Final Video Script

What‘s included:

1. Purpose (Ashe) – what and why does the robot exist and the story behind it
2. Features (Andrew) – talk about inverse kinematics, RMRC, interaction between the two robots, GUI, Robot path planning
3. Safety (Andrew) – physical and digital E-Stop, barriers, pre planned movements and Robot limitations to reduce reach of robot to outside the game table
4. GUI (Ashe) – explain all features of the GUI
5. Demonstrates learning from robots (Ashe) – briefly talk about robotics toolbox, matlab, ROS, D & H Modelling, Lectures, GIT and teamwork (most will be mentioned elsewhere so don’t double up)
6. Extensions (Andrew) – talk about multiple do bots for multiplayer players, proximity sensors, visual serving for card identification, live video in the GUI
7. Future (Ashe) – discuss any future plans or what you can see the robot doing in the future

**Features**: The two robots feature use a combination of inverse kinematics and resolved motion rate control to go about pre planned pathing for the game. Forward kinematics is utilized to confirm the pre planned movements are within a set precision to maximize the accuracy of the robots. Within the RMRC program, damp least squares is put to use to reduce the effect of singularities on the robots.

**Safety**: Safety within the system is vital in a public space with human to robot interaction. A physical e-stop is available at all times and a digital e-stop in the GUI is also available. The Hit Me Bot is barred behind a physical barrier so no-one can get close to the pinch points around the base of the robot, and there are hard limitation on the joints of the robots so they cannot twist away from the table into the open space. Signs are placed around the game area to advise no food or drinks are allowed around the robot, along with prohibition of underaged drinking, of course.

**Extensions**: With the intention of playing blackjack both with real players at the table and multiple players online, multiple do-bot magicians can be added to game table filling the empty seats. With more time to develop this idea and simulation, we would like to add a proximity sensor to reduce the velocity of the robotic arms if someone came to close as a “pre E-stop” precaution. We would also like to introduce visual servoing for card identification, and setup a live feed showing a point of view of the robot from the GUI.