

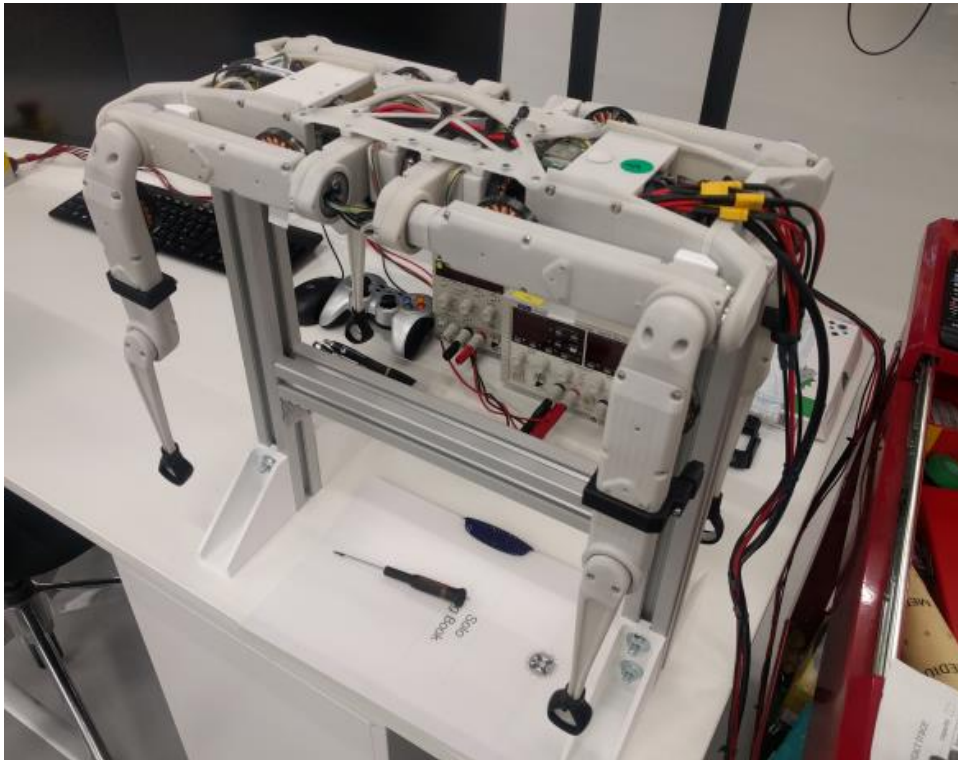


Solo12 Quadrupeed Risk Assessment Form

School Assessment No:	INFRA_61
Title of Activity:	Operating Solo12 Quadrupeed Platform
Location(s) of Work:	Field Robotics Lab; Bayes Centre G.7

Brief Description of Work:

Experimental work using the Solo12 Quadrupeed Platform



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 robot and people or objects in its path (e.g., being struck by the body of the quadruped in motion)	M	<p>Only authorised and trained operators may work with the equipment.</p> <p>The emergency STOP button must always be in hands of the operator.</p> <p>The operators should be familiar with the safe code of working practice for working with the robot.</p> <p>No person should enter the robot's working envelope when the robot is in operation unless authorised and trained operator is present attending control of the quadruped and the emergency STOP button.</p>	L
Crushing and trapping (e.g., part of the body being trapped between the quadruped and a fixed object)	L	<p>Those working in close proximity to the robot should be aware of areas of possible injury.</p> <p>All trained operators and users should be familiar with the emergency stop behaviour as well as the loss of communication behaviour.</p>	L
Burn Risk	M	<p>Users should not touch the actuators during or after operation.</p> <p>Power supply should always be attended to by the operator in order to monitor the current the robot is currently using. Power supply voltage and current should</p>	L

		be set to appropriate values based on the robot specifications.	
Ejection of parts from the robot due to malfunction, overloading, or crashing into the environment.	M	<p>The emergency STOP button must be always within easy reach of the operator.</p> <p>No person should enter the robot's working space when the robot is in operation unless authorised and trained operator is present attending control of the quadruped and the emergency STOP button.</p> <p>Inspection of the legs for damage before running should be performed by the user. Any damage should be reported, and the robot not used until fixed.</p>	M
Electric Shock	L	<p>The equipment must be regularly tested for electrical safety.</p> <p>Any changes/adjustments to the equipment can be made only when it is powered off.</p> <p>Electrical cables, plugs should be regularly inspected by the user for damage. The cables and robot should be kept away from wet environments.</p> <p>The power supply should be checked before the robot is switched on. Similarly, the power supply should be turned off after using the robot.</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>	L

Slipping/Tripping Hazard	L	<p>Working areas should be kept clear of obstructions.</p> <p>The robot's cable should be untangled before and after use. The cable should be kept on the desk after.</p> <p>Any spillages should be cleaned up immediately.</p> <p>Any hazards such as trailing cables, defects to floor coverings, faulty lighting etc. should be reported immediately to the Admin Office/Local Safety Advisor or another senior member of staff.</p>	L
Fire	L	<p>Lab users must be acquainted with the Fire Routine and Procedure for the area.</p> <p>CO2 or similar extinguishers designated for putting out electrical fires are suitable as the robot has no battery.</p>	L
Robot Modifications	L	<p>Before modifying any parts of the robot turn off the robot power supply and disconnect robot from the PC or turn off the PC.</p> <p>Refer to the internal wiki page about manuals and CAD designs (see SSW below).</p>	L

Engineering Controls:

Guarding	X	Extraction (LEV)		Interlocks		Enclosure	
Guarding by separation of unauthorized people from the robot's working environment.							

Personal Protective Equipment (PPE): Identify all necessary 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			

Authorisation and training are required prior to the use of the Solo12 Quadruped platform.

Assessment carried out by:

Name:	Traiko Dinev	Date:	20/05/2022
Signature:		Review Date:	20/05/2023



Safe system of work – Form SSW

Working with the Solo12 Quadruped robot – INFRA 50

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

The Solo12 robot 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 consult the Solo start-up procedure at <https://github.com/ipab-slmc/wiki/wiki/Solo> . Make sure you have set-up your development environment prior to using the robot as per instructions in the wiki.

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>

Verification by users

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

Signature:	Date: