CS 6110: AUTOMATA AND COMPUTABILITY THEORY

Course Description

Mathematical models for algorithmic processes, such as finite automata and Turing machines. Limitations of such models.

Course Syllabus

- **Finite-state machines**
  - Various models for finite-state machines
  - Applications to neural nets
  - Limitations of such models
- **Infinite machines**
  - Turing machines
  - Variations of the Turing machine model
  - Universal Turing machines
  - Unsolvability of the halting problem
  - Reducing one unsolvable problem to another
- **Other models of computation**
  - Primitive-recursive, total-recursive, and partial-recursive functions
  - Enumeration of partial-recursive functions
  - Other models as time permits
  - Equivalence of the models of computation

Course Requirements

Homework exercises will be assigned throughout the term.