

NATIONAL INSTITUTE OF TECHNOLOGY, DELHI



Project Report

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Subject Code : CSBB 304

Date Assigned : 24 Nov 2023

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Submission Title

Implementation of a Smart Garage System using IOT in Cisco Packet Tracer Simulator

Abstract

This project explores the implementation of a smart garage system leveraging IoT technology. It aims to simplify garage access through network-connected devices while ensuring security and control over various garage components like doors, windows, lights, and detectors. The implementation utilizes Cisco Packet Tracer for simulation and testing.

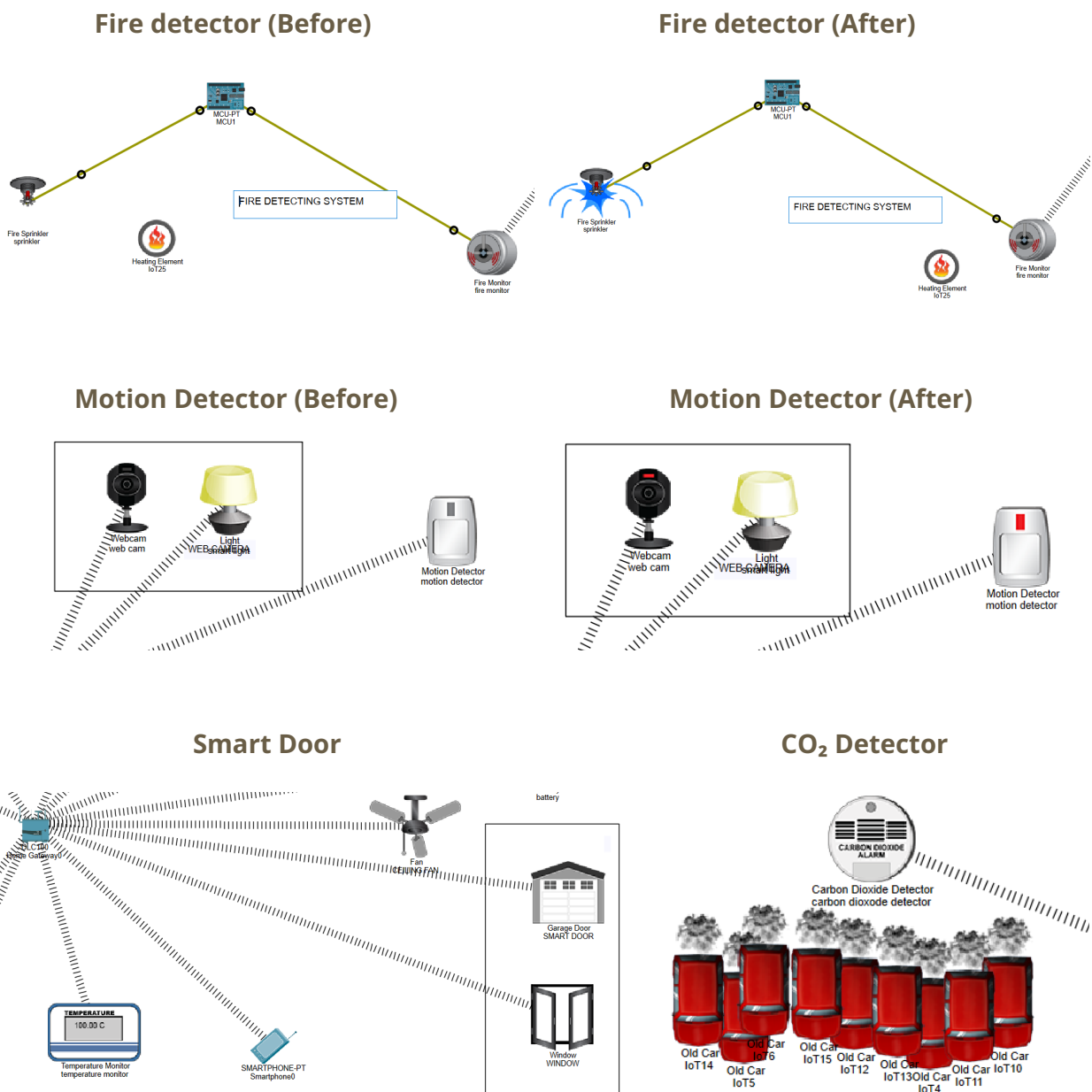
Description

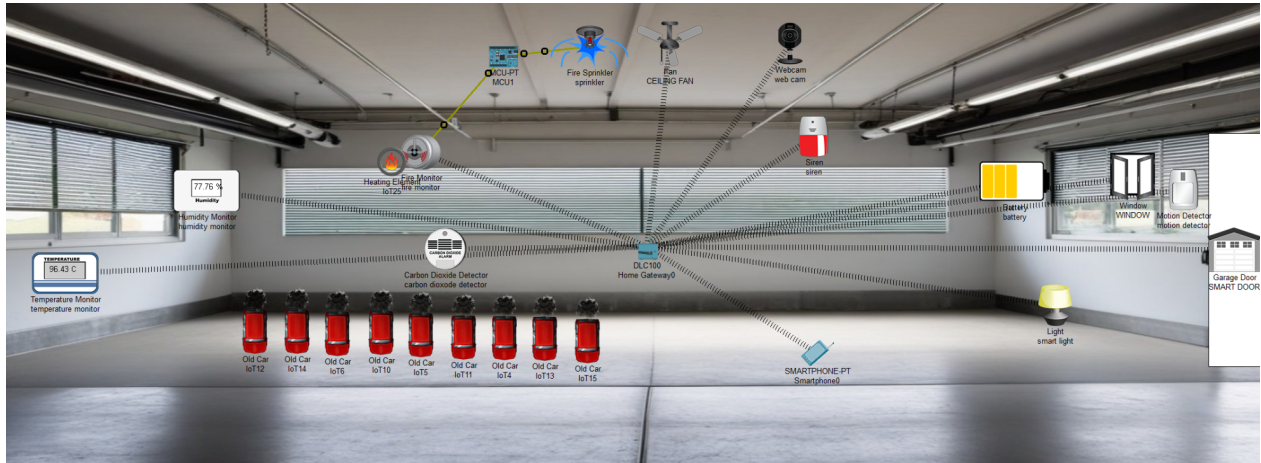
- **Climate Control:** Automatically adjusts garage temperature by opening doors and windows when CO2 levels exceed a set threshold, fostering a more comfortable environment.
- **IoT Interaction:** Enables seamless interaction among IoT devices based on user-defined conditions, enhancing system adaptability and responsiveness.
- **Remote Monitoring:** Utilizes an installed IP camera for remote garage surveillance, reducing the need for constant physical monitoring and ensuring security.
- **Efficient Lighting:** Implements scheduled lighting control, reducing both human effort and power consumption by automating on/off cycles based on predetermined schedules.
- **Smart Security:** Combines smart features with heightened security measures, offering a balance between convenience and safety in line with modern lifestyle preferences.
- **Packet Tracer Implementation:** Motivated by the trend toward smarter solutions, the project employs Packet Tracer for simulation, aligning with the ethos of working smartly rather than laboriously.

Layout

- **Smart Objects Integration:** Utilizing Cisco Packet Tracer, a variety of smart objects like doors, windows, lights, sensors, fire sprinklers, etc., are employed for comprehensive garage automation.
- **Control Infrastructure:** Microcontrollers (MCUs) and an IoT server are utilized to manage and regulate these smart objects and sensors efficiently.

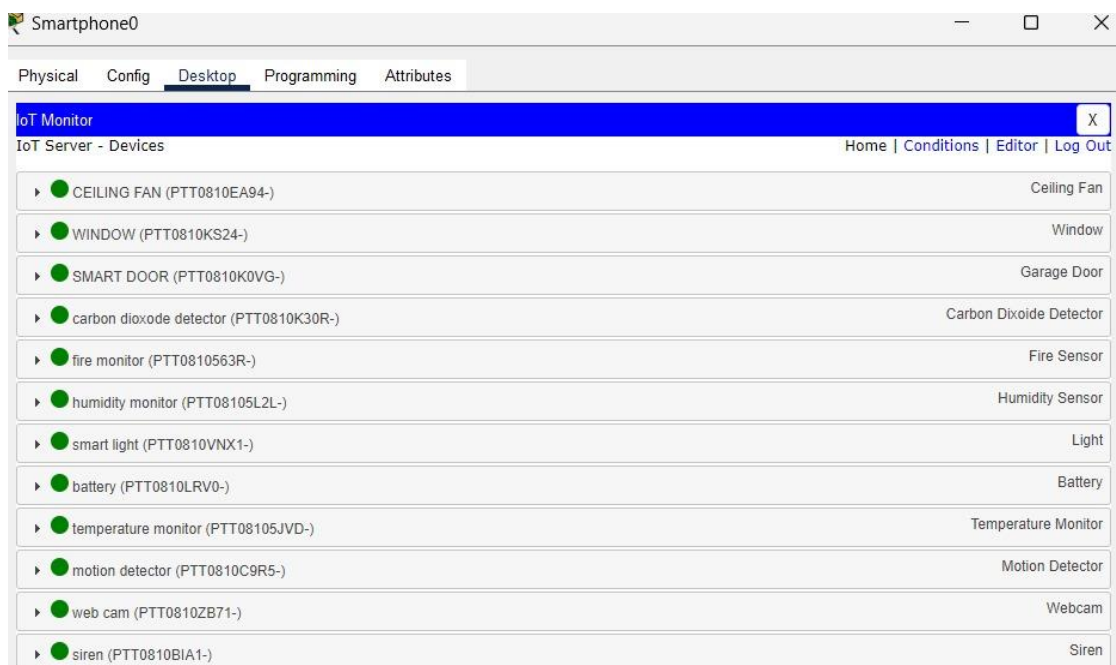
- **Network Connectivity:** Fast-ethernet cables are used to interconnect all smart objects within the garage. These objects are linked via a switch, establishing connections to the server and a controlling PC.
- **Customizable Conditions:** Conditions tailored to user preferences are programmed into the smart objects, allowing personalized control over garage functionalities.
- **Enhanced Security Measures:** Ensuring user security, a PIN lock system is implemented via mobile devices, enabling automated access control and bolstering overall garage security.





Results

- Opening of window and door when CO2 emissions are greater than threshold value set by the user
- Activating the ceiling sprinkler when the temperature and smoke level increase.
- Automated the alarm when there is any problem related to fire.
- Secured Authentications for IoT users by giving them username and password to control the smart objects
- Validated access control and functionalities, such as door and window control, utilizing network-connected devices.



The screenshot shows a web application titled "Smartphone0" with tabs for Physical, Config, Desktop, Programming, and Attributes. The "Desktop" tab is active, displaying the "IoT Monitor" section. Below the title bar, there are links for Home, Conditions, Editor, and Log Out. The main content is a table with columns: Actions, Enabled, Name, Condition, and Actions. The table lists various conditions and their corresponding actions, such as "window open", "door open", "ceiling fan on", "fire sprinkler on", "webcam", "web cam off", "siren on", and "siren off". Each row has "Edit" and "Remove" buttons. An "Add" button is located at the bottom left.

Actions	Enabled	Name	Condition	Actions
Edit Remove	Yes	window open	carbon dioxide detector Level > 1	Set WINDOW On to true
Edit Remove	Yes	door open	carbon dioxide detector Level >= 1.2	Set SMART DOOR On to true
Edit Remove	Yes	ceiling fan on	humidity monitor Humidity >= 71.5 %	Set WINDOW On to true Set CEILING FAN Status to Low Set WINDOW On to true
Edit Remove	Yes	fire sprinkler on	Match any: • carbon dioxide detector Level >= 2 • fire monitor Fire Detected is true • humidity monitor Humidity >= 80 %	Set PTT0810N8K0- Status to 1
Edit Remove	Yes	webcam	motion detector On is true	Set smart light Status to On Set web cam On to true
Edit Remove	Yes	web cam off	motion detector On is false	Set smart light Status to Dim Set web cam On to false
Edit Remove	Yes	siren on	fire monitor Fire Detected is true	Set CEILING FAN Status to Off Set web cam On to false Set siren On to true
Edit Remove	Yes	siren off	fire monitor Fire Detected is false	Set siren On to false

[Add](#)

Conclusion

This project showcases the successful execution of a smart garage system, demonstrating its practicality and functionality through simulation. The system's ability to provide secure access and control over garage components validates its potential for real-world applications within IoT-driven environments.

THANK YOU!