



Lab Lifting Equipment Risk Assessment Form

School Assessment No:	INFRA 55
Title of Activity:	Working with the lab lifting equipment
Location(s) of Work:	Field Robotics Lab; Bayes G.7

Brief Description of Work:

Lifting robots and heavy loads with the overhead gantry and the medical hoist.



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
Damage caused by inexperienced user	H	No user is allowed to operate the robot without having completed an induction session with an experienced and trained user, read and signed with countersignature this Risk Assessment form, or following the safety procedures described herein.	L
Falling loads	M	<p>Only loads up to the safe working load (SWL) of the device is allowed to be lifted.</p> <p>The load must be securely attached using hooks, ropes, straps, or other aids. These attachments must be rated for the weight of the load.</p> <p>When moving the load, account for mass distribution and momentum of the load when moving the load. Always lift the load before starting to move it.</p> <p>When the lifting equipment is used as a safety for falling robots, straps or similar loose attachment must be used. Keep the straps slack during the motion and track the robot throughout the whole experiment. The person operating the lifting equipment must be holding the emergency stop button and they are not allowed to perform any other task.</p> <p>All trained operators and users should be familiar with the emergency stop behaviour as well as the loss of</p>	L

		communication behaviour for both the lifting equipment and the load (when a robot is lifted).	
Crushing and trapping	M	<p>No body parts should at any point come between the load and the floor.</p> <p>When moving the load, account for momentum of the load when moving the load. Nobody is allowed in the space between the wall and the load in the direction of motion of the load. Always adjust speed and allow for safe stopping.</p> <p>When manually guiding or pushing the suspended load, move the load lowly, keep a safe distance and avoid any swinging motion. Pulling to one side creates extra forces on trolleys and is therefore forbidden.</p> <p>The emergency STOP remote must be always within easy reach of the operator.</p> <p>No person is allowed to be lifted or supported by the lifting equipment.</p> <p>The two beams of the overhead gantry must NOT be driven towards each other. The gantry does not have sensor to detect the proximity of the beams and it is up to the operator to prevent collisions.</p>	L
Slipping/tripping	L	<p>Working areas should be kept clear of obstructions.</p> <p>Any spillages should be cleaned up immediately. The equipment must not be operated on wet or slippery surfaces.</p> <p>Any hazards such as trailing cables, defects to floor coverings, faulty lighting etc. should be reported immediately</p>	L

		<p>to the Admin Office/Local Safety Advisor or another senior member of staff.</p> <p>Mobile crane must only be operated on flat surfaces. It may only be pushed up slopes up to 10° or less if the load is too heavy or unstable. The crane must always be parked and braked on levelled ground.</p>	
<p>Electrical equipment (electrocution)</p>	L	<p>The equipment must be regularly tested for electrical safety.</p> <p>Batteries should not be over-driven or charged/discharged quickly. The batteries should only be charged with an approved charger and in a safe manner.</p> <p>Any changes/adjustments to the equipment can be made only when it is powered off, the shore power is unplugged, and the charger is disconnected.</p> <p>The lifting equipment must not be operated if the batteries of both the lift (where applicable) and the e-stop are not sufficiently charged. Batteries must be charged regularly.</p> <p>Electrical cables, plugs should be regularly inspected by the user for damage. Cable management system should only be used with suitable type of cables (weight and flexibility).</p> <p>The equipment must not be turned on when wet.</p> <p>Any defective equipment should be reported immediately to the Admin Office/Local Safety Advisor or another member of senior staff, then suitably labelled and taken out of use</p>	L

		until the repair has been completed.	
Fire	L	Lab users must be acquainted with the Fire Routine and Procedure for the area.	L
Lifting of unit (back injuries)	M	The lifting equipment must not be lifted itself at any point except when disassembled according to the manual. The load must NOT be handled or partially supported manually. The load must always be lifted from and placed back onto the ground (or another stable surface/container).	L

Engineering Controls:

Guarding		Extraction (LEV)		Interlocks		Enclosure	
<p>Other relevant information:</p> <p>The overhead gantry has end-stops for slowing down and stopping the travel along each axis of motion. However, this does not include the two beams driving towards each other. The operator must ensure that the beams don't collide.</p> <p>The hoist on the overhead gantry has an overweight detection system. When the hoist stops the lifting motion, the load must be reduced.</p>							

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:

<p>All actions must be clearly and loudly communicated between all operators involved in the experiment. The lifting equipment operator must be aware of any anticipated motion of the load. When a robot is being lifted, it is advised that the lifting equipment operator also has the robot e-stop available.</p>

Assessment carried out by:

Name:	Vladimir Ivan	Date:	25/08/2021
Signature:		Review Date:	25/08/2022



Safe system of work – Form SSW

Working with lab lifting equipment – INFRA 55

INFRA 12 must be read, understood, and signed off along with this SSW, before use of the equipment inside of the robotics labs.

INFRA 02 must be read, understood, and signed off along with this SSW, before use of the equipment outside of the robotics labs.

No user is allowed to operate the equipment without having completed an induction session with an experienced and trained user, read and signed with countersignature this Risk Assessment form or following the safety procedures described herein.

All experiments requiring the use of lifting equipment must be carried out by a team of at least two people. One person must be dedicated for operating the lifting equipment and ensuring safety.

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 and the operator should carry the remote controller. When the equipment is used for ensuring safety of a robot during an experiment the operator must always follow the robot closely.

Always ensure that the load is securely attached before lifting. Ensure that the load is not attached to other items. Lift the load first by a small amount at slow speed first to ensure that this is the case.

Regularly check straps, hooks and other attachments for damage and material failure.

When the lifting equipment is not used, the hook should be parked away to minimize any overhead hazards. The remote control must be kept in a safe, visible, and accessible location.

After use, the load must be either parked in a safe location on the ground or removed, the lifting equipment must be e-stopped, powered down or switched off (where applicable), and the brakes engaged (where applicable).

All battery-operated lifting equipment must be charged regularly using the provided chargers.

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>

Verification by users

Sign below to indicate you have read and understood the safe system of work.

Working with lab lifting equipment – INFRA 55	
Signature:	Date: