PRINCETON ACM / IEEE-CS CHAPTERS
JANUARY 2010 JOINT MEETING

The "P vs. NP" Problem: Efficient Computation, Internet Security, and the Limits to Human Knowledge

Avi Wigderson

Why does Computational Complexity Theory matter in the real world?

Good question. The human quest for efficiency is ancient and universal. Computational Complexity Theory, the mathematical study of the efficiency requirements of computational problems, is one way to make some important questions concrete and mathematical. There are some deep implications in complexity theory for understanding the most basic and general questions in science and technology.

In this talk, we will describe the "P versus NP question" of computer science. P versus NP was first defined in 1971 – it is a computational complexity problem that has remained unsolved for almost 40 years, even though there is a prize of $1 million for its solution. But – suppose we somehow learned the answer to this question? What would it mean? This talk will explain the consequences of its two possible resolutions, P = NP or P != NP, to the power and security of computing, the human quest for knowledge, and beyond.

The connection rests on formalizing the role of creativity in the discovery process. The question: "Can creativity be automated?" seems to be abstract and philosophical. But in mathematical form, it could be thought of as: "Does P = NP?" This question emerges as a central challenge of science. And the basic notions of space and time, studied as resources of efficient computation, are key objects of study for solving this mystery, just like their physical counterparts hold the key to understanding the laws of nature.

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Date:	Thursday, January 21, 2010, 8:00 pm.
	(Refreshments and networking at 7:30 pm.)
Place:	Small Auditorium, Room CS 105
	Computer Science Building, Princeton University
	Olden St. between William St. and Prospect Ave. +40.3502,–74.6522
Information:	Dennis Mancl (908) 582-7086, Jan Buzydlowski (610) 902-8343
On-line info:	**http://www.acm.org/chapters/princetonacm**

All ACM / IEEE-CS meetings are open to the public. Students and their parents are welcome. There is no admission charge, and refreshments are served.

A pre-meeting dinner with the speaker is held at 6:00 p.m. at Ruby Tuesday's Restaurant on Route 1. Please send email to **princetonacm@acm.org** in advance if you plan to attend the dinner.