



NavEYegation Technologies

System Test Plan for the *Gaze-controlled Mouse*

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The system test will consist of two sections: Unit Testing and Integration testing. During unit testing, the functionality of the gaze-tracking algorithm and the application on the user's PC (Host-PC Application) will be tested separately. During integration testing the functionality of both modules together will be tested. Testing of the gaze-tracking software during both unit testing and integration testing will be done under ideal lighting conditions.

1. Unit Testing

During unit testing, the Odroid will be preconfigured to only run the code relevant to the unit that is being tested. Peripherals such as a monitor, mouse and keyboard may be connected to the Odroid for troubleshooting and/or demonstration purposes.

1.1 Gaze-Tracking Software

1. Run gaze-tracking code
2. Verify that screen-coordinates and mouse-event flags are produced as indicated the following table

Mouse Function	Test User input	Expected output
Cursor movement	User looks at an icon on their desktop	Gaze-tracking code produces screen coordinates
Left clicking	User winks left eye	Gaze-tracking code produces a left-click flag
Right clicking	User winks right eye	Gaze-tracking code produces a right-click flag
Double-left-click	User blinks both eyes twice	Gaze-tracking code produces a Double-left-click flag
Drag	-User looks at a point on their screen -User closes one eye -User looks at another area of their screen -User opens that eye	-Gaze-tracking code produces screen coordinates and left button down flag -Gaze-tracking code produces left button up flag



1.2 Host-PC Application code dedicated to moving the cursor and causing mouse-events

1. Connect and turn on Odroid
2. Run connectivity code only
3. Run Host-PC Application
4. Verify that a connection has been established between the user`s PC and the Odroid
5. Verify that the mouse behaves as expected when the test inputs given in the following table are applied manually

Mouse Function	Test input	Expected output
Cursor movement	Screen-coordinates corresponding with an icon on the desktop	Cursor moves to that icon
Left clicking	Left-click flag	The icon is highlighted
Right clicking	Right-click flag	The context menu appears
Double-left-click	Double-left-click flag	A window associated with that icon opens
Drag	-Left-button-down flag and screen coordinates -Left-button-up flag	That icon is moved to another area on the desktop



2. Integration Testing

Integration testing consists of three stages: Connectivity, Calibration and Active. The Connectivity stage confirms that the Odroid is able to communicate with the Host-PC Application. During the calibration stage, the required calibration points are gathered. This stage also serves to confirm that the system is functioning properly in calibration mode. Finally, the Active stage verifies the capability of the Gaze-controlled mouse to operate as a regular mouse.

2.1 Connectivity

User Input: User connects the Odroid and turns it on then runs the Host-PC Application.

Expected Output:

- The Odroid enters calibration mode and waits to receive the size of the user's screen.
- An LED turns on, indicating that the connection has been established
- The Host-PC Application enters calibration mode and sends the Odroid the size of the screen
- Another LED turns on, indicating that the system is in calibration mode
- The Odroid waits for the first calibration point
- The Host-PC Application displays the first calibration point

2.2 Calibration

User Input: User looks at calibration point

Expected output during calibration:

- The Odroid collects data about the image of the user looking at the calibration point
- The Odroid waits for the an image of the next calibration point until calibration is complete

Expected output after calibration

- The Odroid tells the Host-PC Application that calibration is complete
- The calibration LED turns off and an LED indicating that the system is in active mode turns on
- The Host-PC Application goes into active mode and awaits data from the Odroid



2.3 Active

When the user performs actions given in the User Input column of the following table the corresponding result given in the Expected Output column should occur.

Mouse Function	User input	Expected output
Cursor movement	User looks at an icon on their desktop	-Odroid sends screen coordinates to the Host-PC Application -Cursor moves to that icon on their desktop
Left clicking	User winks left eye	-Odroid sends a left-click indicator to the Host-PC Application -That icon is highlighted.
Right clicking	User winks right eye	-Odroid sends a right-click indicator to the Host-PC Application -The context menu appears.
Double-left-click	User blinks both eyes twice	-Odroid sends a Double-left-click indicator to the Host-PC Application -A window associated with that icon opens
Drag	-User looks at an icon on their desktop -User closes one eye -User looks at another area of their screen. -User opens that eye	-Odroid sends screen coordinates and left button down indicators to the Host-PC App -That icon is dragged to the area of the screen that the user is looking at -Odroid sends a left button up indicator to the Host-PC App