DISTINGUISHED LECTURE SERIES

EECS COLLOQUIUM

Fall 2010

Wednesday
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4:00 - 5:00 pm

306 Soda Hall
Hewlett-Packard
Auditorium

Towards Universal Semantic Communication

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Abstract

Is it possible for two intelligent players to communicate meaningfully with each other, without any prior common background? What does it even mean for the two players to understand each other? We claim that this question, in addition to being of philosophical/ linguistic interest, goes to the essence of modern communication/computation.

In this talk, I will describe our approach towards this problem. We argue that in order to get to the heart of such questions, one must first articulate why intelligent players (and/or powerful computers) communicate. This leads us to a formal theory of "goals" of communication. We then show that when progress towards the goal is "verifiable" then players can detect misunderstandings. Under a complexity-theoretic lens, we show roughly that verifiability is really the essence of resolving misunderstandings: Verifiable goals are more powerful than goals that can be achieved without communication (so communication is good), but very restricted compared to "unverifiable" goals (so there is need for moderation). Most of the talk will focus on the definitions of various concepts such as "goals", "(mis)understanding" and resort to theorems based on computational complexity to support these definitions.

Based on joint works with Oded Goldreich (Weizmann) and Brendan Juba (MIT).

Biography

Madhu Sudan recently joined Microsoft Research at their New England Research Center as a Principal Researcher. He is currently on leave from MIT where he was the Fujitsu Professor of EECS. He received his Bachelors degree from IIT Delhi in 1987 and his Ph.D. from UC Berkeley in 1992. From 1992-1997 he was a Research Staff Member at IBM's Thomas J. Watson Research Center. He joined MIT in 1997 where among other roles he was an Associate Director of MIT's CSAIL from 2007-2009.

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