

SMART FAULT DETECTOR IN POWER LINE USING IoT

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ABSTRACT

In the recent days the major problem caused by EB people are the transmission line faults due to external disturbance like nesting of birds, fallen of objects in the transmission line etc is very difficult for the EB peoples to identify the false manually moreover it may take a whole day for the Restoration for this issue we came up with the solution in our project we are going to predator the false in the transmission line due to the external disturbance with GPS location and monitoring the live status of the transmission line by using the quantum camera with the help of raspberry pi and GSM module. we can monitor the live status of the transmission line. Here we are using image processing technique for the live monitoring with the help of CN and technique for the power supply we are using solar panel and for the power storage where using battery when the external disturbance occurs in the transmission line it automatically since and allotting message with the particular location to the connected mobile device by using this method we can easily identify where the fault occurs and it is very helpful for the EB people to identify the location where the fault occurs.

1.INTRODUCTION

Nowadays demand of electricity increases and coverage of the power line is getting larger in spite of the continuous improvement of power grid this application helps to overcome this issue. Transmission lines are exposed without any shielding or protection. The same time transmission lines are character in places where the operation and maintenance are difficult such as deep mountains and high altitude areas with horse environment which brings huge challenges to the operation and maintenance of transmission line in how efficiently it detects the status of transmission line and ensures the normal operation of the grid system has become an important search in power system

Power transmission system affects from many unexpected failures due to various causes. This Faults are unpredicted and it requires high maintenance main function is to protect the system and detect the fault and the location where the fault occurs. In the recent days electric power has high demand enormous factors that affects the transmission of electric energy. The main reason is a fault occurs due to the external disturbance which other affected the overall performance and stability of the grid. Medicine to that there is a necessary need to support the future operation like real time monitoring and control of smart grid integration to overcome the issues we here created IOB based transmission line fault monitoring which detects the fall on objects on the transmission line before the objects fallen on to the air so this devices helps to take the safety measures as early as possible transmission lines get easily in chapter by the external disturbance which leads to the power loss time and cost of rectification is high the proposed system mainly aims to make the safety measures for transmission line this device monitors the live status of the transmission line under detects any external objects seen near to the transmission line message to the connected mobile device.

By using this project we can easily identify the external disturbance of the transmission line and also detect the location where the fault occurs so we can easily take early and measures to overcome the issue because the system predicts the process of high false and lying the images where the time and cost involved in the rectification has to be neglected . For operating the system we here by given solar panel for the power supply and for the power storage we hereby fixed a battery

2.PROPOSED SYSTEM

The system mainly works based on image processing technique this is the most effective way for monitoring the transmission line The main advantage of this project here we used iot based real time technology used for continuous monitoring of the transmission line if any falls occurs in the transmission

line it automatically since the emergency message a lot to the connected mobile device to the EB board all the status of transmission line is continuously monitor and updated to the EB board if any external disturbance occurs in the transmission line we get a mobile notification to the connector mobile device here we create an iot and GSM warrior based transmission line fault monitoring and detects the fallen objects on the transmission line before it causes falls so it is very helpful to take Precautions measures earlier for controlling this system we here by user raspberry pi and quantum camera for monitoring of live status of the transmission for the power supply we hear use an solar panel to operate the system.

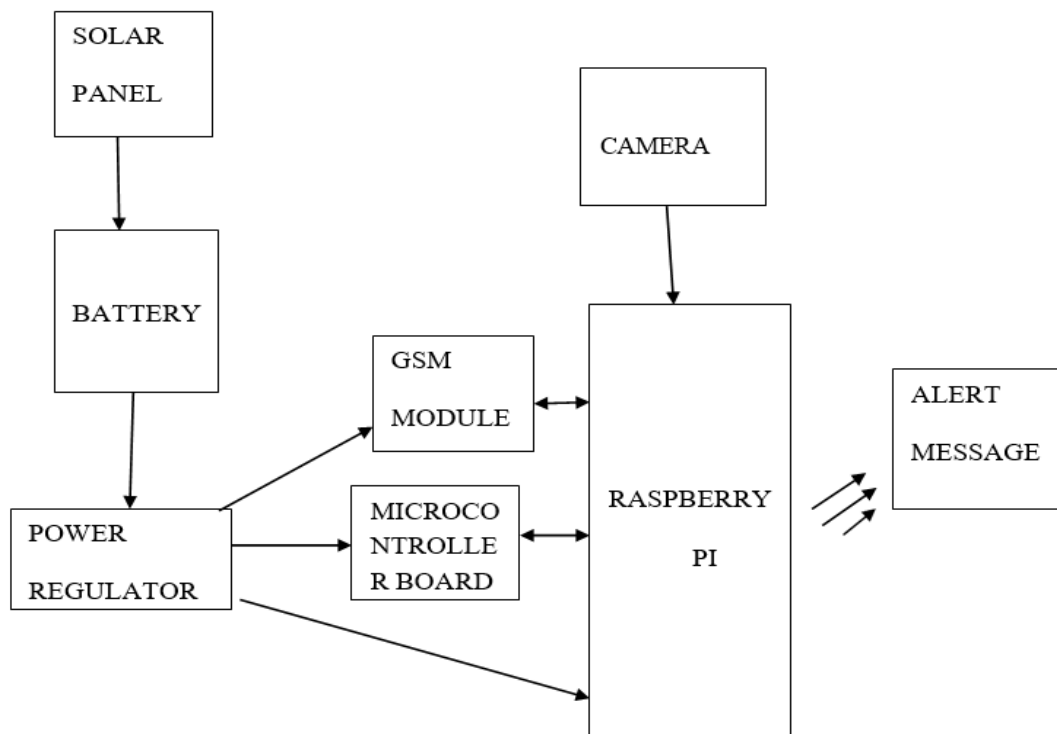


Fig:1BLOCK DIAGRAM

3.HARDWARE DESCRIPTION

Accessories

- Solarpanel
- Battery
- CameraQuantum5W
- PowerSupplyBoard
- Powerregulator
- MicrocontrollerBoard
- GSMModule
- Raspberrypi
- IoTTechnologies

4.SOLAR PANEL

For the renewable energy available, the Sun is Solar panel is an device which can be used to convert solar energy into electrical energy through Photovoltaic panel (PV) or mirror. It is a purest form of energy can be used to generate electricity or be stored in batteries or thermal storage.



FIG: 2.SOLAR PANEL

5.BATTERY

Batteries are a critical component of many modern technologies and are essential for storing and using energy efficiently. It converts chemical energy into electrical energy. Batteries are made up of cluster of electrochemical cells consists of cathode and anode. When a battery is connected to an electric circuit, chemical reaction takes place. It causes flow of electrons from anode to

cathode by means of producing electricity. Batteries are classified into many like lead-acid batteries, Li-ion batteries etc...

Fig:3. Battery



6.CAMERA QUANTUM

A quantum camera is just like a camera that works on the principle of quantum mechanics. It is used to detect and capture image also it captures information about the photons by themselves. In quantum camera, two entangled photons are sent in different directions with one is used to illuminate the object being captured and the other one is detected. These camera have such potential to use in the medical imaging, remote sensing and surveillance.

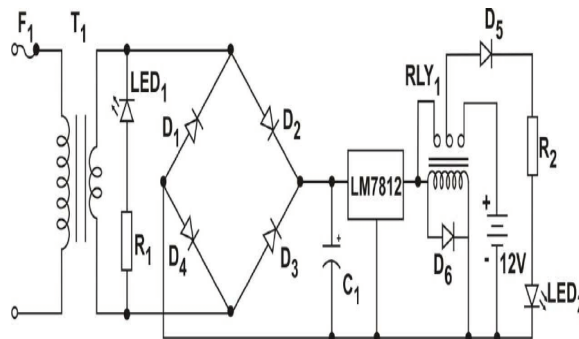
7.POWER SUPPLY BOARD

A power supply board is an electronic component that provides power supply to the computer or other electronic devices. The power supply boards are used for various protective measures like over voltage, over current and short circuit protection. This board consists of a step down transformer, rectifier, capacitors and regulators. The power supply can be varies depending on the size and capacity of the device. For huge devices, it requires huge or bulk power.

Fig:4.Quantumcamera



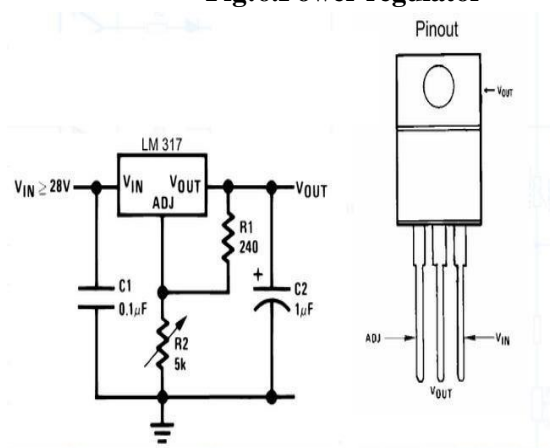
Fig:5.Power Supply Board



8.POWER REGULATOR

Power regulators are used to maintain a constant current and voltage. There are two types: linear and switching regulators. Linear regulators are less expensive but producing low efficiency. Hence it is used in low power applications. Whereas switching regulators are complex and expensive. It generates maximum efficiency, so it is used in high power applications like computers. Power regulators are used in small battery powered devices like mobile phones, laptops etc... and large industrial power plants and E-vehicles also.

Fig:6.Power regulator



9.MICROCONTROLLER BOARD

A microcontroller board or development board or a circuit board that contains microcontroller chip that allows to be programmed. Microcontrollers are very small, designed to perform tasks which are commonly used in embedded systems. These boards are typically used in power supply circuitry, USB port for programming and communication with a computer.

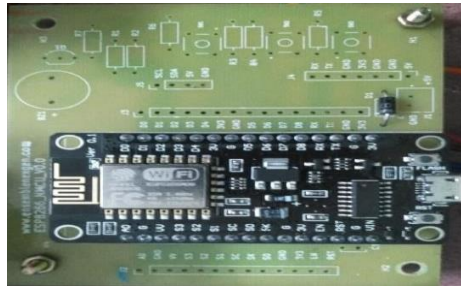


Fig:7.Microcontroller Board

10.GSM MODULE

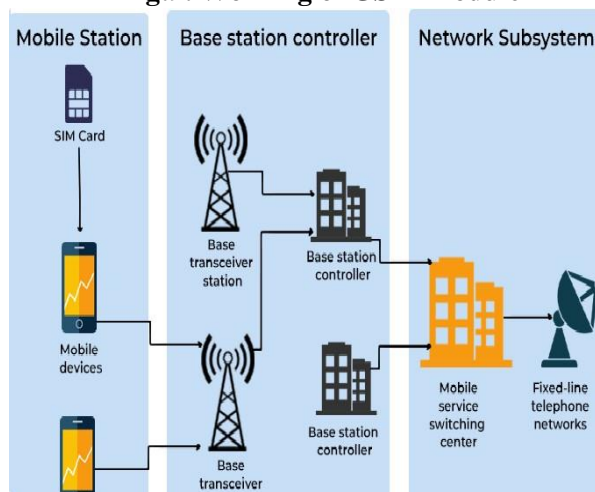
A GSM (Global System for Mobile Communication) is an electronic device that enables communication using the cellular network. This module includes a radio transceiver, antenna and other circuitry for processing signals.



Fig:8.GSM module

As shown in figure, GSM modules are used for sending and receiving SMS messages, monitoring and controlling systems as well as GPS tracking systems

Fig:9. Working of GSM Module



11.RASPBERRY PI

The Raspberry pi is a low cost, credit card sized computer that plugs into a monitor and uses a standard keyboard and mouse. It's a series of small single board computers developed in the UK by the Raspberry Pi foundation to promote the basic science in schools and growing countries. It is capable of running variety of Operating Systems including linux and windows 10 and it can be used for various kinds of projects like simple desktop to create a media center and controlling robots etc... The raspberry Pi is a Debit card sized low cost computer that connects to a computer desktop or TV and uses a standard mouse and keyboard it has a dedicated processor , memory and a graphics driver just like a PC.



Fig:10.Raspberry Pi

12.IOT TECHNOLOGY

IoT technology is a system works through real-time collection and exchange of data .it is an technology used anywhere in this advanced world. Without the use of IoT technology the advancement is not possible. Internet of things describes physical objects with sensors, software, processing ability, and many other technologies that connects and exchange data with other devices or systems.



Fig:11. IoT technology

13.RESULT

The power supply to the controller board is given by the solar panels. The amount of energy absorbed is stored in the battery which is used for continuous power supply. power regulator is used to regulate the amount of power supplied to the components. It is connected to the microcontroller board, GSM Module. The quantum camera is used for the live monitoring of the transmission lines. Raspberry pi is the main components which helps for the image proccession system which in-turn helps to detect the fault in the transmission lines. Microcontroller board is used to control the activities of the entire system. GSM Module is used to get the alerting message and to detect the location to the connected system.

Any disturbance is noticed, automatically we get the alerting message and the location to the connected system.In case of fault occurrence is noticed in terms of image processing technique which compares the with and without disturbance images which is already pre-modeled in the system.

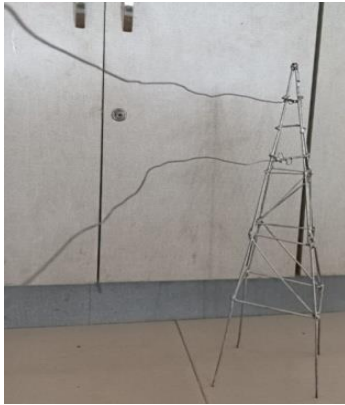


FIG :12. TRANSMISSION LINE WITHOUT DISTURBANCE



FIG: 13.TRANSMISSION LINE WITH DISTURBANCE

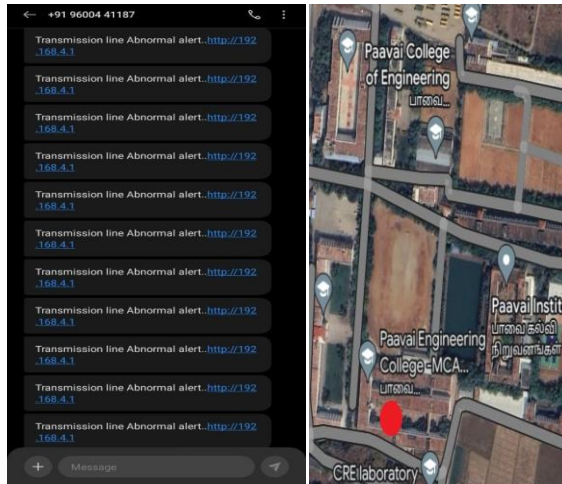


FIG:14. ALERTING MESSAGE AND LOCATION OF THE FAULT AS OUTPUT

FIG: 15.PROJECT SETUP IN TRANSMISSION POLE



CONCLUSION

This method is easy to implement and fast in execution compared to other methods. Accuracy is moderate. Accuracy can be increased by adding more statistical features and using other advanced classifier. But due to this complexity of algorithm will increase and it will slow down the execution speed. So this method gives the optimum solution in between speed of recognition and accuracy. By this project we can easily detect the fallen of the object before the fault occurs and we can easily detect the location of the fault occurred in the message notification in the connected mobile phones.

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