Telerobotics

Functional Description
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Functional Description

Overview

This project will continue development of Telerobotics senior project that was started in the Fall of 1999. There will be two robots but they will have their own processor with a web server running on each robot. Wireless LAN technology will be used in communicating between the two robots and the Internet based clients. The robot platform that is currently under investigation, will include a Pentium processor, frame grabber, wireless LAN card, serial port, and battery charging capabilities. The Java based clients will still be able to communicate with the robots but will not have the cumbersome cables. Each robot will have sensors to pick objects or Infrared signals from the other robot. Operational testing will be performed by playing a game of "Ghost in the Graveyard" (a higher level of hide and seek). In "Ghost in the Graveyard", one robot will be designated as "it". When the robot that is "it" finds the second robot, the second user must move his/her robot back to base, which is considered a safe location where tagging cannot occur.

User Inputs	Description
Movement Command	Where the user wants the robot to go
User Outputs	
Image	Displays robots current surroundings
Game Status	Who is "it"
Sensor Status	Whether or not a proximity sensor has detected another object
Robot Inputs	
Proximity Sensor	Whether a robot or other object is nearby
Image	Current surroundings
Battery Status	Current battery level
Robot Outputs	
Movement	Robots response to movement command

Modes of Operation

Play modes

Standby mode – The system is in a sleep or battery charging mode, waiting for players to take control. If the robot senses battery capacity is below 25%, then it will find its way to the battery charging station to replenish its battery. If the battery is charged, then all systems are shut down until players take control. Users will not be able to take control of the robot if the robot is at the charging station and battery power is below 75%. This will prevent excessive docking of the robots to the charging station.

1 user – If only one client is playing then the player must search for the hidden IR signals strategically placed about the fantasy environment. The overhead camera will allow another user to watch the game.

2 users – Both robots are active and playing the "Ghost in the Graveyard" game. The users will be able to choose who wants to hide first. While the user is hiding, the seeker robot will be disabled to prevent cheating by the seeker robot user. Users are notified by on screen messages of the status of the game.

Maintenance Mode

Maintenance mode will allow the webmaster to access each robot to troubleshoot errors. An error message will be e-mailed to the webmaster to warn him or her of an error and the robot status. The webmaster will be allowed to bring up two windows to determine the location of the robot. This mode will generate a message to a user that is logged in or is trying to log in. Also the webmaster will have the option to "boot" off either user and take control of the respective robot.