A12 - User Manual

Year: 2023 Semester: Fall Team: 16 Project: Autonomous Air Hockey Robot

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Author: Joseph Collins Email: colli384@purdue.edu

1. Product Description

Introducing the Autonomous Air Hockey Table, the ultimate combination of cutting-edge technology and classic arcade fun. Have you ever wanted to play, but found yourself with no friends who want to join you? No problem! The Autonomous Air Hockey Table takes the usual air hockey experience and improves it by eliminating the need for a second person. This product uses high-accuracy computer vision and finely tuned motor control to respond to user actions in real time. Intended for players of all skill levels, this game will provide a dynamic and engaging experience for everyone. Let the fun begin!

1. Product Illustrations

A table with a hockey rink

Description automatically generated with medium confidence

Emergency Stop (on side)

Robot Mallet

Motors

Figure 2.1 – Full Table

**A white surface with red circles and blue lines

Description automatically generated**

Robot Mallet

Motors

**Figure 2.2 – User View**

**A close-up of a radio

Description automatically generated**

Scoreboard

Camera

**Figure 2.3 - Display**

**A white board with a red and black sticker on it

Description automatically generated**

**Figure 2.4 – Robot Mallet Rig**

**A red and yellow button on a metal surface

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**Figure 2.5 – Emergency Stop**

1. Setup Instructions

In order to ensure smooth gameplay and to prevent harm to yourself and/or the table, follow these setup instructions:

1. With the power switch flipped OFF, plug the table into a wall socket
2. Have the green puck within arm’s reach
3. Ensure nothing is obscuring the camera’s view of the table
4. Ensure nothing valuable/living is on the table
5. Flip the power switch ON
6. Hold the green puck up to the camera for 2 seconds to calibrate the camera
7. Place the green puck on the user’s side of the table, as seen from the perspective in Figure 2.2
8. Usage Instructions

Following proper setup, you should now be able to play air hockey! General usage is as follows:

* Strike the puck as you normally would. The robot will attempt to intercept the puck and send it back to your side of the table
* If the robot misses, it will attempt to strike the puck where it lies
* During gameplay, be sure not to obscure the camera’s view of the puck and mallet
* Scoring done by the user or the robot will result in a change in the values displayed on the scoreboard
* The puck will need to be removed from the retrieval slot manually if the robot is scored on. Do this with caution and be sure not to place extremities on the table or near the motors

1. Troubleshooting Instructions

*Q: Why is the table not turning on?*

Ensure that the plug is inserted properly in a wall socket. If the issue persists, check the cable’s connection to the table.

*Q: Why are the motors spinning, but the mallet is not moving?*

Check to make sure that the belt has not slipped off of any of the motors or pulleys.

*Q: Why is the mallet not going the right way to defend me?*

Turn the table off. Make sure you are in a well-lit environment and there are no objects that are similar in color to the puck and the mallet within view of the camera. Turn the table back on and make sure to hold the green puck up to the camera upon startup. This will recalibrate the camera and instruct it to follow that shade of green.

*Q: Why is the score not updating correctly?*

Ensure that there are no objects blocking the infrared sensors placed in the puck chute within the retrieval system. This will prevent the score from being incremented correctly.

*Q: What do I do if the robot mallet has rammed into the wall and will not stop?*

Quickly hit the emergency stop button. This will cut the power to the motors and the robot will instantly cease. Turn the table off. You can manually move the mallet to the center of the robot’s side by pulling the belts on that side of the table. Once the robot mallet is far from any obstructions, it should be safe to restart the table as usual.

*Q: What do I do if something valuable/living has gotten on the table?*

Quickly hit the emergency stop button. Carefully remove the object from the table.

*Q: Why does the robot seem to track the puck well until I lean over the table?*

There is a chance that an article of clothing you are wearing matches too closely to the puck or mallet. Try changing into different clothes before resuming play.

*Q: What should I do if the puck is stuck on the other side of the table and the robot cannot reach it?*

Do NOT attempt to remove it while the table is powered. Turn the table off and carefully remove the puck.

*Q: Why can’t I score against this robot?*

It seems like you should spend some more time playing! As they say, practice makes perfect!

*Q: What should I do if my question does not appear above?*

Feel free to contact us with your questions and comments at [www.autoairhockey.com/contact.html](http://www.autoairhockey.com/contact.html). Our experts will respond as soon as possible!