Robotics 41013: Assessment Task #4 – Final Report

Total Subject Weight: 15%. Marked out of 100, with breakdown of task marks, **(x)** specified in descriptions.
Final Submission Due: End of first week of assessment period. 23:59pm Friday 21st June.

Part		Total mark	Task mark	Description
1	Manipulate the world	50	20	Task 1: Use the Puma 560 from the Robotics toolbox and Visual Servoing over the model in *Drum.ply* with images/graphs and code inline in the report, which prove successful completion: • mount a simulated camera on the end-effector pointing out the z-axis of the last joint **(2)** • manually place at least 4 targets on the drum in Matlab **(3)** • find an initial pose where the circled area and targets can be seen **(2)** • visually servo to a closer pose where only the white plate is visible **(6)**; • then inspect the 4 corners of the front window (the desired corner for inspection should be placed in the centre of the image plane). Note that when moving to and between targets you must only use Visual Servoing techniques not ikine/ikcon **(7)** *Front view* *Side view* *Top view* *Possible setup with a different robot*
			30	Task 2: Dynamic Torque calculations for grit blasting the Drum task with a Puma560 from the Robotics toolbox. • In Matlab determine the tool transform offset to attach the blasting nozzle shown in the figure to the robot **(4)** • Either using a pose from Task 1 or using ikcon/ikine determine a starting pose that points the nozzle at one corner of the white window on the drum **(2)** ***Views of the blasting tool holder (weighing 2kg)*** Code the following two scenarios to move the arm with the 2kg tool (i.e. payload) in a straight line (blast stream pointing straight downwards) with a blasting reaction force (straight upwards) equivalent to 200N, between any two corners: • slow enough so none of the joints' maximum torques are exceeded during motion **(10)** • fast enough to overload the arm so it **cannot** achieve the task **(14)** For both for full marks, you should: • allow the full 6DOF to move whilst ensuring you obey joint limits. • include a separate plot of the angles / velocities / accelerations / torques on each joint in each motion. • include the code inline in the report. • **Don't** include collision checking/avoidance or extra safety features.
2	Robots affecting our world	45	6	Post a recent/ relevant link to a video **(2)** and scholarly article **(2)** on to the discussion board along with a brief comment on interesting facts that you discovered because of reading/viewing them. **(2)**
			5	Post a critical and considered comment responding to someone else's discussion post.
			17	*"Robots are increasingly impacting industry, our job and our daily lives in both positive and negative ways"*. Discussion with reliable literary evidence (at least 5 sources) the impact that robots will have on you, and your family into the future (roughly 500 words).
			17	Discuss your professional opinion (backed up by evidence from at least another 5 sources) regarding: "*how my job may require me to create/integrate/install robots which may result in other people no longer being required to work due to no fault of their own*" (roughly 500 words).
3	Self-Assessment	5	1	Self-assessment and comments (mark your report out of 95) and include mark breakdown in report
			4	Difference between your self-assessment mark and marks given by examiners. If off by <10 marks **(4)**, or if off by <20 marks **(3)**, or if off by <30 marks **(1)**, if off by more than 30 marks **(0)**. e.g. If you gave yourself: 60/95 and the assessor gave 55/95 you get 4/4; 80/95 and the assessor gave 55/95 you get 1/4; 90/95 and the assessor gave 55/95 you get 0/4
Overall total				

Dist: 146.32mm | 5.76in

45°

45°

Length: 206.92mm | 8.15in