Individual Project Proposal for INTELLIGENT SYSTEMS

October 23, 2024

1 Title:

Classification of Flame Extinction Using Machine Learning, Fuzzy Inference, and Deep Learning

2 Objectives

The goal of this project is to create a system that can predict whether a flame will be extinguished using data from sound wave tests. The dataset contains 17,442 tests where different fuels were used, with five fuel container sizes and 54 sound wave frequencies. The task is to predict flame extinction based on six input features. I will use machine learning, fuzzy logic, and deep learning techniques. In the end, I will combine fuzzy logic with deep learning to improve accuracy.

3 Requirements

This project will include several parts:

- Machine learning models - Logistic regression, Random forests and Support Vector Machines.
- Fuzzy logic system.
- Deep learning model (MLP) will also be developed to learn complex patterns in the data.
- Hybrid model that combines fuzzy logic with deep learning.

4 Remarks

Combining fuzzy logic with deep learning should improve performance, especially with uncertain or noisy data. The performance of traditional machine learning models, fuzzy and deep learning approaches will be compared to see which method works best.