ECE 397

Alpha-One

Project Documentation

Introduction.

This file is created so that any user can refer back to the documentation of the project functionality.

HTC Vive Buttons and Functions:

1) Buttons:

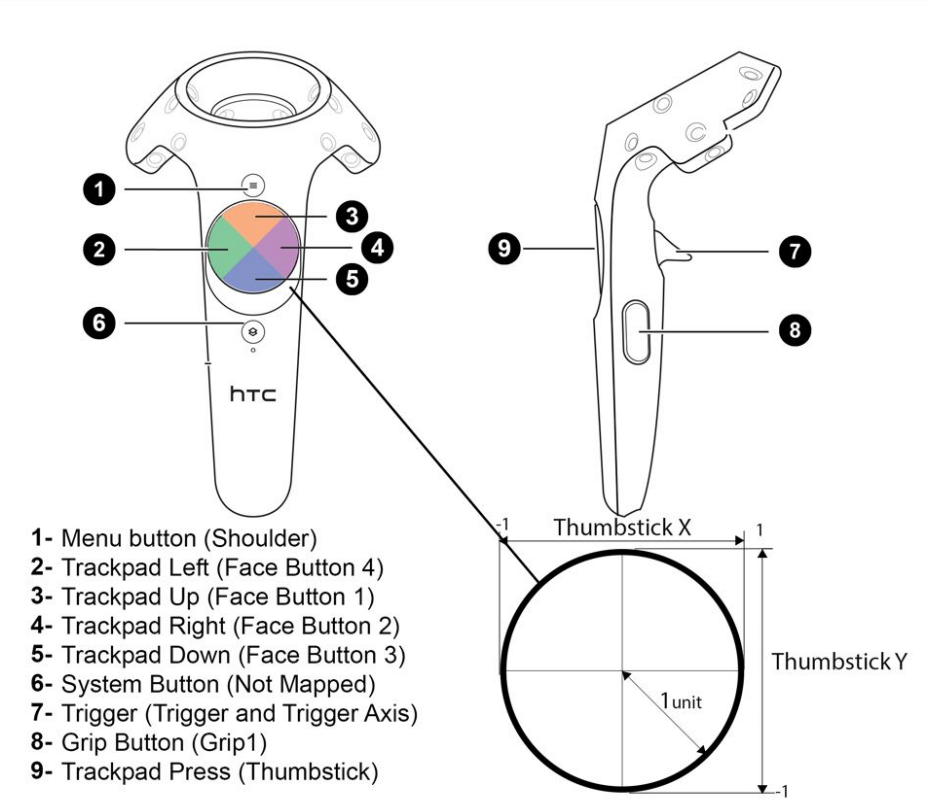

Image 1.a - HTC buttons and configuration.

We are using multiple buttons for various reasons and the button functionalities are listed below:

a) ***Menu button (1 in the image 1.a)***: We are using the button to switch the HTC vive on or off once connected to the Laptop. The menu button also acts as an emergency stop button.

b) ***Trigger button (7 in the image 1.a):*** The trigger acts control for the grip joint or Joint 6 of the robot. The trigger button can be used to grab and release objects.

c) ***Grip button (8 in the image 1.a):*** The Grip button acts as the trigger switch between different modes. We use the grip button to switch from the teaching mode and replication mode.

d) ***Trackpad down button (5 in the image 1.a):*** We are using the trackpad down button to switch between the fine grained and coarse grained motions*.

**Function modes are explained in the Functions section under teaching mode.*

2) Functions:

a) ***Teaching mode*:** Can be activated using the Grip button. Teaching mode function is the main function that collects the coordinates of the user's movements using a HTC Vive controller in a text file so the robot can later replicate those movements. The function sends the coordinates to the robot so the robot can replicate the movements of the user and give the user a real time feedback.

The function also is responsible for changing the movement modes:

- **Fine Grained:** Fine grained motions are at a smaller increments usually activated for precise movement near the object with slower speeds.
- **Coarse grained:** Coarse grained motions are the regular speed or increments of the robot to go from one coordinate to another. Usually far from the object.

b) ***Replication mode*****:** Can be activated by using the Grip Button. The Replication mode is responsible for reading the coordinates from text files and sending those coordinates to the robot so the robot can replicate the process.