My Collaborations with Toniann Pitassi

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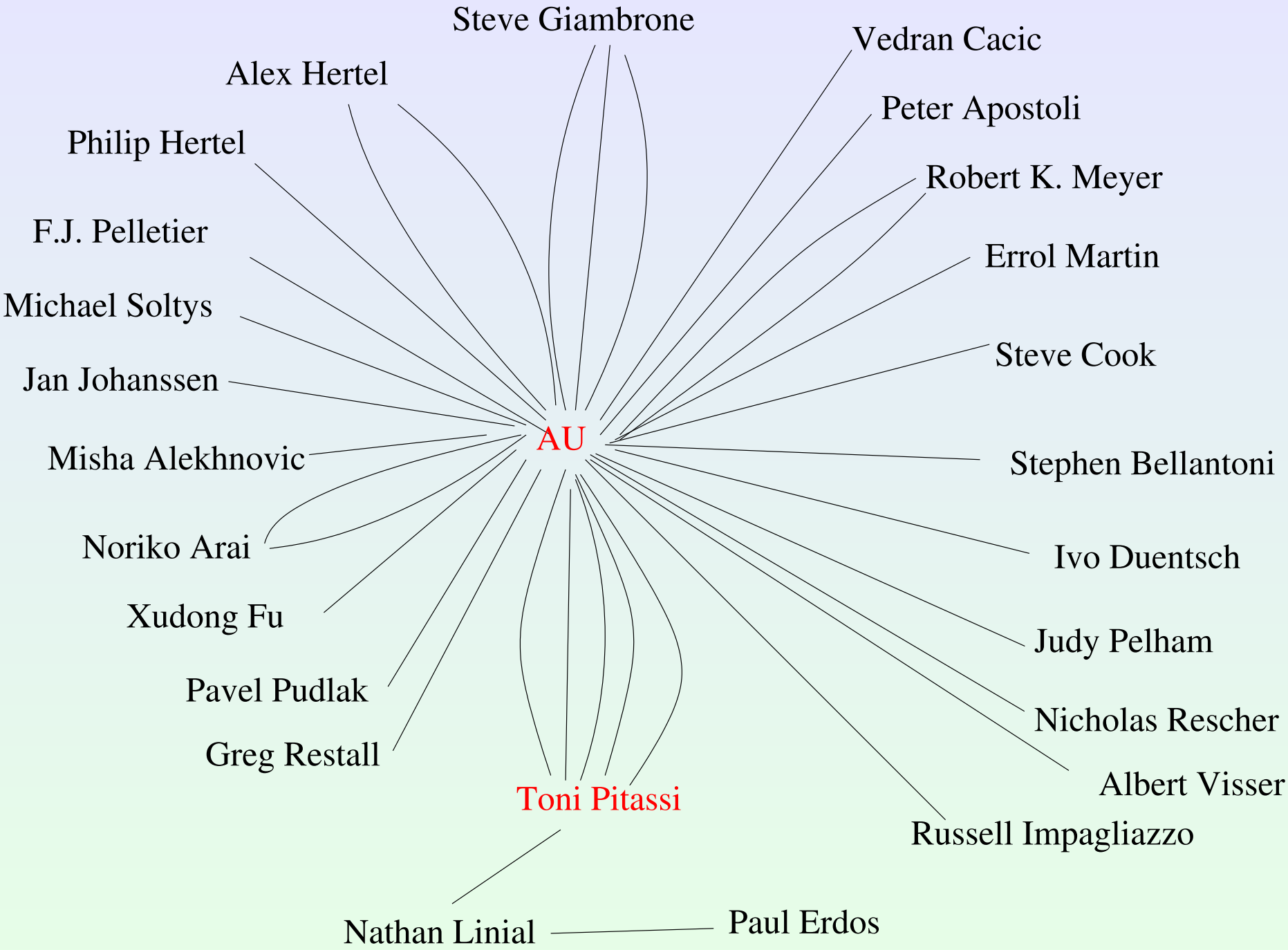
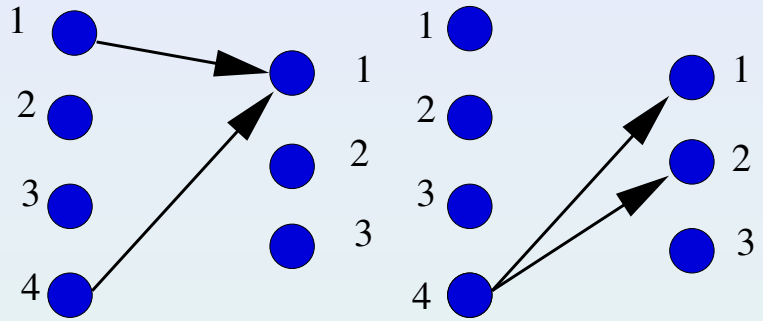

Steve Giambrone
Vedran Cacic
Alex Hertel
Peter Apostoli
Philip Hertel
Robert K. Meyer
F.J. Pelletier
Errol Martin
Michael Soltys
Steve Cook
Jan Johanssen
AU
Misha Alekhnovic
Stephen Bellantoni
Noriko Arai
Ivo Duentsch
Xudong Fu
Judy Pelham
Pavel Pudlak
Nicholas Rescher
Greg Restall
Albert Visser
Toni Pitassi
Russell Impagliazzo
Nathan Linial
Paul Erdos

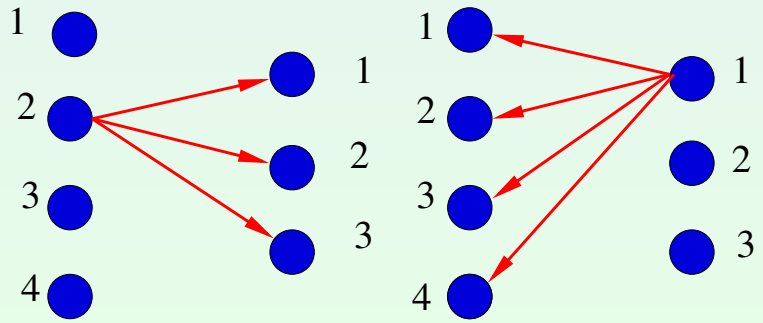
Toni Pitassi and Steve Bellantoni

The pigeonhole framework

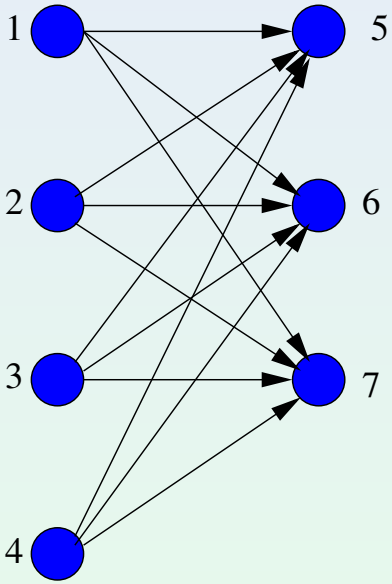
For the pigeonhole principle, we have $(\neg P_1^1 \vee \neg P_1^4) \ldots$ etc.

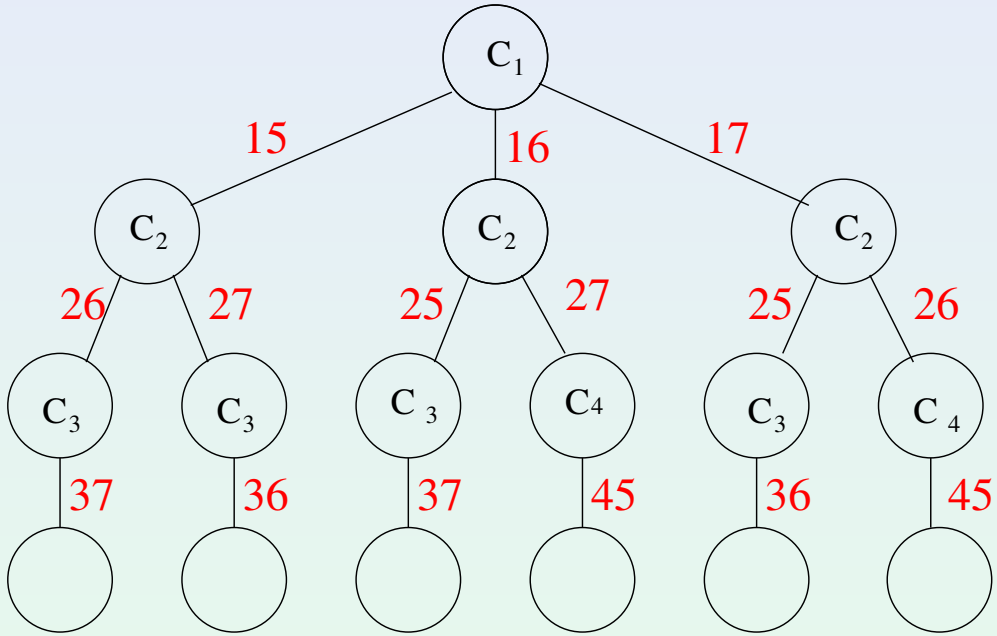


The assignments are the partial matchings between D and R.
The positive clauses are of the form $C_i = \bigvee\{P_j^i : j \in R\}$, and $C_j = \bigvee\{P_j^i : i \in D\}$.



A pigeonhole decision tree

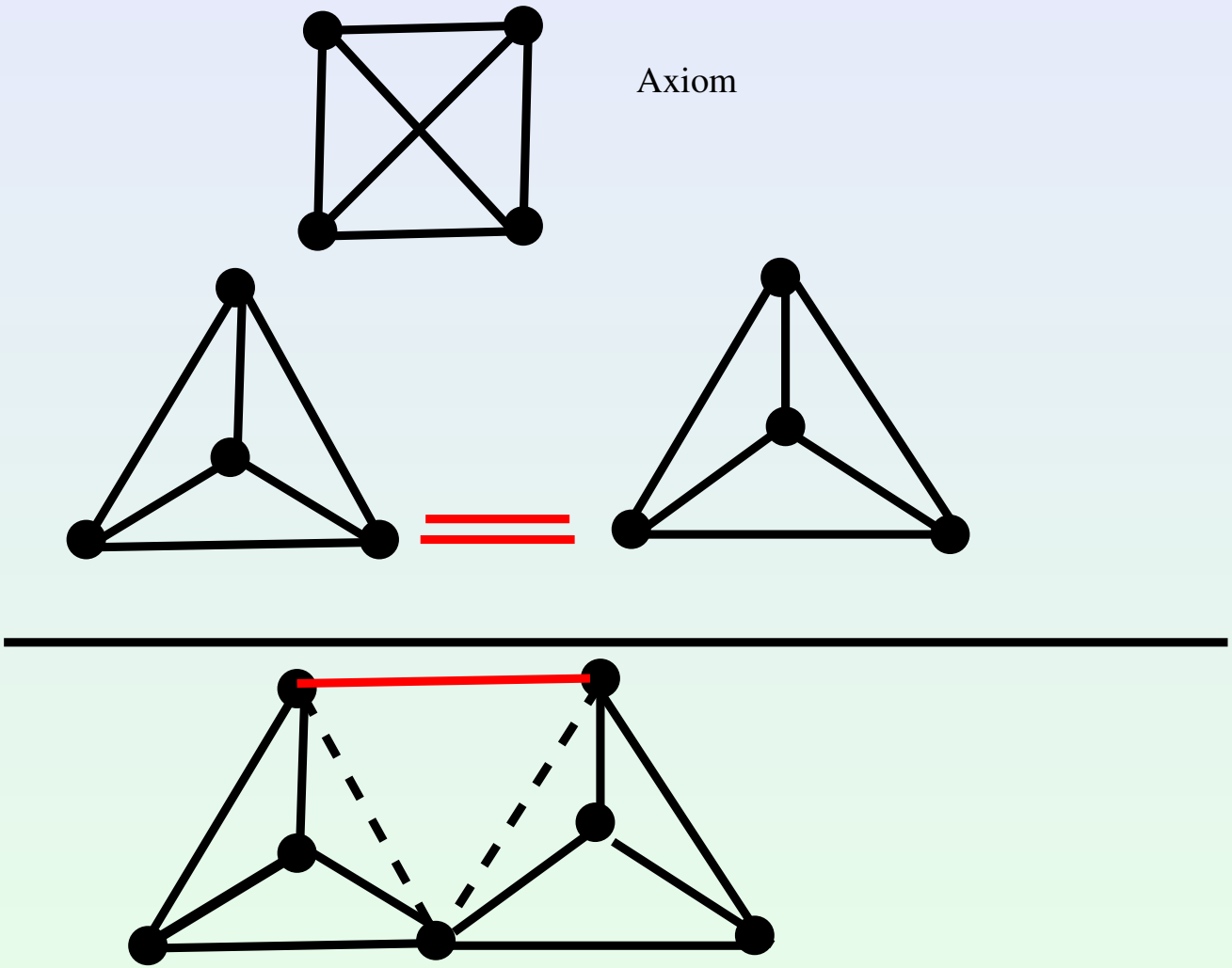




Second collaboration (with Toni and Russell)

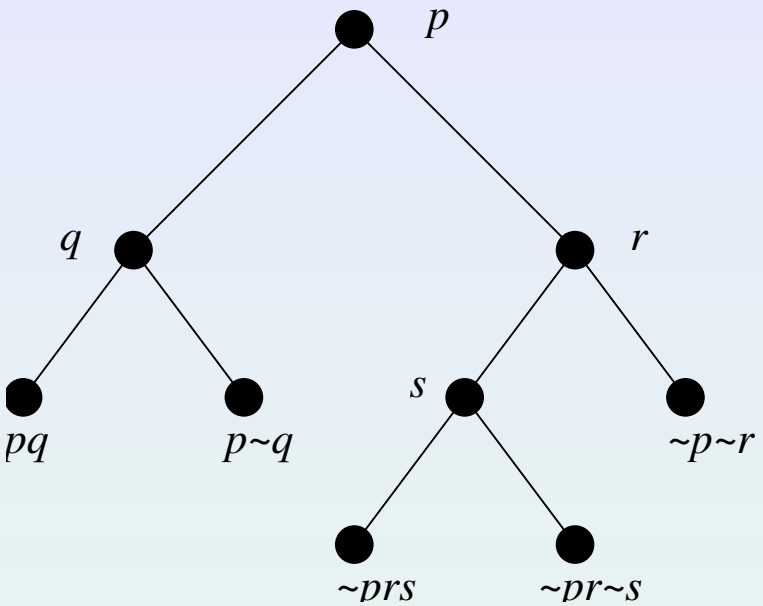
Upper and lower bounds for tree-like cutting plane proofs.

The Hajos calculus



Fourth collaboration (with Toni and Noriko Arai)

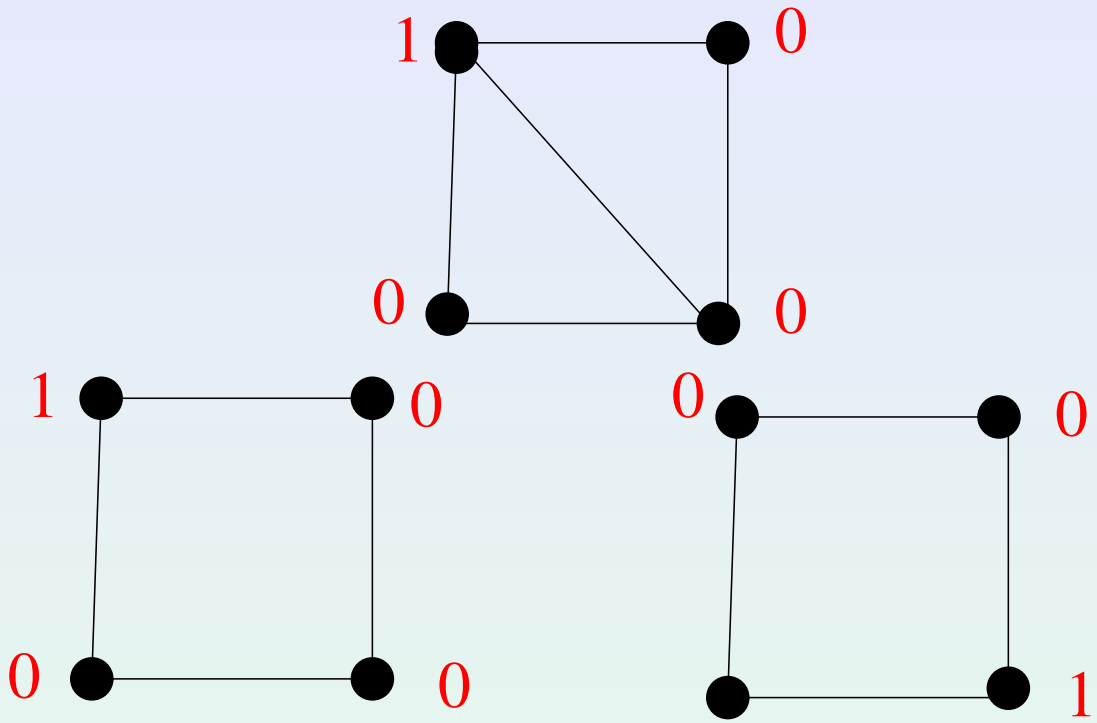
Complexity of analytic tableaux



These tree-based sets of clauses separate clausal tableaux from tree resolution. However, Fabio Massacci pointed out that if we formulate tableaux with binary decomposition, then we can get an exponential speedup. The paper with Toni and Noriko provides a nearly complete anaysis of the possibilities.

Fifth collaboration (with Jan Johannsen)

Exponential separation between regular and general resolution.



Representing resolution as an operation on labelled graphs.

Problem: Prove or disprove that regular refutations are minimal for the Tseitin clauses.