

Fuzzy mice  
IT3709

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### **Abstract**

This paper is an introduction to an implementation of fuzzy logic coupled with a Qt based simulation. In this paper we will try to explain how our fuzzy logic work and how that is coupled with a mouse simulation to test out fuzzy rules.

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# 1 Introduction

Fuzzy logic is a type of logic where each value can take on a range of truth values. This type of logic deals with degrees of truth in the rules it forms, each expression in the language can take on many values and all rules might fire to some degree.

Fuzzy logic then is well suited for situations where we want to use expressions that a human might use. For example, in first order logic we can express things like "The car is traveling at a speed over 50km/h", this is all well and good, but in most regular conversations humans would not express them self like this. Instead humans would use a sentence like "The car is traveling quite fast". This sentence is hard to represent in first order logic since we have a couple of variables which does not have a single value. "Fast" is not something a computer can work with straight out of the box since "Fast" might be a range of values. This is where fuzzy logic comes in. In fuzzy logic we can explain "Fast" as a range of values and when asked if the car is traveling "fast" we can evaluate that to a degree of truth. The car might not be traveling that fast and so our rules might say that it is fast to a degree of "0.2".

In this project we have implemented fuzzy logic with the aim of controlling mice which are running around a designated area. We read in rules written in a special format [link to rule format](#) and then use those rules to control the mice with fuzzy logic.