Fuzzy Logic versus simple Rules Based system for controlling an AI video game car

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# Introduction

## Overview

This project aims to evaluate the performance of a fuzzy logic system in solving a simple video-game oriented problem. To achieve this, an implementation of a fuzzy logic system that was written by this author was tested against a very simple control class which implements a rules-based solution to the same problem.

The aim is to prove if a more complex fuzzy inference system out-performs a more naive solution. The devised test is to drive a Kart around a lap of a track in the fastest time, while avoiding crashing into the walls of the track.

## Techniques

### Why

## Description of Solution

The solution implemented an example microgame developed by (Unity Technologies, 2021) which each AI controls. There is a [sensor](documentation/html/class_kart_sensor.html) class which

## Hypothesis

The hypothesis held is that the fuzzy system will outperform the rules based system in both time to complete the lap, and in the number of collisions.

# Background

## Fuzzy Logic

## Simple Rules Based System

# Methodology

## Experiment Overview

## Unity Setup and Integration

### Kart Controller

### Kart Sensor

## System Design Fuzzy Logic

## Code Implementation – Fuzzy System

## Code Implementation – Simple Rules Based System

# Results

Raw Data

Direct Comparison

Adjustments and Results

# Discussion

## Results Overveiw

## Causes

## Outliers and Adjustments

## Explanations of failures

# Conclusion

## Hypothesis

## Critical Analysis

# References

**There are no sources in the current document.**