# Pandora Vision

# Augmented Reality Telepresence

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| Test Sheet | Date: |
|---|---|

# System Test Plan for the ART System (Prototype Model)

| Head-Controlled Stereoscopic Camera (HCSC) | |
|---|---|
| | |
| **A. Performance Tests** | |
| **Test Cases** | **Comments** |
| **A.1** Video records at 720p resolution<br><br>❑Pass  ❑Fail | |
| **A.2** Video records at least 24 frames per second (fps)<br><br>❑Pass  ❑Fail | |
| **A.3** Streams 24 fps<br><br>❑Pass  ❑Fail | |
| **A.4** Streams video at 720p resolution<br><br>❑Pass  ❑Fail | |
| **A.5** Camera rotates along the yaw axis<br><br>❑Pass  ❑Fail | |
| **A.6** Camera rotates around the pitch axis<br><br>❑Pass  ❑Fail | |
| **A.7** Video latency should not exceed 5 seconds<br><br>❑Pass  ❑Fail | |
| **A.9** The latency for response to large head movements (>10 degrees) does not exceed 250 ms<br><br>❑Pass  ❑Fail | |
| **A.10** Total bandwidth for sending data should be between 4 – 7 Mb/s<br><br>❑Pass  ❑Fail | |
| **A.11** The camera mount should not jitter<br><br><br>❑Pass  ❑Fail | |
| **A.12** HCSC needs to close cleanly upon client disconnection<br><br>❑Pass  ❑Fail | |

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| A.13 HCSC needs to close cleanly upon server errors<br><br>❏Pass   ❏Fail | |
|---|---|
| A.14 HCSC needs to close cleanly upon manual shutdown<br><br>❏Pass   ❏Fail | |

| B.   Mechanical Tests | |
|---|---|
| **Test Cases** | **Comments** |
| B.1 Rotates approximately from 0 to 180 degrees in the yaw axis<br><br>❏Pass   ❏Fail | |
| B.2 Rotates approximately from 0 to 180 in the pitch axis<br><br>❏Pass   ❏Fail | |
| B.3 Weight of the cameras and the extender is less than 5.0 kg<br><br>❏Pass   ❏Fail | |
| B.4 Cables do not restrict movement<br><br>❏Pass   ❏Fail | |
| B.5 The components of the system are all stable<br><br>❏Pass   ❏Fail | |

| C.   Electrical Tests | |
|---|---|
| **Test Cases** | **Comments** |
| C.1 Electrical components connected through a well-soldered board<br><br>❏Pass   ❏Fail | |
| C.2 The input voltage is 5V for the servo motors<br><br>❏Pass   ❏Fail | |
| C.3 The system should be grounded<br>❏Pass   ❏Fail | |

| D.   Safety Tests | |
|---|---|
| **Test Cases** | **Comments** |
| D.1 Wires remain soldered upon stress<br><br>❏Pass   ❏Fail | |

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|---|---|
| **D.2** Electronic devices must be enclosed <br> ❏Pass  ❏Fail | |
| **D.3** All components have casing to enclose them to prevent from exposure <br> ❏Pass  ❏Fail | |

**Android Application**

**E.  General Tests**

| Test Cases | Comments |
|---|---|
| **E.1** Sensitive to any movement that is <10 degrees <br> ❏Pass  ❏Fail | |
| **E.2** Responsive to large movements (>10 degrees) <br> ❏Pass  ❏Fail | |
| **E.3** Converts motion data to yaw and pitch axes <br> ❏Pass  ❏Fail | |
| **E.4** Sends data to a PC through WiFi <br> ❏Pass  ❏Fail | |
| **E.5** Able to receive data from two separate video feeds <br> ❏Pass  ❏Fail | |
| **E.6** Displays two video feeds at the same time <br> ❏Pass  ❏Fail | |

**F.  Performance Tests**

| Test Cases | Comments |
|---|---|
| **F.1** Receives video feed from the HCSC <br> ❏Pass  ❏Fail | |
| **F.2** Collects accelerometer data <br> ❏Pass  ❏Fail | |
| **F.3** Collects gyroscope data <br> ❏Pass  ❏Fail | |
| **F.4** Collects magnetometer data <br> ❏Pass  ❏Fail | |

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| | |
|---|---|
| **F.5** Plays video at 24 fps <br><br> ❑Pass  ❑Fail | |
| **F.6** Measures head orientation <br><br> ❑Pass  ❑Fail | |
| **F.7** Sends head orientation data over WiFi <br><br> ❑Pass  ❑Fail | |
| **F.8** Does not cause jitter to orientation measurements <br> ❑Pass  ❑Fail | |
| **F.9** Response to large head orientation movements should not exceed 10 ms <br> ❑Pass  ❑Fail | |
| **F.10** Response to small head orientation movement should not cause jitter <br> ❑Pass  ❑Fail | |

| **G.  Software Tests** | |
|---|---|
| **Test Cases** | **Comments** |
| **G.1** Compatible with Android 5.0 <br><br> ❑Pass  ❑Fail | |

| **H.   User Interface Tests** | |
|---|---|
| **Test Cases** | **Comments** |
| **H.1** Have a user-friendly interface <br><br> ❑Pass  ❑Fail | |
| **H.2** Displays an error message if the Rpis are not connected to the PC <br> ❑Pass  ❑Fail | |
| **H.3** enters a single IP address to obtain two video feeds <br> ❑Pass  ❑Fail | |

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|---|---|

| Control System Software |
|---|

| **I. General Tests** | |
|---|---|
| **Test Cases** | **Comments** |
| **I.1** Connects to the HCSC <br><br> ❏Pass  ❏Fail | |
| **I.2** Can forward IP addresses to an Android phone <br> ❏Pass  ❏Fail | |
| **I.3** Receives head orientation from VR device <br> ❏Pass  ❏Fail | |
| **I.4** Sends head orientation data to HCSC system <br> ❏Pass  ❏Fail | |
| **I.5** Server needs to restart cleanly after disconnection <br> ❏Pass  ❏Fail | |
| **I.6** GUI should detect when RPi's server is not running <br> ❏Pass  ❏Fail | |

| **J. Software Tests** | |
|---|---|
| **Test Cases** | **Comments** |
| **J.1** Stop button in the GUI disconnects all network connections <br> ❏Pass  ❏Fail | |
| **J.2** Start button in the GUI initializes the cameras to the default position and then starts transfer of head orientation data <br> ❏Pass  ❏Fail | |
| **J.3** GUI obtains the correct IP address of the Rpi controlling the yaw-axis <br> ❏Pass  ❏Fail | |
| **J.4** GUI obtains the correct IP address of the Rpi controlling the pitch-axis <br> ❏Pass  ❏Fail | |
| **J.5** Reset button in the GUI sets the cameras to the default position <br> ❏Pass  ❏Fail | |

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