

SINLGE USER BENG, MENG, MSc GROUP PROJECT RISK ASSESSMENT FORM - REPORT ONLY SIGNIFICANT HAZARDS

Unsafe working methods will lead to a reduction in your final project mark! ALL hardware work must be completed within the laboratory

the lab needs to be authorised in writing by your supervisor - supervisors please confirm with HOD/safety team to confirm. micro-controller boards which operate at <20V) equipment is allowed to be brought home. Students removing any other equipment from Students are encouraged to come on site to perform their lab work but are advised that in some circumstances (Adriano, raspberry Pi and

		THE RESERVOIR STREET OF THE PROPERTY OF THE PR
NAME- Jiajun Guo		LOCATION-
Student ID Number- 201676348	er- 201676348	Final year Laboratory
SCHOOL/DEPART	SCHOOL/DEPARTMENT: Electrical Engineering & Electronics	BUILDING: Electrical Engineering and Electronics, A-Block
Undergraduate y	Undergraduate year of study: Year 3	
TITLE OF PROJEC	TITLE OF PROJECT: Smart Sock - Project in partnership with Aintree Hospital	
Description of W	Description of Work: Develop socks with sensors to monitor frail/elderly heart failure (HF) patients for the development of ankle swelling.	allure (HF) patients for the development of ankle swelling.
Select a	Category 1 - Projects based on specialist equipment: Projects requiring equipmen	jects requiring equipment available in the electronics laboratories (such
category for	as power supplies, multimeters, oscilloscopes, etc.) or any	as power supplies, multimeters, oscilloscopes, etc.) or any other specialist equipment that requires specific health and safety
this project:	considerations (such as drones, etc.) that students would not normally be allowed to take home	not normally be allowed to take home.
	Category 2 - Projects based on "home-friendly" equipme	Category 2 - Projects based on "home-friendly" equipment: Projects requiring small pieces of equipment that do not require
Category 1	specific health and safety considerations and students car	specific health and safety considerations and students can safely use at home (Raspberry Pi's, Arduinos and other similar low-
	voltage boards with double insulated power supplies).	
	Category 3 — Projects based on software only: Projects fu	Category 3 - Projects based on software only: Projects fully based on software that can be completed using only a computer,
	without requiring any other equipment.	

If students are in an observation capacity only when experiment is being performed

- please state this on form as well as risk in being observers i.e. possible distracting experimentalist,
- State risk if they could be injured in this respect and how. Significant risks only should be stated.
- Class of any laser is required

AND >20V respectively can be regarded as potentially extremely hazardous: State voltage & current values of all power sources being used. Any power supplies that have the ability to generate current and voltages > 10mA

Voltage 5V		Current	2A			
HAZARDS W	WHO CAN BE	CURRENT CONTROLS		Like	Likelihood (L) ×	×
(Location, equipment and H.	HARMED?			Cons	Consequence (C) =	(C) =
substances, activities)				RIS	RISK SCORE (R)	R
				-	C	R
Power sources in the laboratory, People	5.	Note the low voltage (< 5V).	areas Note the low voltage (< 5V). Before using laboratory instruments, check the equipment for	ы	5	5
electrical systems working live, etc., wh	ere a fire or	damage or failure, and follow	electrical systems working live, etc., where a fire or damage or failure, and follow the equipment manufacturer's safety recommendations during			
can cause injuries such as electric exp	plosion may occur	use to avoid potential risks. Tu	can cause injuries such as electric explosion may occur use to avoid potential risks. Turn off the power after use and store as required.			
shocks, fires, and explosions. in 1	in the laboratory.					
Injuries caused by soldering, Personnel in the Use the accompanying tools, follow the correct steps, and use the	rsonnel in the	Use the accompanying tools, \cdot	follow the correct steps, and use the extractor fan to remove the	بس ر	ω	ω
including toxic gases that may be soldering work area. smoke from the soldering process	dering work area.	smoke from the soldering pro	cess.			
generated during use.						
Slips and falls Wi	th anyone nearby	Always keep the workbench o	With anyone nearby Always keep the workbench clean and tidy, and place wires and personal items properly. Pay	2	ш	2
		attention to the surrounding e	attention to the surrounding environment to avoid collisions with other workers around.			
Lithium batteries can cause fires or Worker		Use lithium batteries with pro	Use lithium batteries with product qualification certificates, production processes in line with	در	4	4
explosions.		quality control requirements,	quality control requirements, and design safety in line with relevant safety specifications. A			
		detailed laboratory test of the	detailed laboratory test of the battery is required before the experiment to assess its safety. In			
		addition, ensure that the stora	addition, ensure that the storage temperature of the battery is between -5 ° C and 35 ° C to use			
		the battery in the right enviro	the battery in the right environment to ensure that it has a good safety record and meets all			
		safety regulations.				
Muscle damage from working long Worker	·	After working for a period, tak	After working for a period, take a moderate rest, such as moving the wrist and cervical spine, to	ω	ъ	w
hours.		avoid excessive fatigue.				
The hazards of display screens on Worker		Avoid looking at the screen for	Avoid looking at the screen for too long. For example, protective glasses such as those that block	4	1	4
the eyes.		olue light can be used to redu	blue light can be used to reduce the harm of the display screen to the eyes.			

For work using only Raspberry Pi and/or Arduino boards or other hardware connected via USB cable the main hazards are Display Screen Equipment (DSE) related, e.g. Repetitive Strain Injury, Carpal Tunnel Syndrome. L=1, C=1, R=1

Training table	 All boxe 	s must be	Training table - All boxes must be ticked in the following section to indicate either YES or NO.
	8	YES	If you have ticked YES please follow the hyperlinks in the attached document, complete and
			return supplementary paperwork and/or implement and adhere to the guidance given.
Use of tenon saw/hacksaw	~		Read Safe Operating Procedure and other documentation on hand tools
Will work require the lifting of weights (>15kg)	<		Manual Handling
Laser – If yes please input class of laser. Laser	<		Please read all documents in the following link
documents and hazard should be described on	***************************************		README: Laser: information and registration
page 2 if laser is NOT class 1			Guidance on the Safe Use of Lasers in Education & Research

Use of drones	<u> </u>	Prior to the purchase of any drone equipment, please consult the safety team – even if the
		devices purchased are not intended to be flown. Please refer to drones
Use gas cylinders or compressed gas?	<	Gas Cylinder safety : Email local safety team to verify if training is required
Use hazardous Chemicals only? If stated on the	~	СОЅНН - Use on-line EEE COSHH system to create COSHH risk assessment. Email local safety
form, description of hazard is required.		team to verify if training is required
Use voltages over 30V DC/AC	<	Electrical Safety/Electricity – Includes reading the Sch. of EEE & CS dangers of electricity
If hazard has been previously described this		document
Use Power tools or rotating motors and machines	4	SCR15-4 PUWER
Use Cryogenic Liquids/gases	<u>ر</u>	Cryogenic liquids and solids — Email local safety team to verify if training is required
Use Vacuum Systems and pressurised vessels	<	Pressure systems: Email local safety team to verify if training is required
Use Radiation (UV, x-rays, microwaves)	<	UV radiation (including links to local rules & safety advisor website)

LEVEL C	LEVEL of Supervision? c		A = Work May not be started without direct supervision	
			8 = Work may not start without Supervisor advice or approval	
			C = No specific extra supervision requirements	
Other	relevant specific assessmen	ts (Local ru	Other relevant specific assessments (Local rules, Ethic approval forms)- Ethic approval forms	
Disclaimer	mer			
•	The University of Liverpool e	nsures as fai	The University of Liverpool ensures as far as is reasonably practical the health and safety of its staff and students.	
•	All equipment used by the st	udents for ti	All equipment used by the students for their project must be safety tested and approved by the laboratory technicians before use. This includes but is not limited	s before use. This includes but is not limited
	to, soldering irons, oscilloscc	pes, power s	to, soldering irons, oscilloscopes, power supplies, probes and multimeters.	
9	Students MUST NOT underto	ike hazardoi	Students MUST NOT undertake hazardous experimental/development work associated with their project outside of their designated laboratory space.	eir designated laboratory space.
9	ALL equipment that is used i	า the labora	ALL equipment that is used in the laboratory space & project MUST be purchased through the departments purchasing procedures	g procedures.
9	No equipment to be pluggea	into the ma	No equipment to be plugged into the mains supply unless circuit has been approved by technician or supervisor.	
8	Failure to abide by these cor	ditions can ı	Failure to abide by these conditions can result in the project receiving 0%.	
•	Submission of this form imp	lies acknow	Submission of this form implies acknowledgement by all the students named below.	
l can cc	nfirm that Hazards identified	and precauti	can confirm that Hazards identified and precautions specified are appropriate for the task :-	
Acknov	Acknowledgement by Student 1	Name	NameJiajun GuoSignature ว่าญานก Gเนง	Date 5, October, 2013
Acaden	Academic supervisor	Name	Namelan Sandall Signature Signature	MDate

Common reasons for previously rejection of the form

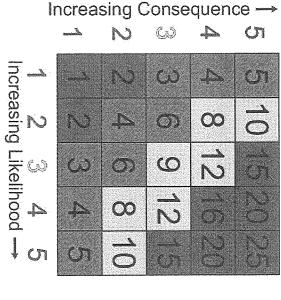
- Project category was not stated on the assessment.
- Contradiction of hazards listed on page 2 compared those identified in training table. Users inserted description of hazards such as chemicals & live working but failed to insert yes in hazard table. Only hazardous chemicals should be described. Only significant hazards observed in experimental process should be described.

- Missing supervisor signature risk assessment is invalid & students cannot enter the laboratory area
- Additional hazards noted in training table that are not described in hazard section. Lasers were described in training table required but hazard was not described in main assessment. Laser users should refer to risk assessment template document to identify how these should be described

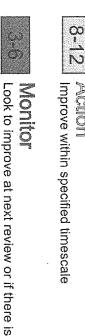
GUIDANCE TO COMPLETE THIS RISK ASSESSMENT FORM (LIKELIHOOD / CONSEQUENCE / RISK SCORE)

			*	- H
Likelihood	Consequence		Risk score	ACTION TO BE TAKEN
1 Very	1	Insignificant – no injury	1-2 NO ACTION	No action required but ensure controls are
unlikely				maintained and reviewed.
2 Unlikely	2	Minor – minor injuries needing first aid	3-9 MONITOR	Look to improve at next review of if there is a
-				significant change
3 Fairly likely	3	Moderate – up to seven days absence	8-12 ACTION	Reduce risk if possible, within specified timescale
4 Likely	4	Major – more than seven days absence; major injury	15-25 STOP	Stop activity and immediate action
5 Very likely	5	Catastrophic – death; multiple serious injury		

Display Screen Equipment (DSE) related, e.g. Repetitive Strain Injury, Carpal Tunnel Syndrome. L=1, C=1, R=1 For work using only Raspberry Pi and/or Arduino boards (i.e. no other hardware connected using additional power supplies) the only hazards are







a significant change

Action.

