| Software Test Plan | | | | |
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| Test Description | Test Type | Test Step(s) | Expected Result | Result |
| Verify user/password authentication | Security | User enters credentials | Correct password allows user to log in | |
| Ensure all buttons work | Usability | User presses button | Each button loads correct page | Pass |
| Verify database REST command | Usability | User uploads sample data; retrieves data; updates data; deletes data | Data should be present and removed from firebase database | |
| User filters driver profile | Functionality | User enters text into search bar | Only profiles with names containing entered text will appear | Pass |
| User sorts driver profiles | Functionality | User selects option from dropdown menu | Profiles are sorted by selected attribute | Pass |
| User can edit their account | Functionality | User changes their name, email, etc and saves changes | Account now has an updated name,email, etc. | |
| Touchscreen displays correct alert based on driver status | Functionality | Simulate different driver states (Normal, Drowsy, Critical) | The UI updates to display the correct alert | |
| Verify firebase access from Jetson Nano | Usability | Simulate with sample data from firebase | Sample data will be accessible by the Jetson Nano | |
| Test alert dismissal | Functionality | Alert is simulated, user taps on the screen | Alert disappears from the screen | |
| Simulate network failure handling | Performance | Disconnect internet while running the app | UI shows "No connection" message instead of failing | |
| Verify machine learning model accuracy | Usability | Run model with various driver | Model returns a high percentage of | |

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| | | states | accuracy when detecting each state (90%) | |

| **Hardware Test Plan** | | | | |
|---|---|---|---|---|
| Test Description | Test Type | Test Step(s) | Expected Result | Result |
| MMwave sensor accuracy test | Functional | Compare detected sensor values with realistic research observations due to lack of point of reference | Values are within expected ranges | Data verified to be accurate to 90% |
| Ensure device casing can handle expected load | Durability | Place a weight of 1kg on the casing | Casing stays intact and supports load comfortably | Casing handles well over expected load |
| Buzzer sound | Functional | Feed PWM tones | Buzzer produces sound | Create PWM tones |
| Camera test | Functional | Run video streaming pipeline | Camera records and streams video | Camera records and streams video |
| Ensure stable connection to the internet | Reliability | Connect to a network, send data to the database | Data is uploaded to the database within 3 seconds | |
| IMU sensor test | Functional | Move sensor in predefined path and ensure all 6-axis measurements are received and valid | Records and displays positional information on all 6 axes (Acceleration and gyroscope data on X, Y, and Z axes). | Records and displays positional information on all 6 axes |
| Ensure system is consistently powered | Reliability | Test different voltages going into the nano via different power sources and transformers | All our sensors and outputs are properly powered | |

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| Ensure system does not thermal throttle | Reliability | Run the system for an extended period of time and verify the system still performs well | System still performs without degradation over long period of times | |