

Risk Assessment

Task/Activity	Smallpeice Computing, Robotics & Electronics Summer School		Date	03/08/24
Unit/Faculty/Directorate	Electronics and Computer Science	Assessor	Dr Son Hoang	
Line Manager/Supervisor	Prof Steve Gunn	Primary site/location	Highfield Campus B59 room 59/2213	
Brief details/comments	<p>The summer school is run by the ECS department with assistance from Student Robotics Southampton and managed by the Smallpeice Trust. The students in the summer school are teenagers in Year 11 & 12 (ages 15–17) and are invited to design, build and test an autonomous robot in small teams. The robots must perform a simple task, usually involving locating and moving coloured boxes, which is performed competitively against other teams’ robots. The Smallpeice Computing, Robotics & Electronics Summer School 2024 will be held on the University of Southampton’s Highfield Campus from 5–9 August 2024. 50 students will be attending. During the week, there will be a University of Southampton ‘organisers’ (Dr Son Hoang) and fifteen mentors from Student Robotics Outreach (SRO).</p> <p>In addition to this main event, there are a number of taught laboratory sessions. Members of SRO will mentor and provide assistance to the participants, as well as set up the arena for the competition and lead the laboratory sessions. We also have Amazon Future Engineer volunteers to help in the labs.</p> <p>The summer school participants are to be always supervised by DBS-checked staff from the Smallpeice Trust (the supervisors). As a result, it is not a requirement for ECS and Student Robotics Southampton staff to have DBS certificates; however, it is still advantageous to have one. The supervisors include trained first-aiders.</p> <p>This Risk Assessment specifically covers the use of the B59 labs (Level 2) for robot assembly and of the Cube for an arena for competition matches, as well as the continuation of the construction of the robots. Manual and/or power tools will be used to assemble the arena and robot chassis and lithium polymer batteries may be used inside the robots.</p> <ul style="list-style-type: none"> • All students participating in the summer school will attend a Workshop induction and specific training (including a demonstration) in the correct use of hand tools and sign to say that they have attended. • Members of Staff and Mentors who are supervising the Workshop must have an induction and training. • Workshop must be supervised at all times when it is in use • Maximum student capacity within the workshop is 10 students • Safety glasses must be worn whilst in the workshop. <p><u>Please note:</u> This Risk Assessment is in addition the General ECS Teaching Lab Risk Assessment.</p>			

PART A										
(1) Risk identification			(2) Risk assessment				(3) Risk management			
Hazard	Potential Consequences	Who might be harmed? (Users; those nearby; those in the vicinity; members of the public)	Inherent			Control measures (use the risk hierarchy)	Residual			Further controls (use the risk hierarchy)
			Likelihood	Impact	Score		Likelihood	Impact	Score	
<p><u>COVID-19</u></p> <p>Risk of infection with the COVID-19 virus, due to the nature of the event</p>	<p>Illness and risk of spreading an infectious disease (could be very severe)</p>	<p>Staff, Supervisors, Mentors, Volunteers, and Students</p>	4	5	20	<p><u>Hands</u> - provision of hand sanitizer around the lab environment.</p> <p><u>Face</u> - face coverings not legally required, but now a matter of personal choice.</p> <p><u>Space</u> - participants encouraged to social distance wherever possible.</p> <p><u>Ventilation</u> - windows to be kept open, to provide adequate ventilation during the event.</p> <p><u>Sanitising</u> - antibacterial wipes to be available for use with the lab.</p> <p><u>Stay at home if you feel unwell</u> - whether this is due to COVID like symptoms or not.</p>	2	5	10	

PART A										
(1) Risk identification			(2) Risk assessment				(3) Risk management			
Hazard	Potential Consequences	Who might be harmed? (Users; those nearby; those in the vicinity; members of the public)	Inherent			Control measures (use the risk hierarchy)	Residual			Further controls (use the risk hierarchy)
			Likelihood	Impact	Score		Likelihood	Impact	Score	
Fire	Burns and smoke inhalation, fatality. Injury or loss of life. Total loss of building or laboratory.	Staff, Supervisors, Mentors, Volunteers, and Students	3	5	15	Local organisers will be familiar with fire alarm and evacuation arrangements for venues. Mentors to be made aware of arrangements and how to act in an emergency. Consideration must be given to arrangements for visitors with mobility difficulty, Personal Emergency Evacuation Plan (PEEP). Maximum capacities of venues must not be exceeded (check suitability of venues before event), tally of attendees to be kept and compared to published venue capacities. Helpers must be on hand to ensure all access/egress routes are kept clear and not overcrowded, splitting groups into manageable sizes.	2	5	10	1) Access to some areas must be restricted, if necessary, these to be identified to all assistants. 2) Normal building access routes must be available

PART A										
(1) Risk identification			(2) Risk assessment				(3) Risk management			
Hazard	Potential Consequences	Who might be harmed? (Users; those nearby; those in the vicinity; members of the public)	Inherent			Control measures (use the risk hierarchy)	Residual			Further controls (use the risk hierarchy)
			Likelihood	Impact	Score		Likelihood	Impact	Score	
Slips trips and falls - 1	Impact and bruising. Major and minor musculoskeletal injuries.	Staff, Supervisors, Mentors, Volunteers, and Students	4	4	16	<p>Good housekeeping to be maintained in all venues. All venues to be used by visitors will be inspected by local organisers before the event to ensure conditions are satisfactory. Consider weather conditions and ensure appropriate measures are in place.</p> <p>E&F to be contacted to deal with wet floors, slippery paths etc.</p> <p>Spills to be cordoned off / marked as soon as they occur, Mentors to maintain watch until spill cleared.</p> <p>All areas to be kept clear of trip hazards. Stands and promotional materials must not obstruct access/egress routes. No trailing wires across walkways, reroute or use cable covers. Checks made before event start by local organisers.</p>	2	4	8	3) Checks made for slip and trip hazards before event start by local organisers.

PART A										
(1) Risk identification			(2) Risk assessment						(3) Risk management	
Hazard	Potential Consequences	Who might be harmed? (Users; those nearby; those in the vicinity; members of the public)	Inherent			Control measures (use the risk hierarchy)	Residual			Further controls (use the risk hierarchy)
			Likelihood	Impact	Score		Likelihood	Impact	Score	
Slips and falls - 2	Impact and bruising. Major and minor musculoskeletal injuries.	Staff, Supervisors, Mentors, Volunteers, and Students	4	4	16	Any spills to be cleared up immediately (mentors to have access to spill clearance equipment or be aware of how to inform Domestic Services).	2	4	8	3) Checks made for slip and trip hazards before event start by local organisers.
Manual Handling	Sprains and MSD. Musculoskeletal injury, RSI type injury.	Staff, Supervisors, Mentors, Volunteers, and Students	3	3	9	Staff/mentors to be provided with or be aware of trolleys etc. for moving heavy materials/equipment. All staff/mentors to be briefed that they should not attempt to lift or move heavy objects without assistance. Due to space arrangements some teams will be required to transport unwieldy items (their robots) between floors of the building and to the Cube. Elevators should be used for this when possible; in the event of elevator failure, extra caution must be taken when using the stairs.	2	3	6	4) All attendees to be made aware of the locations of the building's elevators.

PART A										
(1) Risk identification			(2) Risk assessment				(3) Risk management			
Hazard	Potential Consequences	Who might be harmed? (Users; those nearby; those in the vicinity; members of the public)	Inherent			Control measures (use the risk hierarchy)	Residual			Further controls (use the risk hierarchy)
			Likelihood	Impact	Score		Likelihood	Impact	Score	
Personal injury / illness	Injury / Illness	Staff, Supervisors, Mentors, Volunteers and Students	2	3	6	Events on normal University working days will be adequately served by normal local first-aid cover. All mentors etc. are briefed on these arrangements, location of first-aid supplies and know how to summon assistance.	1	3	3	5) Request information on pre-existing medical conditions and circulate to mentors, briefing on First Aid provision.
Welfare	Illness	Staff, Supervisors, Mentors, Volunteers and Students	3	2	6	All normal toilet facilities to be available to visitors. Conditions in toilets to monitored and issues raised with E&F.	1	2	2	6) All mentors to be briefed on locations of WCs so they may direct visitors accordingly.

PART A										
(1) Risk identification			(2) Risk assessment					(3) Risk management		
Hazard	Potential Consequences	Who might be harmed? (Users; those nearby; those in the vicinity; members of the public)	Inherent			Control measures (use the risk hierarchy)	Residual			Further controls (use the risk hierarchy)
			Likelihood	Impact	Score		Likelihood	Impact	Score	
Ongoing building maintenance	Injury	Staff, Supervisors, Mentors, Volunteers and Students	3	4	12	Work with E&F and Faculty Resources Officer to suspend all non-essential building works during the Event where necessary. On-going work areas to be cordoned off and signed to prevent unauthorised access.	1	4	4	7) All organisers and mentors to be aware of restricted areas and to divert visitors accordingly.
Electrical	Burns and shock, fatality	Staff, Supervisors, Mentors, Volunteers and Students	4	5	20	Any use of electrical equipment other than standard (light fittings and basic installation) will be separately risk assessed. All equipment used to have been PA tested. Opened food and drink is prohibited in the vicinity of computers and robotics equipment.	1	5	5	8) Mentors electrical safety check to take place before use, report concerns to local organisers.
Chemicals, machinery	Contact with dangerous materials or equipment	Staff, Supervisors, Mentors, Volunteers and Students	3	5	15	Activities include access to laboratories which have had their own specific risk assessments held by the ECS Health and Safety team.	2	5	10	

PART A										
(1) Risk identification			(2) Risk assessment					(3) Risk management		
Hazard	Potential Consequences	Who might be harmed? (Users; those nearby; those in the vicinity; members of the public)	Inherent			Control measures (use the risk hierarchy)	Residual			Further controls (use the risk hierarchy)
			Likelihood	Impact	Score		Likelihood	Impact	Score	
Vehicles	Injury from impact with vehicle.	Staff, Supervisors, Mentors, Volunteers and Students	3	5	15	Reschedule deliveries etc. to avoid locations where large numbers of visitors are anticipated. Plan pedestrian routes to avoid crossing vehicle routes.	1	5	5	9) Where this is not possible ensure, mentors are briefed and present to marshal and assist in safe passage.
Students make allegations of inappropriate behaviour by staff, mentors	Students make allegations of inappropriate behaviour by staff, supervisors, mentors	Students	3	4	12	All staff, mentors, volunteers are instructed not to be one-on-one with students.	1	4	4	
Personal injury, illness, or illegal behaviour by students	Injury / Illness	Students	3	3	9	Students will be well monitored while on the University Campus, and engaged in activities. All mentors have emergency contact details for supervisors/staff.	1	3	3	

PART A										
(1) Risk identification			(2) Risk assessment					(3) Risk management		
Hazard	Potential Consequences	Who might be harmed? (Users; those nearby; those in the vicinity; members of the public)	Inherent			Control measures (use the risk hierarchy)	Residual			Further controls (use the risk hierarchy)
			Likelihood	Impact	Score		Likelihood	Impact	Score	
Interaction with autonomous robots	Minor injury if the robots move unexpectedly	Staff, Supervisors, Mentors, Volunteers and Students	3	2	6	Robots are only to be tested under supervision. When robots are switched on, they will be treated as though they could become active at any moment. The arena is to be always supervised by a mentor. Robots must pass a safety inspection before being allowed into the arena. Staff will verify that the robotics equipment does not present any sharp edges. If any are found, they will be removed, covered, or otherwise modified to reduce the chance and severity of injury they could cause.	1	2	2	

PART A										
(1) Risk identification			(2) Risk assessment					(3) Risk management		
Hazard	Potential Consequences	Who might be harmed? (Users; those nearby; those in the vicinity; members of the public)	Inherent			Control measures (use the risk hierarchy)	Residual			Further controls (use the risk hierarchy)
			Likelihood	Impact	Score		Likelihood	Impact	Score	
Lithium polymer batteries	LiPo batteries can ignite if damaged or misused, resulting in smoke/fire.	Staff, Supervisors, Mentors, Volunteers and Students	3	5	15	Boxes containing batteries are clearly labelled as such and will be always handled with care. Batteries will be routinely inspected by staff for signs of damage or swelling and set aside for safe disposal if necessary. Batteries are only to be charged by trained staff. The battery charging procedure is to be always followed. Batteries are only to be given to teams once their robot has passed a safety inspection by a member of staff. This inspection must check, among other things, that the robot's battery compartment is rigid enough to resist damage to the battery.	2	5	10	

PART A											
(1) Risk identification				(2) Risk assessment					(3) Risk management		
Hazard	Potential Consequences	Who might be harmed? (Users; those nearby; those in the vicinity; members of the public)	Inherent			Control measures (use the risk hierarchy)	Residual			Further controls (use the risk hierarchy)	
			Likelihood	Impact	Score		Likelihood	Impact	Score		
Use of manual and/or power tools	Minor injury because of an accident or through improper use of tools.	Staff, Supervisors, Mentors, Volunteers and Students	4	4	16	All students will attend a Workshop induction and specific training (including a demonstration) in the correct use of hand tools. Safety glasses must be worn whilst in the workshop. If using a saw, knife or file, keep your hands above the tools cutting edge and the work piece. Care will be taken with tools to ensure that possible injury is minimal in the event of an accident. Power tools are only to be used by a responsible trained adult.	2	4	8		

PART A										
(1) Risk identification				(2) Risk assessment				(3) Risk management		
Hazard	Potential Consequences	Who might be harmed? (Users; those nearby; those in the vicinity; members of the public)	Inherent			Control measures (use the risk hierarchy)	Residual			Further controls (use the risk hierarchy)
			Likelihood	Impact	Score		Likelihood	Impact	Score	
Soldering	Burns through inappropriate use of soldering irons. Soldering may produce fumes which can lead to asthma.	Staff, Supervisors, Mentors, Volunteers and Students	5	5	25	All soldering irons are to be treated as if they are hot even if they are unplugged (since they may still be cooling down). Soldering will only be permitted in rooms with appropriate ventilation. Safety glasses are to be worn when soldering.	1	4	4	
Useful contacts: - <i>Domestic Services</i> : Billi-Anne Harris (Domestic Services Manager) ext. 22827 - <i>Estate & Facilities</i> : (Campus urgent requests) 023 8059 7474 (ext. 27474) - <i>Organisers</i> : Son Hoang 07474030359										

PART B - Approval					
Declaration by responsible manager: I confirm that this is a suitable & sufficient risk assessment for the activities identified above and that all residual risks can be reduced to as low as is reasonably practicable.					
Signed	<i>AColville</i>	Print name	Alexander Colville	Date	28/05/2024

PART C - Action Plan

Risk Assessment Action Plan

Part no.	Action to be taken, incl. Cost	By whom	Target date	Review date	Outcome at review date
1	Access to some areas must be restricted, if necessary, these to be identified to all assistants.	Son Hoang	3/8/24		
2	Normal building access routes must be available.	Son Hoang	3/8/24		
3	Checks made for slip and trip hazards before event start by local organisers.	Son Hoang	3/8/24		
4	All attendees to be made aware of the locations of the building's elevators.	Son Hoang	5/8/24		
5	Request information on pre-existing medical conditions and circulate to mentors, briefing on First Aid provision.	Son Hoang, mentors	5/8/24		
6	All mentors to be briefed on locations of WCs so they may direct visitors accordingly.	Mentors	5/8/24		
7	All organisers and mentors to be aware of restricted areas and to divert visitors accordingly.	Son Hoang, mentors	5/8/24		
8	Mentors electrical safety check to take place before use, report concerns to local organisers.	Mentors	5/8/24		

9	Movement near vehicles, where this is not possible ensure, mentors are briefed and present to marshal and assist in safe passage.	Mentors	5/8/24		
Responsible manager's signature:				Responsible manager's signature:	
Print name: <i>Alexander Colville</i>			Date:	Print name: <i>George Peppard</i>	
				Date	

PART D - Acknowledgement

Declaration by users: I confirm that I have read this risk assessment, understand the controls outlined herein and will report to the responsible manager any incidents that occur or any shortcomings I find in this assessment.

Signed	Print name	Job Title/Student (UG/PGT/PGR/PHD)	Date

Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	
Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	
Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	
Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	
Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	
Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	
Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	
Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	
Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	
Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	
Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	
Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	
Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	
Signed		Print name		Job Title/Student (UG/PGT/PGR/PHD)		Date	

Assessment Guidance

1. Eliminate	Remove the hazard wherever possible which negates the need for further controls	If this is not possible then explain why	
2. Substitute	Replace the hazard with one less hazardous	If not possible then explain why	
3. Physical controls	Examples: enclosure, fume cupboard, glove box	Likely to still require admin controls as well	
4. Admin controls	Examples: training, supervision, signage		
5. Personal protection	Examples: respirators, safety specs, gloves	Last resort as it only protects the individual	

LIKELIHOOD	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
		IMPACT				

Risk process

1. Identify the impact and likelihood using the tables above.
2. Identify the risk rating by multiplying the Impact by the likelihood using the coloured matrix.
3. If the risk is amber or red – identify control measures to reduce the risk to as low as is reasonably practicable.
4. If the residual risk is green, additional controls are not necessary.
5. If the residual risk is amber the activity can continue but you must identify and implement further controls to reduce the risk to as low as reasonably practicable.
6. If the residual risk is red do not continue with the activity until additional controls have been implemented and the risk is reduced.
7. Control measures should follow the risk hierarchy, where appropriate as per the pyramid above.
8. The cost of implementing control measures can be taken into account but should be proportional to the risk i.e. a control to reduce low risk may not need to be carried out if the cost is high but a control to manage high risk means that even at high cost the control would be necessary.

Impact		Health & Safety
1	Trivial - insignificant	Very minor injuries e.g. slight bruising
2	Minor	Injuries or illness e.g. small cut or abrasion which require basic first aid treatment even in self-administered.
3	Moderate	Injuries or illness e.g. strain or sprain requiring first aid or medical support.
4	Major	Injuries or illness e.g. broken bone requiring medical support >24 hours and time off work >4 weeks.
5	Severe - extremely significant	Fatality or multiple serious injuries or illness requiring hospital admission or significant time off work.

Likelihood	
1	Rare e.g. 1 in 100,000 chance or higher
2	Unlikely e.g. 1 in 10,000 chance or higher
3	Possible e.g. 1 in 1,000 chance or higher
4	Likely e.g. 1 in 100 chance or higher
5	Very Likely e.g. 1 in 10 chance or higher