Automatic Street Light Fault Detection

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OBJECTIVE

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To develop an automated system for real-time street light fault detection, precise location tracking, and efficient maintenance in cities to enhance urban lighting infrastructure.

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ABSTRACT

"LightSense" aims to revolutionize urban lighting infrastructure by introducing an automated system for real-time street light fault detection, precise location tracking, and efficient maintenance. The current reliance on public reports or periodic surveys is time-consuming and inefficient. The project suggests a cost-effective solution utilizing Light Dependent Resistor (LDR) sensors integrated into an inexpensive board connected to a Modular Network Module for detecting changes in light intensity or the absence of light. The collected information, including a unique identification number for each street light pole, is transmitted to a regional hub and then relayed to the nearest Electricity Board (EB) Office mainframe for precise location determination and technician dispatch. The system goes beyond fault detection, providing a versatile framework for future enhancements. The project's workplan includes milestones, and the college facilities available for prototype development are essential. Industry support is sought, and financial assistance is required. The expected outcomes include faster response times, reduced costs, and overall improved urban lighting infrastructure.

PROBLEM STATEMENT

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How the information of Damaged/Faulty Street Lights is passed to the EB office and subsequently The Technician. The Faults are either reported by the public who happen to notice it and take initiative to report it or by periodic survey of the street by the Technician who would then repair or replace it. The issues of both ways are obvious: The Former is heavily unreliable and is hard to prioritize among huge number of reports, while the later is extremely inefficient taking days or even months to complete but was only followed as there is no alternative to this. It is clear that this part of the pipeline can be optimized. A solution is to use wide scale IoT technologies to detect and report the faults in matter of seconds.

PROPOSED SOLUTION

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Our Project uses an LDR Sensor to detect the reduction of intensity or absence of Light, The Sensor would be connected to an inexpensive board that transmits the information through an Modular Network Module which uses an GSM module or any networking technology appropriate to an regional hub which encompasses an radius of several kilometers. The information Consists of the unique identification number given to the street light along with any telemetry we need from the pole. The Hub then relays the information to an nearest EB Office mainframe which would resolve the Unique ID to the location of the same and dispatch or alert a Technician for an repair.

SYSTEM SPECIFICATION

HARDWARE USED :

Light Dependent Resistor

Arduino UNO

GSM Module

SOFTWARE USED :

WokWi (Online Arduino Emulator)

Micropython

MQTT (Hive MQ)

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THANK YOU