**Nosferatu**

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**Abstract**

Nosferatu improves the lives of its users by adding convenience and removing annoyances from their daily routines. At times it can be inconvenient or even dangerous to stumble around in the dark looking for a light switch. Accidentally leaving the lights on when leaving the house leads to a more expensive electricity bill while leaving them off while on vacation can make the home seem abandoned and a target for burglars. Current wireless light bulbs are expensive and eventually need to be replaced. Nosferatu will replace a basic light switch with its own self-contained unit that will add improved functionality without needing to replace each individual bulb. This unit adds a motion sensor as well as remote control through a web interface. The motion sensor allows a user to turn on a light simply by walking into a room while the web interface allows them to turn their lights on or off from anywhere. The web interface allows the user to turn off their lights from bed before going to sleep or turn them on after waking up. While the user is out and wonders whether or not they remembered to turn off their lights they are able to check the status on the page and turn them off if needed. A user can also turn them on if they are not going to be home and want a light on to prevent their home from appearing empty. The web interface also allows a user to schedule times for their lights to turn on or off.

Each of the nodes is a NodeMCU board with a built in ESP Wireless Chip that can act as both an Access Point and Station, if the node has no active connection it will broadcast otherwise it will connect to the station. While broadcasting the node will just host a web page for a user to enter the SSID and Password of the station, which will then be used to connect and stop broadcasting. After the node connects to the station, the user is able to search for all nodes on their network and name them to better identify them later. From there the user is able to add rules to individual nodes. These rules can be set to change the status of a node automatically at a specified time. On the page the user is also able to disable motion control on an individual node. There is also a button on the node allowing manual control of the node’s status. Manual control of the node from the button or the web interface will automatically disable motion control for the node to prevent motion control from contradicting the user’s intentions.

In order to test Nosferatu, the team created multiple test circuits and connected one full circuit that would be found in a typical node to a desk lamp. A server was hosted locally on a Raspberry Pi. With this setup it was possible to easily test the motion controls as well as the button and control from the web interface. Testing of these features was met with success. Due to time constraints the Nosferatu team was unable to create a 3D printed case to house the circuit. Due to safety and time limitations the prototype was also not put to test in an actual home lighting scenario where the node is replacing a light switch.