SMOKE DETECTION WITH FIRE PREVENTION

A COURSE PROJECT REPORT

By

RISHITA GHOSH (RA2011050010090)

TUHINA SINGH (RA2011050010049)

SRIMATHI R (RA2011050010088)

SHABNAM S M (RA2011050010071)

Under the guidance of

Dr. R Jayaraj

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BONAFIDE CERTIFICATE

Certified that this mini project report "Smoke Detection with Fire Prevention" is the bonafide work of Rishita Ghosh (RA2011050010090) , Tuhina Singh(RA2011050010049), Srimathi R (RA2011050010088), Shabnam S M (RA2011050010071) who carried out the project work under my supervision.

SIGNATURE
Dr. R Jayaraj
Associate Professor
Department of DSBS
SRM Institute of Science and Technology

ABSTRACT

Cisco packet tracer is being used to implement this project because it allows us to simulate different types of network virtually,especially,wireless networks and Internet Of Things(IoT) devices.

In the Cisco Packet Tracer, the devices appear as they are in reality, and users can monitor and interact with various wireless and IoT devices. Fire is the major cause of accidents claiming valuable lives and property. Smoke detectors play an important role in a fire prevention management program. Timely detection of the fireplace is vital for avoiding a serious accident. In this project, a Fire prevention and Smoke detection system is developed. It can sense smoke and the rise in temperature and alert the user by activating the siren and also send commands on the virtual terminal of the android phone through the wifi module. Fire hazards are not uncommon. To avoid injury from fire accidents, smoke detectors are put in high-security places. The hardware used is HomeGateway, Switches, Smoke detectors, Fire sprinklers, Smoke sensor, Wifi Module, and Siren. These smoke sensors detect smoke because the fire break associated invokes an early alarm. This way, before the fire spreads to different components of the building, people can be evacuated and countermeasures can be done immediately. The detection system operates as a fire detector and smoke detector sensor. In this, we discuss the design and implementation of a smoke detection system using the Cisco Packet Tracer which operates the entire system. These smoke & fire detection systems use automatic functions to detect the occurrence of an event that may result in a fire. They receive a sign from a fireplace sensing smoke and mechanically transmit it to the fireplace siren panel. The fire siren panel activates sprinklers and opens all windows and doors.

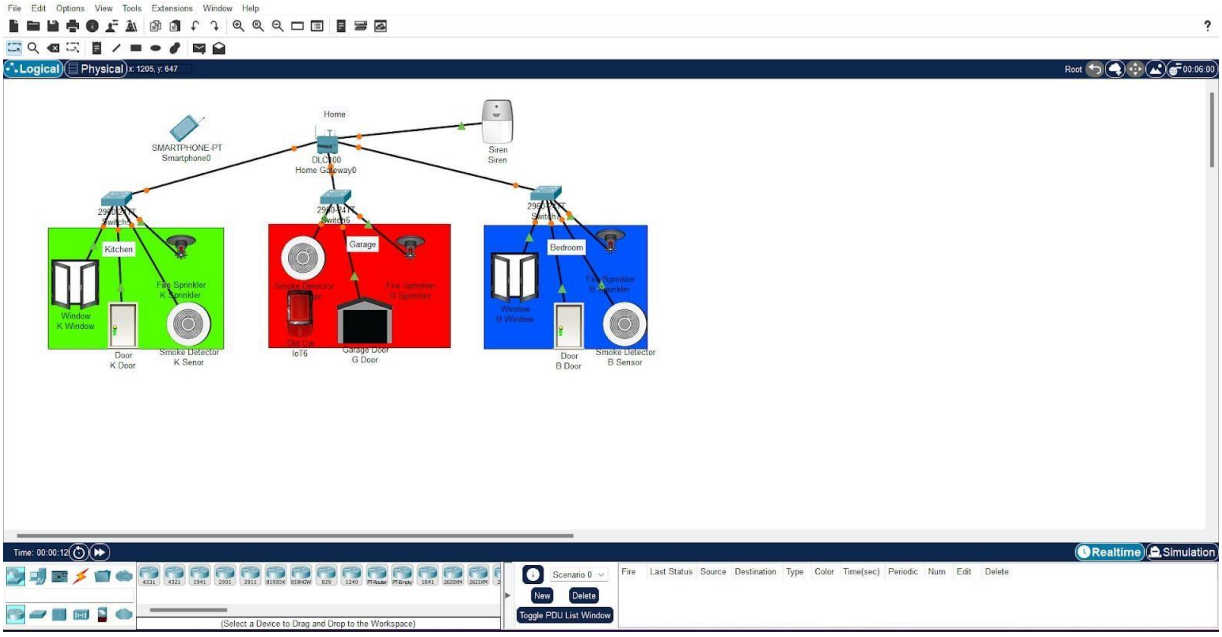
INTRODUCTION

Home fire detection is a matter of great concern, and thus many efforts are devoted in most developed countries to the design of automatic detection systems. A fire prevention system should reliably and in a timely way notify building occupants about the presence of fire indicators, such as smoke or high temperatures. A fire detector is usually implemented as a smoke sensor due toits early fire detection capability, fast response time, and relatively low cost. Other options for fire detection are based on gas sensors or temperature sensors fire detectors that use a single sensor, generally a smoke sensor, and presenthigh false-siren rates due to temperature changes. Accurate prediction of smoke detector is a very significant way of assessing detector system performance because occupants and fire service notification can be dependent upon smoke detector response. Fire Dynamic Simulator software, can be used to predict the response of smoke detector . Reference stated that “fire loss data reveals that in buildings with automatic sprinklers, 96% were controlled and extinguished by these systems”. Once there a fire, the fire detection system activates the alert thereby triggering the automatic sprinkler system. It’s very important for fire protection system to be installed in all commercial building . There are concerns associated with automatic smoke detection system arising from inappropriate techniques for quick notification, false noise tolerant and different sensor combinations . Researchers have been studying fire taking place in various places such as residential area and commercial building

PROBLEM STATEMENT

Fires cause serious damage and disrupts daily life in a devastating manner. Hence preventing them or reducing their effects is a top priority. Though there are many systems that have been created to tackle this problem, false alarms are a challenge that is yet to be avoided. Our model, using smoke sensors alerts all the home appliances so that they can take their appropriate actions. The appliances that will be alerted are doors, windows, sprinklers, garage doors

DESIGN OF THE PROJECT

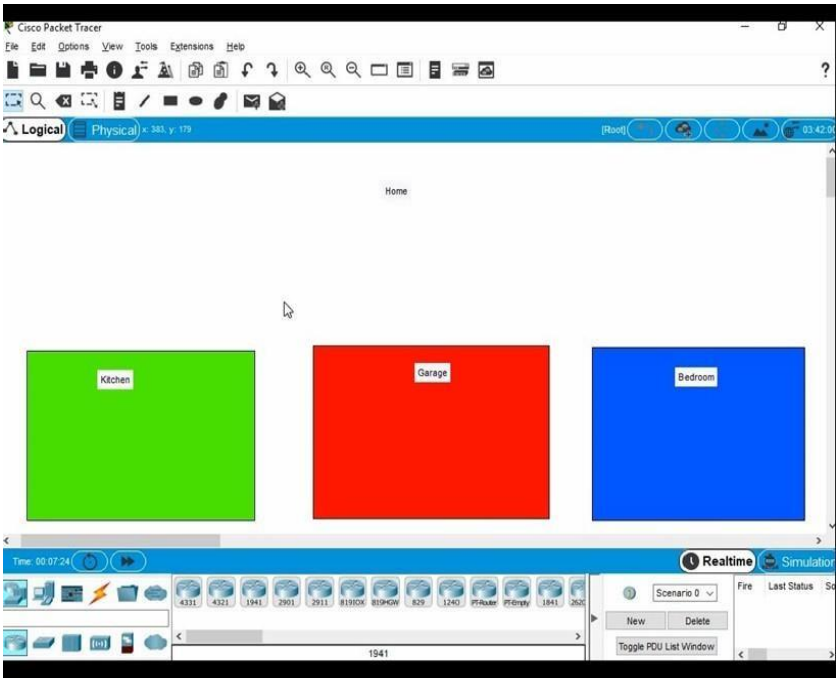


COMPONENTS NEED

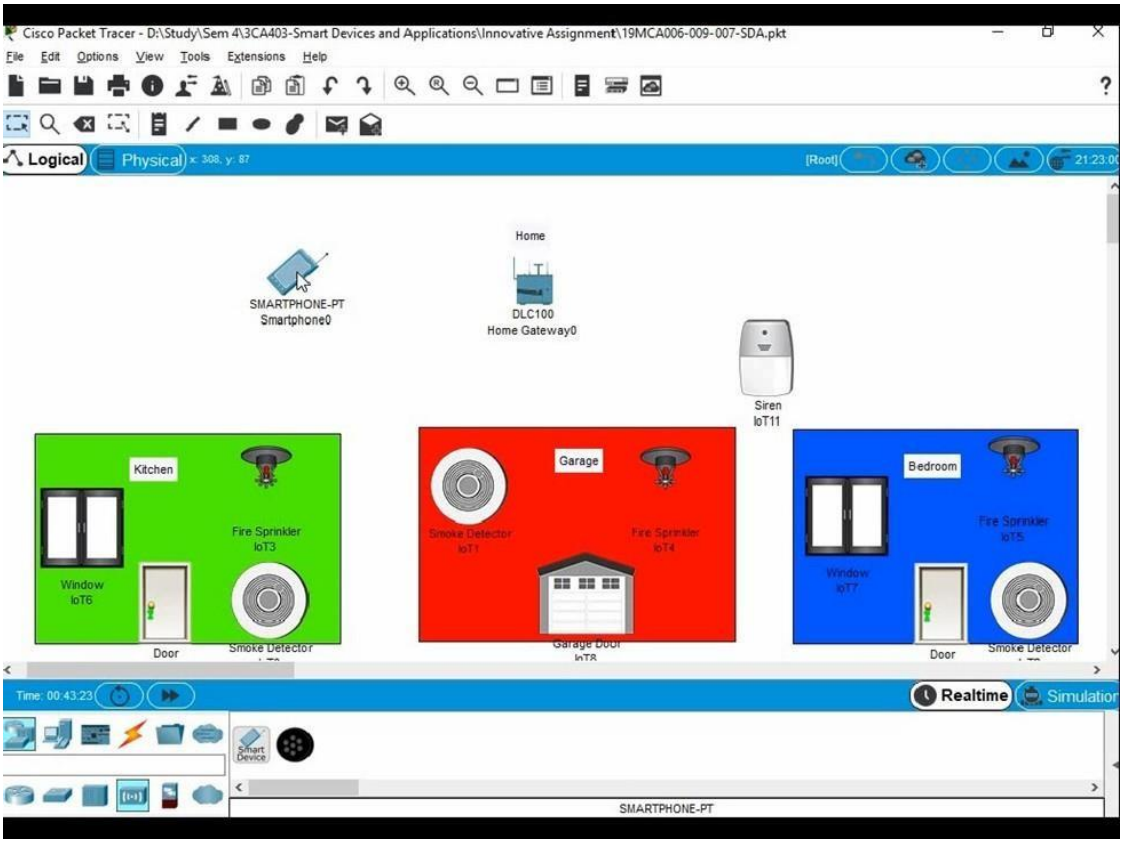
1) Smoke detectors: Afire-protection device that automatically detects and gives a warning of the presence of smoke.
2) Fire sprinkler: A fire sprinkler or sprinkler head is the component of a fire sprinkler system that discharges water when the effects of a fire have been detected, such as when a predetermined temperature has been exceeded
3) Windows
4) Doors
5) Garage door
6) Siren: These alarms may be activated automatically from smoke detectors and heat detectors or may also be activated via manual fire alarm activation devices.
7) Home Gateway: Home gateway are used to control the devices such as smart window, smart fan, smart garbage and sensor. The smart devices are connected to the IOT home gateway ports and smart phone is used to communicate with the smart devices.
8) Switch- The function of switch in an electric circuit is to either make or break the electric circuit. A switch is used to turn current to an electrical appliance either on or off.
9) Smart device- Smart devices are all of the everyday objects made intelligent with advanced compute, including AI and machine learning, and networked to form the internet of things (IoT).

IMPLEMENTATION

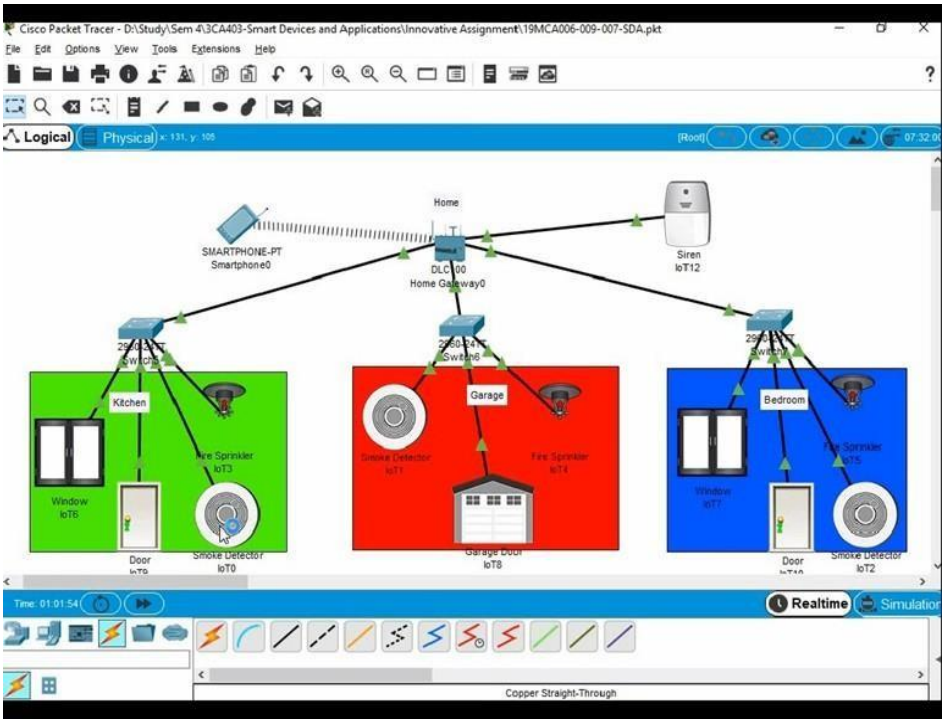
□ Create a House



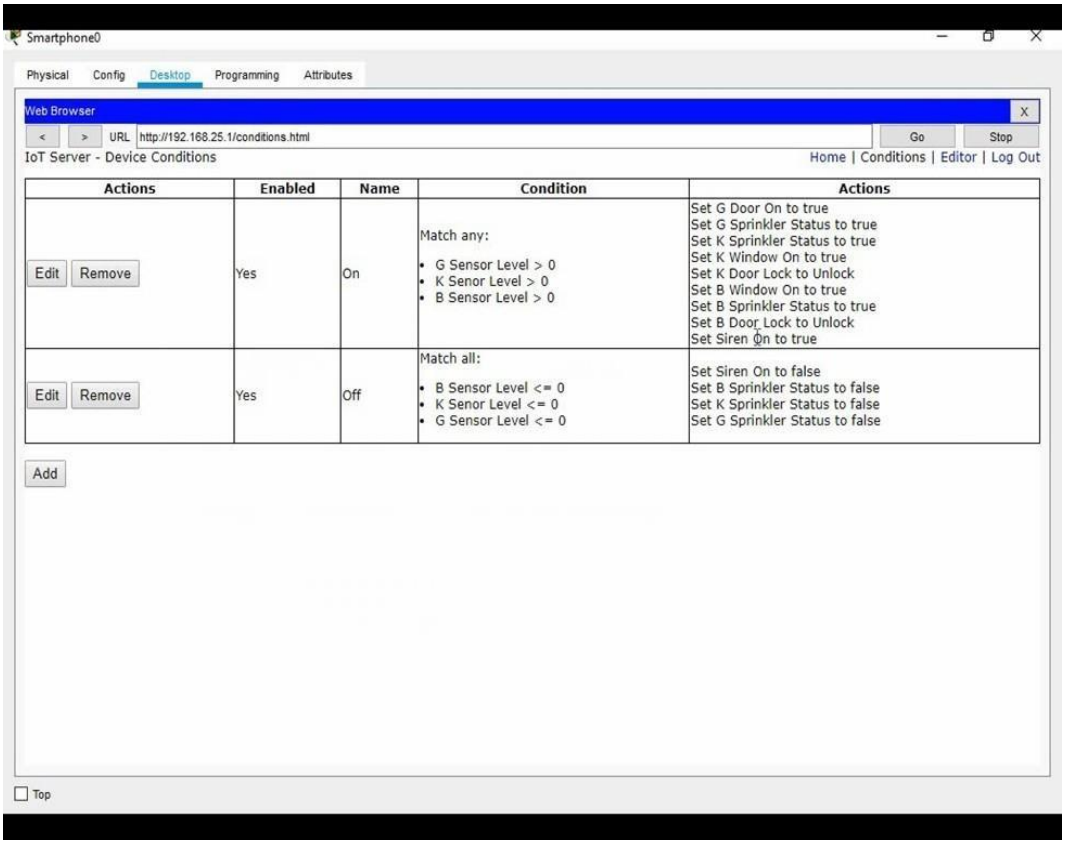
Place the devices in the house



Connect/configure all components with the home gateway



Write condition for automation of fire prevention



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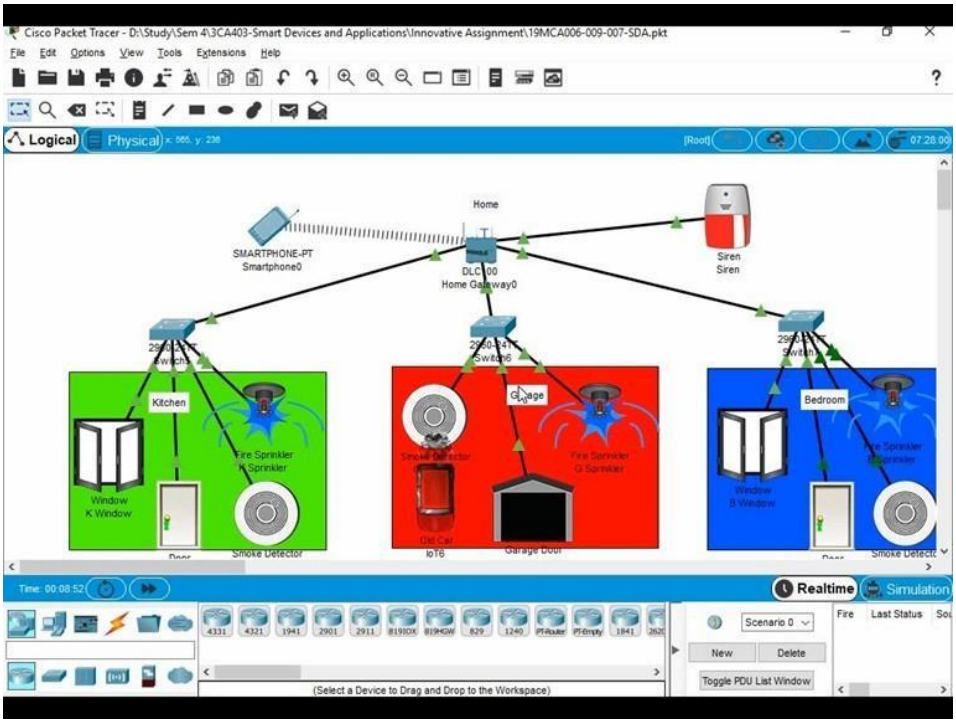

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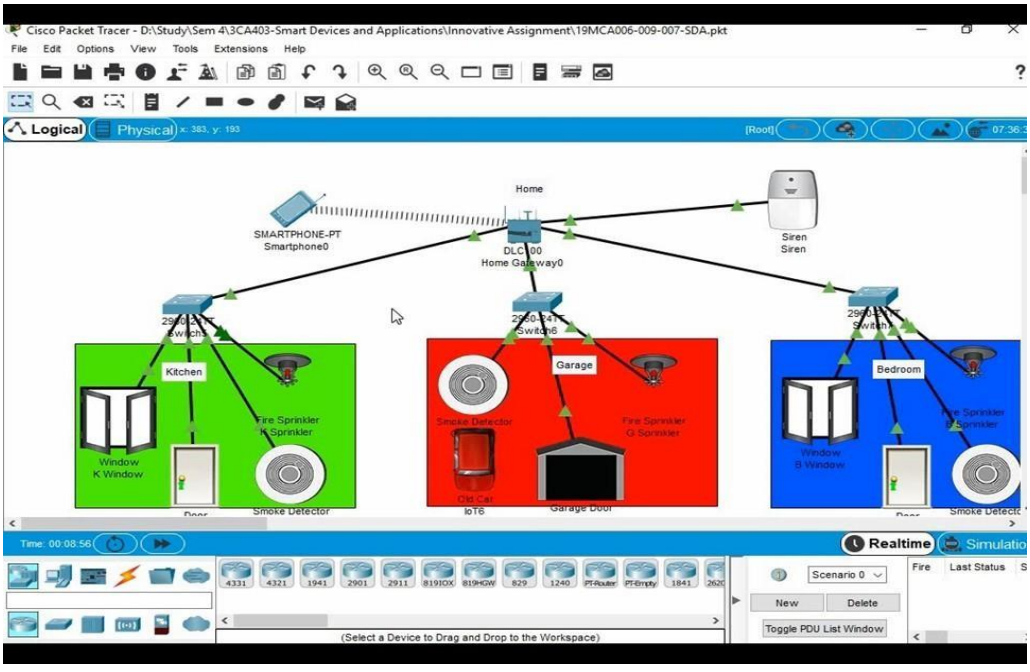

LITERATURE SURVEY

As discussed detection of fire is very crucial parameter in many fields of industrial area, forest area, etc. After many researches and study going on the smoke detection, some algorithms are specially designed for this purpose. These algorithms designed till now on fire detection through videos are, statistical colour model, and Dynamic Texture Analysis and no a day's optical mass flow estimators is getting attention. The Scientists Kosmas Dimitropoulos, Panagiotis Barmpoutis and Nikos Grammalid are focuses on different modelling algorithms used in flame detection. Also their advantages and disadvantages with respect to application over each other.

CONCLUSION

Though smoke detection system is quite a simple project but it has immense importance and necessity in our practical life. We programmed this device that is implemented and the value of the concentration of the smoke is given high so that normal smoking gas will not be the reason of the device alarm. We can also add some further improvement in this project. We are planning to use the dc water pump without servo directly with the Arduino for more reliable and fast response.You should install a smoke detector on each floor o a house. Always have a smoke detector and fire prevention system in your home for your safety. It will be beneficial when no one at home at a vacant place**.**Smoke detectors are great because they save lives.

There are smoke detectors formed as noses, to smell for smoke. There should be a minimum of two or three smoke detectors in your home. And also we want to add a GSM module here for sending sms tothe owner when smoke is detected.

REFERENCE:

1) https://community.cisco.com/t5/cisco-software-discussions/packet-acer-smoke-simulation-sensor-problem/td-p/4509065

2) https://github.com/karandoshi98

3) https://www.coursehero.com/file/73331750/SMOKE-DETECTION-ITH-FIRE-PREVENTION-USING-CISCO-PACKET-TRACERdocx/

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