Observation System STP

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Test Plan: Observation System

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Introduction

Observation System - mounted on a telescopic pole at a height of 5 meters uses a combination of night vision and daylight cameras, GPS, azimuth system, and radar to detect people within a maximum range of 8km. The system shall identify and recognize a person from 8 km max. The system provides data to a real-time computer that communicates with the user's computer. Then, transfers the data to a video screen and map screen, along with location information. The system providing accurate and detailed information even in low-light or adverse weather conditions, weak connections and able to handle with exceptions.

Objectives

- Detection of people within a maximum range of 8km: The system aims to identify and recognize people from up to 8km, using a combination of cameras and radar technology.
- Real-time data transfer: The system shall provide accurate and detailed information in real-time, ensuring timely responses and decision-making.
- Reliability and accuracy: The system must be reliable and accurate, even in low-light or adverse weather conditions, to provide a dependable solution for surveillance, search, and rescue operations, and monitoring remote locations.
- Easy positioning and adjustment: The system should be easy to position and adjust, making it ideal for use in various environments.
- Integration with user's computer: The system shall seamlessly communicate with the user's computer, transferring data to a video screen and map screen, along with location information.
- Security: The system should provide a secure solution, ensuring the safety and privacy of data transferred between the system and the user's computer.

Testing Tree

User Interface

- Verify that all user interface elements are displayed correctly on the screen.
- Elements on the screen are responsive and interact as expected when clicked.
- Verify that the system can handle different screen resolutions and sizes.
- Check that the system responses quickly and efficiently to user interactions.
- Handle many users and interactions without slowing down or crashing.
- Corresponding with different input devices, such as touchscreens or keyboards.
- RT handling with different network conditions, slow or unreliable internet connections.

Functional

- Verify the normal reaction speed between the joystick movement, the camera display, the map, and the other systems accordingly.
- Verify the person location according to the systems and the map.
- Check if the system is recognized person perfectly and not match something else as person.
- Testing if the system can handle with more than 1 person in the frame when they are near to each other or separate.
- Check the messages between the systems in the network by a dedicated monitor.
- Testing a real time computer using a certain input and testing the corresponding output (input from the camera with a person recognition and output to the map with the correct sign).
- Sync system: check if the map is displaying the corresponding Azimuth according to the camera angle view, the Radar, and the laser rangefinder.
- Radar recognition test: check if the radar is able to recognize a person at the maximum range.

Non – Functional

- Verify that the system can handle many simultaneous user requests without any performance degradation.
- Handle with GPS problems (weak connection, connection lost, unrecognized connection, etc.)
- Verify that the system can recover from any errors or exceptions successfully.
- Security Testing: check if the system is secure and can prevent unauthorized access.

- Disaster recovery testing: Verify that the system can recover from various types of disasters (power outages, hardware failures).

Entry and Exit Criteria

Entry Criteria

- The observation system hardware and software are installed and configured according to the manufacturer's specifications.
- The observation system passes a preliminary functional test, including basic camera and radar functionality.
- The real-time communication between the observation system and user's computer is established and validated.

Exit Criteria

- All test cases in the STP have been executed and passed.
- The observation system has successfully detected and recognized people at up to 8km in a variety of lighting and weather conditions.
- The real-time data transfer from the observation system to the user's computer is functioning correctly and consistently.
- The system meets all acceptance criteria as outlined in the support documents, including performance thresholds, reliability, and security requirements.
- The observation system is documented according to the established standards, including test results, configuration data, and user manuals.

Test Strategy

Test Approach

The test approach for the observation system will focus on validating the functional and non-functional requirements provided by the client. The project will follow an agile approach with weekly iterations, with each iteration's requirements delivered to the team for testing. The testing will mainly target GUI testing to ensure a user-friendly interface.

Test Automation

Automated unit tests will be integrated into the development process, but no automated functional tests are planned at this time.

Exploratory Testing

This testing is carried out without test scripts and documentation to ensure critical defects are removed before the next levels of testing can start. The scope of this testing will cover Signup, send message, and mobile version, and will be conducted by the testing team.

User Acceptance Test

This test will focus on validating the business logic of the observation system. Test cases for UAT will be created based on inputs from end-users and business analysts. Client-side testers will conduct this testing after all other levels of testing (exploratory and functional) are complete.

Functional Testing

Functional testing will be carried out by feeding input and validating output from the observation system to ensure that it meets the functional requirements specified by the client.

Test Plan Specifications

N.	Tests	Type	Description	Expected Result
1	Camera Recognition	SW	Camera recognizes persons using AI engine	See a red rectangle surrounding new person on video as identified person
4	Camera Mode	SW	Change camera`s mode to Day, Night, Fusion	Camera changing to mode as user selected
5	Camera Focus	SW	Change camera`s focus to max and min	Camera changing to focus as user selected
6	Camera Zoom	SW	Change camera`s zoom to far and near	Camera changing to zoom as user selected
7	Camera Latency	SW	Camera Latency with glass-to-glass time	Latency should be less than 60 MS
9	Switch Cameras	SW	Change camera view from user interface	Video will change to selected camera and camera button will be colored with green
2	Joystick to RT Inputs/outputs	SW	Joystick send (x,y) movements messages to RT component and correspond to all system component	On joystick movement, check if camera moving and Azimuth map updated as well with low latency
3	Rangefinder Lazer	SW	After Camera recognizes persons, rangefinder sends ranges to RT computer and adding persons at less than 8 km	People on the map appear at less than 8 km
8	System Power up	System	After system down, all system power up with 120V	All system ready after 1 minute
10	Platform Location	SW	Place the platform in a familiar location (Latitude, Longitude)	Platform appear on map on the exact same location getting from GPS
11	Joystick Mock	SW	Send joystick (x,y) messages to RT computer to rotate the pole without a real joystick	RT get the messages and rotate the pole as written in the messages
12	Load RT computer	SW	Send a big bulk of messages to the RT computer in short time	RT computer should handle the load test perfectly
13	Cardboard of a human being	SW	Place a cardboard of a human being in range of less than an 8 KM	Person will NOT add to the map, it is not a real person
14	Multiple Person	SW	Place multiple persons in space at different locations and distance	All persons less than 8 KM should appear in the map
15	Weather condition	System	Test all system components in different weather conditions	All of component should work at the same level
16	Person in Motion	SW	Identify and recognize a person even if they are moving at different speeds such as walking, running, or driving.	Person should add and change location in map in all speed situations