**e.DO Checkers**

**User Manual**

Version 1.0

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**Introduction**

The e.DO checkers program is an application that allows the user to play a game of checkers with the e.DO Robot Arm.

The purpose of this manual is to provide a guide on how to set up the hardware for the program, as well as how to run and play the game. Information on how to run the program will be outlined in the setup section. The troubleshooting section will describe issues that may arise, and steps to address them.

**Setup**

1. Make sure hardware is set up and calibrated

Ensure that the e.DO is powered properly and is calibrated and ready to take commands.

1. Make sure everything is installed properly

Ensure that ROS Kinetic Kame and the most current e.DO core libraries are installed on the machine that will be running this program. In addition, ensure that Python 3.7 and OpenCV 4.1.0 are installed on the computer.

1. Ensure e.Do robot is on a sturdy, level surface

Ensure that the e.DO robot is on a level surface, and the checkers board is 30mm below the base of the e.DO robot arm.

1. Place the checkers board 3 inches away from the e.Do robot

Ensure that the checkers board is situated exactly three inches away from the base of the e.DO Robot, and is centered relative to the arm.

1. Make sure the camera is located 37 inches above the checkers board

Ensure that the camera is suspended 37 inches above the checkers board.

1. Line up the camera so the center of the lens is in the center of the board

Ensure that the camera is lined up with the center of the checkers board.

1. Place the checkers pieces on the board, the yellow pieces are for the e.Do robot and the green pieces are the human player.
2. Navigate to the ROS workspace on your machine, and move the e.DO Checkers package into it.
3. Open a terminal.

1. Enter “roscd edo\_checkers\_final/src”

1. Enter “python3 total\_integration.py”

1. The game should commence.

**Troubleshooting**

After you start the program, did the e.DO robot not move?

Make sure the computer running the program is connected to the e.DO wifi.

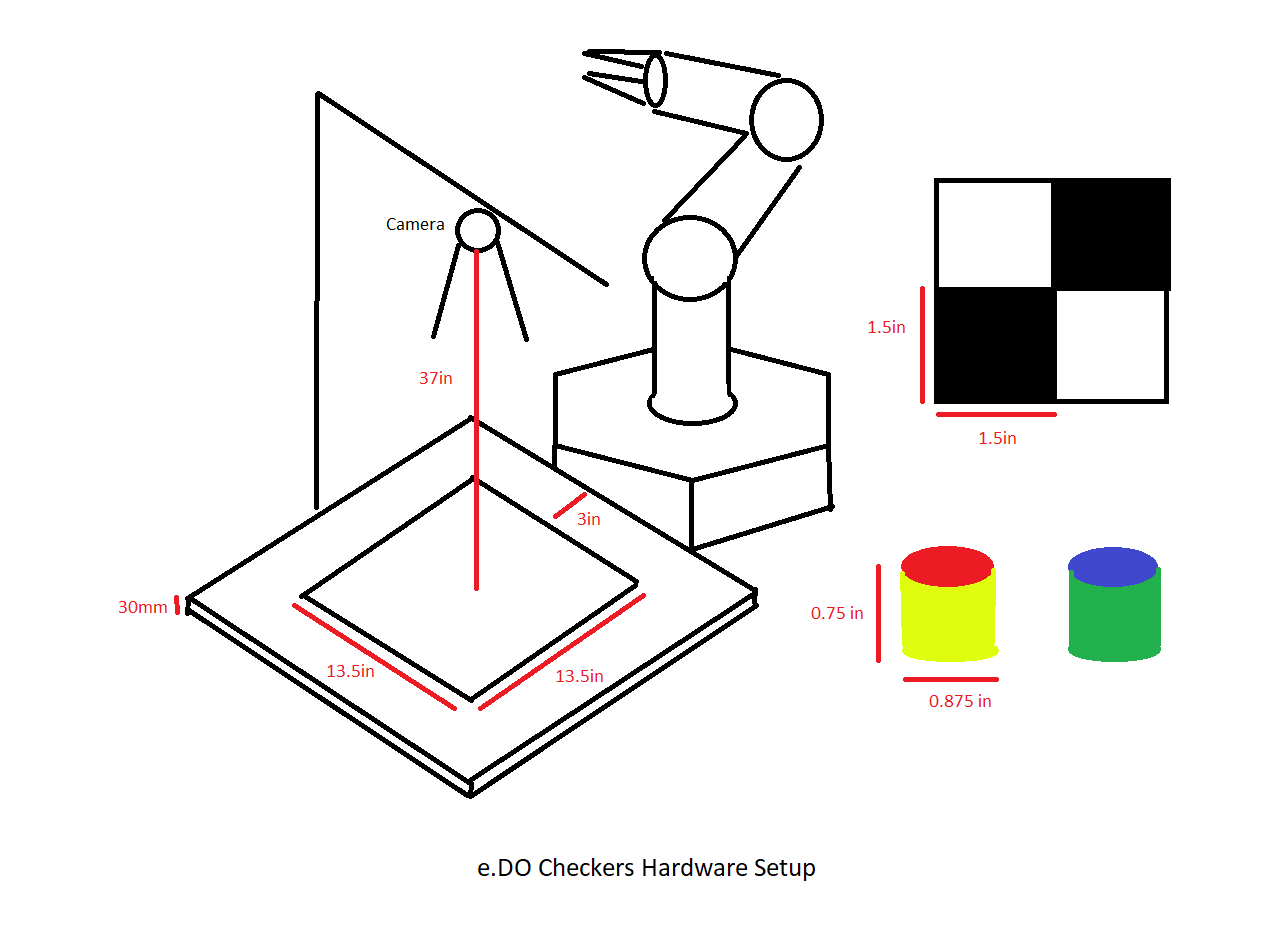
Is the e.DO robot not taking is turn after you make your turn?

Make sure that you made a valid move. Remember that if you have a jump available you must make the jump. You also double jump if you have the option.

Did the robot fail to properly pick up/ drop off a piece?

Make sure that the camera is properly calibrated and in the center of the board. Also keep in mind that the e.DO robot is not perfect and might occasionally miss a piece.

**Hardware Diagram**

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