Smart Electricity Meter Monitoring and Prediction using I-Socket

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Abstract*: As the world's population and energy needs continue to grow, the demand for power is ever-increasing. This has put a strain on natural resources and renewable sources of power, which are not yet developed enough to operate self-sufficiently. In this context, optimal power sharing and efficient energy consumption is essential. To this end, a smart electricity meter monitoring and prediction system has been developed using i-Socket, a hardware module that tracks the energy consumed by each device in a house and estimates the monthly electricity bill. This system notifies the user when the bill surpasses a set limit and sets the monitoring rate of a connected device to the socket based on the type of device, making it an energy efficient system. Current sensor used is the ACS712 sensor and the microcontroller is Arduino UNO. A Boost converter is used for the power supply and the software application is developed for monitoring electricity bills. This system takes input of present data of current and predicts the meter reading for the following months. However, the same can also be achieved by using a python server for holding an ML model that will be developed to predict future price of the bill based on the current usage of power. This is acts as an affordable alternative to that by using the iSocket.*

Keywords: ACS712 sensor, Arduino UNO, i-Socket, Boost converter, Current sensor, python server, ML model

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