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| UTS SAFE WORK METHOD statement (SWMS) |

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| 1. **FACULTY/SUBJECT** | |
| Faculty/Subject title | 41013 Robotics |
| Subject supervisor/coordinator | Gavin Paul |
| SWMS prepared by | Khai Minh Tran, Daniel Selmes |

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| 1. **WORK ACTIVITY DESCRIPTION** | | | | | | |
| Describe the work activity E.g. Operating, Handling, Using.. Include names of hazardous equipment, substances or materials used,  and any quantities and concentrations of substance(s) or reaction products. | The activity required the use of the cyton (Han’s Cute) robot and a RGB camera to regconised objects on the workplace that is out of place. After the objects has been identified by the camera, the robot will move to its location to either move the object to other location or remove it by other means.  The robot can also be manually moved for calibration and jogging purposes. | | | | | |
| 1. HAZARDS: Choose those hazard types that will need to have control measures in Section 4 | | | | | | |
| **Work Environment**   * Working in Remote Locations * Working Outdoors/fieldwork * Clinical/Industrial setting * Poor ventilation/Air quality * Temperature extremes * Working at Height * Slip/Trip/Fall hazards | | **Plant**   * Noise * Vibration * Working with compressed air * Lifts Hoists or Cranes * Moving parts (Crushing,friction, cut, stab, shear hazards) * Pressure Vessels or Boilers | | **Chemical**   * Hazardous Chemicals use * Skin/eye irritant * Sensitiser * Mutagen * Carcinogen * Toxic to reproduction * Aquatic toxicity * Toxic * Corrosive * Dangerous when wet | | **Ergonomic/Manual Handling**   * Repetitive or awkward movements * Lifting heavy objects * Over reaching * Working above shoulder or below knee height * Poor workstation set up |
| **Electrical**   * Plug in equipment * High voltage * Exposed wiring * Exposed conductors | | **Radiation**   * Ionising Radiation * Non-ionising radiation (Lasers, Microwaves, Ultraviolet light) | | **Biological**   * Sharps/Needles * Cytotoxins * Pathogens/infectious materials * Infectious materials * Communicable diseases * Animal/insects * Work with fungi/bact/viruses | | **Psychosocial**   * Aggressive or violent clients/students * Working in isolation * Working with timeframes * Staffing issues |
| 1. **CONTROLS MEASURES: Choose those that apply for hazards identified** | | | | | | |
| **Eliminate/Isolate/Substitute / Engineering Controls**   * Remove hazard * Restrict access * Redesign equipment * Guarding / Barriers / Fume Cupboard / exhaust * Biosafety cabinet * Use safer materials/substances * Ventilation * Regular maintenance of equipment * Redesign of workspace / workflow | | | **Admin specific: Licenses/permits Work Methods**   * Training Information or Instruction * Licensing or certification of operators * Test and tag electrical equipment * Restricted access * Regular breaks * Task rotation * Work in pairs * Document Chemical risk assessment * Ladder / Sling register | | **Emergency Response Systems**   * First aid kit * Chemical spill kit * Safety shower * Eye wash station * Emergency Stop button * Remote Communication Mechanism | |
| **Other controls not listed** | | | | | | |
| 1. **PPE REQUIRED (Tick those that apply)** | | | | | | |
| http://www.orr.uts.edu.au/images/pictograms/protection/hand.pnghttp://www.orr.uts.edu.au/images/pictograms/protection/face.pnghttp://www.orr.uts.edu.au/images/pictograms/protection/eye.pnghttp://www.orr.uts.edu.au/images/pictograms/protection/hearing.pnghttp://www.orr.uts.edu.au/images/pictograms/protection/foot.pnghttp://www.orr.uts.edu.au/images/pictograms/protection/ppe.png | | | | | | |
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| 1. **EMERGENCY EQUIPMENT** | | | | | | |
| http://www.orr.uts.edu.au/images/pictograms/equipment/eyewash.pnghttp://www.orr.uts.edu.au/images/pictograms/equipment/spill.pnghttp://www.orr.uts.edu.au/images/pictograms/equipment/shower.png | | | | | | |
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| 1. **work activity steps** |
| **before you start:**  Check equipment connection and safety feature. Ensure the robot is placed on firm foundtation and the surrounding is clear when it is in motion.  Ensure operators and any nearby personnel are familiar with the location and operation of the emergency stop button and stopping the software from the control computer.  **steps in work activity:**  When operating the robot  Check the area around the robot is clear  Start the robot and check communication with the control computer  Check the robot corresponds with the simulation on-screen before starting.  Stand clear and press the start button on the robot.  Watch the robot for dangerous motions or unexpected movements.  Press stop to stop the robot’s automatic operation.  Press Reset to return the robot to the original position before turning off.  When Jogging/Calibrating the robot  Check the area around the robot is clear  Start the robot and check communication with the control computer  Check the robot corresponds with the simulation on-screen before starting.  While jogging, ensure the area around the robot is clear at all times.  Stop the robot in position.  **emergency procedures:**  Emergency stop signal is sent or installed a emergency stop button when noticing abnormal behaviour in robot movement and pose  **training required**  Basic instruction in use of the robot control program  Lab safety induction |

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| 1. **sign off** | | |
| **prepared by:**  **NAME: Khai Minh Tran, Daniel Selmes** | **Supervisor**  **Name: Gavin Paul** | **Date: 04/10/2019**  **Review Date:** |