such as the small gaps in rotational joints.</p> <p>The emergency STOP button must be always within easy reach of the operator.</p>	L
Ejection of the workpiece from the grippers due to mechanical failure, malfunction, or overloading.	L	<p>The emergency STOP button must be always within easy reach of the operator.</p>	L

Slipping/tripping	L	<p>Working areas should be kept clear of obstructions.</p> <p>Any spillages should be cleaned up immediately.</p> <p>Any hazards such as trailing cables, defects to floors coverings, faulty lighting etc. should be reported immediately to the Admin Office / Local Safety Adviser or another senior member of staff.</p>	L
Electrical equipment (electrocution)	M	<p>All portable electrical equipment must be safety tested at correct intervals and labelled with the date of test.</p> <p>Electrical cables, plugs should be regularly visually inspected by the user for damage.</p> <p>Any defective equipment should be reported immediately to the Admin Office / Local Safety Adviser or another member of senior staff, then suitably labelled and taken out of use until the repair has been effected.</p> <p>Any computer hardware faults should be reported to members of computing staff.</p>	L
Fire	L	<p>Lab users must be acquainted with the Fire Routine Procedure for the area.</p>	L
Compressed Air (eye injury)	M	<p>Baxter users should read and sign the compressed air risk assessment INFRA_35, to show awareness of this issue</p>	L
Lifting of unit (back injuries)	H	<p>A risk assessment must be completed for lifting the unit.</p> <p>Follow procedures for heavy and bulky loads that present a risk of injury.</p>	L

Moving the unit (tripping/toppling)	M	Fully release stabilisers. Fully disconnect all external connections. Ensure route is clear and manageable. Move slowly and keep passers-by well clear.	L
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Engineering Controls:

Guarding		Extraction (LEV)		Interlocks		Enclosure	
Other relevant information (incl. testing frequency if appropriate):							

Personal Protective Equipment (PPE):

Eye / Face		Hand /Arm		Feet / Legs		Respiratory	
Body (clothing)		Hearing		Other (Specify)			
Specify the grade(s) of PPE to be worn:							
Specify when during the activity the item(s) of PPE must be worn:							

Non-disposable items of PPE must be inspected regularly, and records retained for inspection

Persons at Risk:

Academic staff	X	Technical staff	X	P'Grad students	X	U'Grad students	X
Maintenance staff	X	Office staff		Cleaning staff		Emergency personnel	
Contractors		Visitors	X	Others			

Additional Information:

Everyone working in an office or general area should make themselves familiar with Part Two of the University Health and Safety Policy at:
<http://www.ed.ac.uk/schools-departments/health-safety/policy-cop>

Staff/students should be familiar with the Safety Regulations for working in Office / General Areas. These can be found in the safety manuals for each building at:
<http://www.inf.ed.ac.uk/safety/>

Assessment carried out by:

Name:	Vladimir Ivan	Date:	25/08/2021
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Signature:		Review Date:	25/08/2022
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Safe system of work – Form SSW

Working with the Baxter robot – INFRA 34

INFRA 12 must be read, understood, and signed off along with this SSW, before use of the robot.

INFRA 35 must be read, understood, and signed off along with this SSW, before use of the robot with the vacuum.

The Baxter is designed to allow close human-robot interaction, however it should only be used in this manner by authorised experienced users.

Inexperienced and unauthorised users should only enter the working envelope under the direction of an experienced authorised user who is present at the time.

No unauthorised use is allowed.

Before use, the area should be checked and cleared of unnecessary items. Cables should be neatly routed, and the emergency stop button available for use.

If any injury occurs, the unit should be stopped, disabled and medical assistance sought.

Once finished. Shut down unit and any associated equipment. Ensure computer is logged out, to prevent unauthorised use.

The emergency phone number is 2222

The nearest First Aid box is in the floor kitchen

Informatics First Aider list can be found on the web at;

<http://www.inf.ed.ac.uk/safety/first-aiders.html>

