# Fuzzy Automata
## VYPa presentation

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## Abstract

One of the feasible ways to further the research of language and automata theory is appropriately extending and/or modifying the definition of a finite automaton and observing the changes in its behaviour. In this talk, we present the concept of fuzzy finite automata as a special case and a proper superset of finite automata by extending the state-transition function as a fuzzy relation.

We provide a formal definition of fuzzy sets and fuzzy relations as a foundation for understanding the function of a fuzzy automaton and, based on this definition, we demonstrate the function of a (non)deterministic fuzzy automaton as a usable model of pattern recognition. We further demonstrate the ability of fuzzy automata to emulate the function of neural networks and learning automata, while discussing the limitations of doing so.

Finally, we provide the definition of fuzzy languages, fuzzy regular expressions, and fuzzy grammars, and we demonstrate their potential for fuzzy matching as used in most modern automatic completion engines.