



Assiut University
Faculty of Computers & Information



Smart Classroom

PROJECT PROPOSAL

GRADUATION PROJECT
ACADEMIC YEAR 2022-2023

Smart Classroom

Project Proposal

Project Team

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2022

Table of Contents

| | |
|---|-----------------|
| <i>Project Abstract.....</i> | <i>3</i> |
| <i>Project Objectives.....</i> | <i>3</i> |
| <i>Approaches and Methodology.....</i> | <i>4</i> |
| <i>Project Plan and Management</i> | <i>4</i> |
| <i>References.....</i> | <i>5</i> |

Project Abstract

Universities use a dramatically large amount of energy, and quite a lot of this is unnecessarily wasted. This means that education facilities are spending a lot of their allocated budget on energy, despite potentially not using all that they are paying for, and as budgets are becoming more and more limited, saving energy through minimizing running costs and power wastage in universities, is a method that can come in very useful.

Electricity saving can be achieved through the efficient use of energy, such as turning off lights, fans, air conditioning, and other electrical appliance when not in use. This project aims to prevent wasting Electricity in the classroom by implementing a tiny machine learning system that will detect and count the number of students entering and exiting the classroom using a sensor system and cameras, and Based on this information, the system will decide whether to turn on the electrical devices or not

The system will reduce the consumed energy, cost, and human resources by automating the process of lighting and ventilation.

Project Objectives

Reduce the energy consumed in classrooms by automating the process of lighting and ventilation. This system will save up to 20% more power. It will also reduce the cost and human resources wasted. Since universities use a dramatically large amount of energy, this system will improve the current systems and save more resources. The system will be running by July 2023. To achieve such goals, we propose the following objectives:

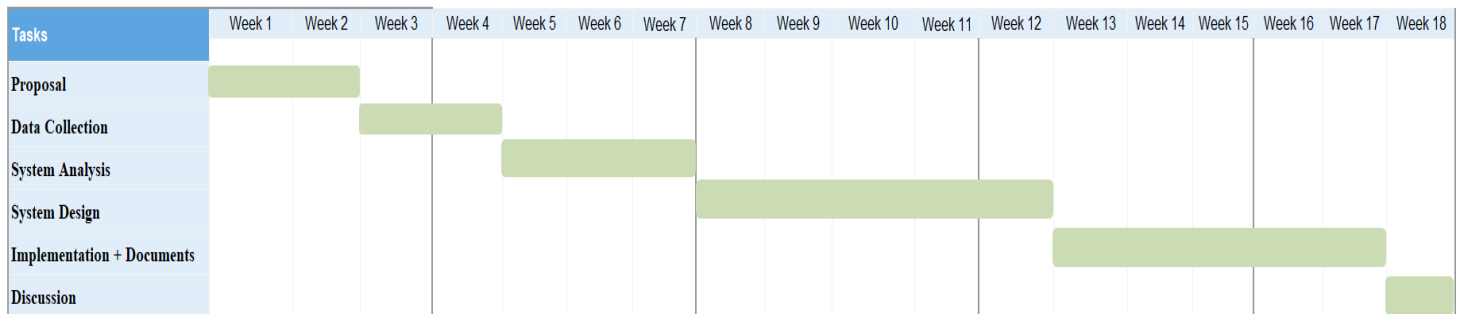
- 1. Design data collection models for the sensor resources.*
- 2. Design machine learning models to detect humans and their position.*
- 3. Develop smart systems for classroom power control.*

Approaches and Methodology

- Use sensors to detect any motion in the classroom.
- Gathering data with cameras
- Use a microcontroller/microprocessor to control the electrical devices.
- Pre-processing the collected data to remove any noise.
- Applying machine learning algorithms to detect humans and their position.
- Adjust the power consumption based on the position of the humans.

Project Plan and Management

First Term



| Task | Team Members |
|-----------------------------------|--|
| Project Proposal | All team members |
| Data Collection | Nourhan Mahmoud, Manar Mohamed |
| System Analysis | Mostafa Usama, Mohamed Nabil |
| System Design | Mohamed Ramadan, Manar Mohamed, Nourhan Mahmoud |
| Implementation + Documents | Mostafa Usama, Mohamed Nabil, Sondos Osama |
| Discussion | All team members |

Second Term

| Tasks | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 | Week 13 | Week 14 | Week 15 | Week 16 | Week 17 | Week 18 |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| System Design | | | | | | | | | | | | | | | | | | |
| Implementation | | | | | | | | | | | | | | | | | | |
| Testing | | | | | | | | | | | | | | | | | | |
| Maintenance | | | | | | | | | | | | | | | | | | |
| Report | | | | | | | | | | | | | | | | | | |
| Discussion | | | | | | | | | | | | | | | | | | |

| Task | Team Members |
|-----------------------|--|
| System Design | Mohamed Ramadan, Manar Mohamed, Nourhan Mahmoud |
| Implementation | Mostafa Usama, Mohamed Nabil, Sondos Osama |
| Testing | Nourhan Mahmoud, Mohamed Ramadan |
| Maintenance | All team members |
| Report | All team members |
| Discussion | All team members |

References

[1] (Mohd Wafi Nasrudin, Mohd Ilman Jais, Iszaidy Ismail, Nur Asyikin Nordin, & Amir Nazren Abdul Rahim, *Journal of Physics: Conference Series* 2107 (2021) 012019)

[2] (Yunhao Liu; Zhiwen Yu; Bin Guo; Lina Yao; Dalin Zhang; Kaixuan Chen, *ACM Computing Surveys* Volume 54 Issue 4 May 2022 Article No.: 77pp 1–40)