▶ STEFAN HETZL, JANNIK VIERLING, *Proof-theoretic analysis of automated inductive theorem proving.*

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Automating the search for proofs by induction is an imporant topic in computer science with a history that stretches back decades. A variety of different approaches and systems has been developed. Typically, these systems have been evaluated empirically and thus very little is known about their theoretical limitations.

In this talk I will present a proof-theoretic approach for understanding the power and limits of methods for automated inductive theorem proving. A central tool are translations of proof systems that are intended for automated proof search into (very) weak arithmetical theories. This allows not only to locate a method in a partial order of theories but also to provide examples for unprovable statements which are of practical interest in computer science.

This research gives rise to a number of new problems and questions about (very) weak aritmetical theories, mostly concerning unprovability results.

[1] STEFAN HETZL AND JANNIK VIERLING, *Induction and Skolemization in saturation theorem proving*, **Annals of Pure and Applied Logic**, 174(1):103167, 2023.

[2] STEFAN HETZL AND JANNIK VIERLING, *Unprovability results for clause set cycles*, **Theoretical Computer Science**, 935, pp. 21-46, 2022

[3] JANNIK VIERLING, **The limits of automated inductive theorem provers**, PhD thesis, TU Wien, Austria.