

# Automated Theorem Proving

## Supervision

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## Description

Automated theorem proving (ATP) describes the proof of a mathematical theorem by a computer program. For this purpose, various paradigms and concepts of computer science, such as predicate logic or machine learning, are used. Finding a proof for a theorem is considered as the fine art of mathematics and the attempt to automate this process poses various challenges to researchers, be it the initial representation of the required knowledge, finding the appropriate proof principle or the traceability of a formal proof to a human readable text. This variety of questions results in a varied and lively field of research.

The goal of this NEidI is to gain insight into the world of ATP, understand the basic concepts behind it, and identify the current state of research.

Students are expected to familiarize themselves with an almost unknown subject area and to explore this area independently. Knowledge from the basic courses of their studies should be put into a different context within a new field of application. Furthermore, students should refresh and deepen their already acquired knowledge of scientific working methods within this module. Thus, this NEidI also serves as preparation for writing scientific theses, as well as the opportunity to practice presenting.

## Tasks

1. Familiarization with an unfamiliar subject area.
2. Systematic literature research
3. Design and elaboration of a survey on a selected topic
4. Presentation of the results of the survey

## Exam Performance

- During the semester: regular presentation of the intermediate results (approx. 10 minutes per person)
- End of semester:
  - Survey (10 pages) on selected topic.
  - Final presentation (30 minutes per person)

## Schedule

- regular meetings during the semester (announcement of dates at the first meeting **18.10.2021, 15:15**).
- Communication and organization via **Stud-IP event no. 23880 (Vorlesung)**
- A preparatory event for each assignment.
- Submission of the elaboration: middle/end of March