Topics in Automated Theorem Proving (236 714): SS 2018


Homepage 2018:  
Old Homepages: 2013/14 and 2015

Lecturer: Prof. J.A. Makowsky  
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Office hours: Thursdays after the Tirgul, and by appointment via e-mail.

Format of the course: 2 hours lecture + 1 hour tirgul  
Lecture: Thursday 9:30-11:30 (Starting March 22)  
Tirgul: Thursday 11:30-12:30 (starting March 29)  
Place: TBA

Course details:

Course outline: Automated theorem proving is used in various rather different ways.

- Universal formalisms are used in Artificial Intelligence and Databases to automatize deductive systems in general data and knowledge processing.
- Various SAT-solvers are used for computer-aided verification of various systems.
- Highly specialized formalisms are used in well structured applications such as computational geometry and other branches of computer aided mathematics.
- Proof assistants are used to verify complex systems including complex mathematical proofs such as the 4-color theorem or the proof of Kepler's conjecture.

We shall study these approaches in a certain depth.

Course goal:  
Exploring the achievements of automated theorem proving.  
Introducing topics for M.Sc. and Ph.D. theses.

Prerequisites: Logic for CS (234 293)

Course requirements:  
Four homework assignments or Projects or take home exam.

Literature:

- J. Harrison, Handbook of Practical Logic and Automated Reasoning, Cambridge University Press, 2009  
- A. Robinson and A. Voronkov, eds  
  Handbook of Automated Reasoning, vol. 1 and 2  
  The MIT Press and North Holland, 2001  
- B.F. Caviness and J.R. Johnson (eds), Quantifier Elimination and Cylindrical Algebraic Decomposition, Springer 1998  
- Recent papers of interest, to be posted when relevant.

Participants 2018