

**ECE Capstone Program**  
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**Project Abstract**

## **Data Center Reduction in Energy Consumption**

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**Keywords that Classify Project Scope:** Green Data Centers, Energy Efficiency, Effective Airflow Management, Green Metrics, Data Center Cooling.

### **Introduction**

In today's society, both the price of energy and the demand for data centers are increasing rapidly. However, many of these data centers are consuming more and more power each year. Although they are essential to providing cloud-computing services to different organizations, most of the energy that data centers require tends to get wasted. By not optimizing the cooling systems and power use effectiveness, the data centers are not being used to their full potential. The main objective of this project is to supply most of the energy to the IT equipment and minimize the consumption of energy in power distribution systems, specifically air conditioning.

### **Motivation and Goals**

It has been found that standard engineering equations are not sufficient to predict the efficiency of data centers because they return inaccurate results. The Data Center Reduction in Energy Consumption project overcomes this drawback because it utilizes machine-learning algorithms instead. These algorithms are designed to search for patterns in the data collected by the sensors implemented in the data centers. Thus, the machine-learning algorithms create models that are trained to comprehend the relationship between different parameters and the energy consumed by cooling. The models thus represent the identified patterns and make predictions of future over-consumption of energy. Through these predictions, data center operations will be optimized and more energy efficient because of the reduction in air conditioner usage and subsequent decrease in power.