

Where RU? Energy Conservation by Visualization
Group 40
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Abstract

The purpose of this project is to deploy a sensor network to obtain human occupancy data of an enclosed space and lay the groundwork for an algorithm to control the lighting for energy conservation. The idea is to create a smart space that is able to determine where the occupants are located inside a room and be able to “pinpoint” the lighting to ensure maximum efficiency for energy and lighting purposes. Currently, most commercial buildings statically light their rooms at the same levels throughout the day. With our solution we would be able to dynamically light rooms, where only portions that are occupied by people need to be illuminated, whereas the unoccupied portions may remain dark. Our group hypothesizes that the savings in power will be substantial.

Our research will be conducted in CORE Room 538 on the Livingston Campus of Rutgers University. The project will consist of two parts. The first part will be the method of collecting live data concerning the occupancy rate and positioning of people in the auditorium. The second part will be to analyze the data and implement an algorithm that adjusts the lighting of the auditorium using the Lutron lighting control system.

To conduct the data collection portion of this project, we will be working with sensors arranged in a grid-like matrix. Each square in our grid should be defaulted to inactive. When a sensor detects human presence in a certain square, that grid will be considered active. The resulting data will feed to the algorithm which will appropriately adjust the lighting. When a square is no longer occupied, the algorithm will adjust the lighting as the area.

In the conclusion of our project, we would like to illustrate the possible savings in power specific to the Lucy Stone Auditorium. Our eventual goal is to provide evidence that this type of dynamic lighting that utilizes Lutron’s dynamic lighting control system is more efficient to implement across many more lecture halls at Rutgers University and other large rooms in general.