Smart and Green Street Lighting System based on arduino and RF wireless module

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ABSTRACT

Street lights consume a huge amount of electric energy due to their conventional control systems that automatically turn ON and OFF either using timers or light dependent resistor (LDR). In addition, such systems use a high power pulps, which is not a good option for energy saving, thus it causes a huge waste of energy in the whole world. Green and Smart Street Lighting System, is necessity to overcome such issues, especially with the emergence of Smart City. Therefore, this project aims to design a smart and green street lighting system (SGStreet-LS) for saving energy and utilizing renewable energy sources efficiently. The proposed system composes powerful ideas and concept to smoothly and efficiently control the operation of street lightings based on the sunlight availability and the motion detection by exploiting Arduino-based controllers with RF wireless communication support. It also utilizes low power LEDs that supplied from solar panels to replace the conventional high power lights. Also a part of this project is to study the relationship of energy and environment based on the emission of CO_2 level in the experiment, and validate the compatibility of real implementation of SGStreet-LS. In order to switching lights ON, there are to conditions to be satisfied: LDR sensor detects lower level of lights intensity (darkness situations), and PIR motion sensor detects the presence of an object in the street (vehicle/human). Otherwise, the street's lights will be switched OFF. As a result, by implementing SGStreet-LS, the electricity consumption for the street's lights can be reduced in addition to lowering CO_2 level by using renewable energy sources. The lights turn on before pedestrians and vehicles come and turn off or reduce brightness when there is no one.

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