Faculty of Computer Science 2006-2007 Seminar Series

"Is there a Short Proof? Clause trees" and the question "Is Np = coNP?"

By

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The propositional logic problem SATISFIABILITY is central to much of theoretical computer science. A logic expression on a set of boolean variables is satisfiable if there is an assignment of true and false to the boolean variables that make the expression true. To prove that there is no such assignment requires a proof in propositional logic. If one could show that some such expression does not have a proof of polynomial size (ie. a small proof) in any proof system, then P 6= NP, solving one of the million dollar mathematical millennium questions.

I will show that if there is a small proof using extended resolution (one of the many polynomially equivalent strongest known proof systems) then there is a small tree-like proof. Tree-like resolution proofs are often much bigger than the equivalent smallest resolution proof, but it has been known for a long time that the smallest resolution proofs are exponential for many randomly chosen families of expressions.

All terms in the above abstract will be explained intuitively in the talk.

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STUDENTS ARE ENCOURAGED TO ATTEND

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