Team Project:
A Surveillant Robot System
SW & HW Test Plan

Little Red Team
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Software Lists

- SW Lists for Surveillant Functions
  - WebCam32 S/W Client & Server
  - The client program
  - The server program
  - The embedded program of the surveillant robot

- SW Lists for Intruding Functions
  - The control program of the intruding robot
  - The embedded program of the intruding robot
ST#0: WebCam32 S/W

- STC 0-1: To view the room where the surveillant robot is, via the internet
  - Pass if the remote user *sees the robot* via the internet, using the WebCam 32 S/W Client and Server
SD#1: The client program

Remote Control Panel

Mode Selector

Room Live Video

Basic User Interface

Remote User

Remote Control Panel

Mode Selector

Room Live Video

Basic User Interface

Remote User

RMI/JINI Interface

Call services

Provide services

Start

Stop

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ST#1: The client program

- STC 1-1: To check the connection of RMI/JINI Interface between the client and the server
  - Pass if the client receives the response from the server, when the remote user presses the left arrow
  - Pass if the client receives the response from the server, when the remote user presses the right arrow
  - Pass if the client receives the response from the server, when the remote user presses the forward arrow
  - Pass if the client receives the response from the server, when the remote user presses the backward arrow
ST#1: The client program

- STC 1-2: To check the status of the robot
  - Pass if the client receives the information whether the robot is ready or not from the server
  - Pass if the client sends the information whether the robot is controlled or autonomous, and the server sets the mode according to the information

![Diagram of robot status transitions]

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SD#2: The server program

Surveillant Robot Controller

Main Cam

Remote Control

RMI/JINI Interface 2-1

Surveillant Task

Raise Alarm

Detection Vision & Region

Basic User Interface

Color Setting

Video Transmission

Live Video Camera

ieJOS API

Control robot

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ST#2: The server program

- STC 2-1: To control the robot when the robot is ready
  - Pass if the robot is moving left while the server program is receiving the command to move left
  - Pass if the robot is moving right while the server program is receiving the command to move right
  - Pass if the robot is moving forward while the server program is receiving the command to move forward
  - Pass if the robot is moving backward while the server program is receiving the command to move backward
ST#2: The server program

- STC2-2: To get the detection information
  - Pass if the server program gets the detection information when the robot detects an intruder
  - Pass if the server program have robot raise an alarm when the program gets the information

- STC2-3: To have the surveillant robot to wander in the room
  - Pass if the robot starts navigating the room within 3 seconds after the server commands to start the robot
  - Pass if the robot stops navigating the room within 3 seconds after the server commands to stop the robot
SD#4: The embedded program

Surveillant Robot

RS-232C/IR

IN Channel  Out Channel

Dispatcher Thread

MainThread

Remote Control Model  Surveillant Navigation Mode

Java TINY VM

RCX FirmWare

Sensors  Motors

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ST#4: The embedded program

- STC4-1: To check dispatcher thread
  - Pass if the robot is controlled by the server program (STC2-1, STC2-2, STC2-3)

- STC4-2: To check main thread
  - Pass if the robot navigates in the way expected by the lab experimenter
SD#3: The control program

Intruder Robot Controller

Detection Vision & Region

RunAway

Vision Detection

IeJOS API

RS-232C/USB

Control robot

Basic User Interface

Robot Camera

Target Colors  Take Snapshot  Average Colors

Color Setting

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ST#3: The control program

- STC 3-1: To control the robot when the robot is ready
  - Pass if the robot is moving left while the control program is receiving the command to move left
  - Pass if the robot is moving right while the control program is receiving the command to move right
  - Pass if the robot is moving forward while the control program is receiving the command to move forward
  - Pass if the robot is moving backward while the control program is receiving the command to move backward
ST#3: The control program

- STC3-2: To get the detection information
  - Pass if the control program gets the detection information when the robot detects the surveillant robot
  - Pass if the control program has robot run away when the program gets the information

- STC3-3: To have the intruding robot to wander in the room
  - Pass if the robot starts navigating the room within 3 seconds after the server commands to start the robot
  - Pass if the robot stops navigating the room within 3 seconds after the server commands to stop the robot
SD#5: The embedded program

Intruder Robot

RS-232C/IR

IN Channel

Out Channel

Dispatcher Thread

Main Thread

Intruder Navigation Mode

Runaway Navigation Mode

Java TINY VM

RCX FirmWare

Sensors

Motors

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ST#5: The embedded program

- STC4-1: To check dispatcher thread
  - Pass if the robot is controlled by the control program (STC3-1, STC3-2, STC3-3)

- STC4-2: To check main thread
  - Pass if the robot navigates expected by the lab experimenter
Hardware Lists

- HD1: The Surveillant Robot
  - Lego mindstorms : Production invention system 2.0
  - Lego mindstorms : Vision command camera
  - IR Tower

- HD2: The Intruding Robot
  - Lego mindstorms : Production invention system 2.0
  - Lego mindstorms : Vision command camera
  - IR Tower

- HD3: The WebCam
  - Logitech Quickcam Orbit WebCam
  - WebCam32 S/W Client
  - WebCam32 S/W server

- HD4: Wall parts
Hardware Lists

- HD5: A remote PC
  - Seonah’s laptop computer

- HD6: A robot main controller
  - Chankyu’s laptop computer
  - Issue: we have to get the static IP

- HD7: Another control computer
  - Kai’s laptop computer
  - Issue: can you (Kai) do it?
The Surveillant Robot

- **HTC1-1: To change its direction**
  - Pass if the surveillant robot changes the direction when it detects a wall by using touch sensors

- **HTC1-2: To wander in the room**
  - Pass if the robot moves around the every room without troubles

- **HTC1-3: To detect the intruding robot**
  - Pass if the robot raises an alarm in 5 seconds when the intruding robot is in the same room
The Intruder Robot

- HTC2-1: To intrude into the room
  - Pass if the robot comes into the room where the surveillant robot is, controlled by a lab assistant

- HTC2-2: To detect the surveillant robot
  - Pass if the robot begins to move another direction from the surveillant robot in 5 seconds after the two robots are in the same room
  - Pass if the robot runs away to exit from the room
The WebCam

- HTC3-1: To show the room where the robot is
  - Pass if the WebCam *shows the room* in their computers.
Wall parts

- HTC4-1: To check walls do not fall down
  - Pass if the wall does not fall down when a robot bumps to a wall
A remote PC

- HTC5-1: To check the environment of the remote PC
  - Pass if the client program is installed in the computer, and operates properly
  - Pass if the WebCam32 S/W Client is installed in the computer, and operates properly
A robot main controller

- HTC6-1: To check the environment of the robot main controller
  - Pass if the server program is installed in the computer, and operates properly
  - Pass if the WebCam32 S/W Server is installed in the computer, and operates properly
Another control computer

- HTC7-1: To check the environment of the control computer
  - Pass if the client program is installed in the control computer, and operates properly