The descriptive complexity of the P vs NP-complete dichotomy.

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Abstract

Fagin equated non deterministic polynomial time with the existential fragment of second order logic (NP=ESO). With the provisio that P is different from NP, Ladner showed that there are problems which are neither very hard nor really tractable (neither NP-complete nor Ptime solvable). Feder and Vardi championed the study of a natural class of computational problems known as Constraint Satisfaction Problems which seem a contrario to Ladner's since they follow a dichotomy between tractable and hard (they are either Ptime solvable or NP-complete). The purpose of this talk is to discuss a logic for dichotomy that Feder and Vardi proposed and if times allows to discuss some personal current work in this area.

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