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MADALGO seminar by John Iacono, Polytechnic Institute of New York University

Blasting Transdichotomous Atomic Rambo

Suppose you have a fixed set of n numbers and you want to create a data structure that allows a fast search in this set. How fast can such a search be? Well it depends on what computer you have. But theoreticians don't have computers, instead we have models of computation. But what is a model of computation other than saying what things you can do in what amount of time? Being able to set the rules by which our algorithms are evaluated should make it easier to design fast algorithms. Traditionally, models of computation have had some relation to actual computers, but insisting on this relationship can result in slower algorithms than if one is unconstrained by reality. In particular, we discuss how non-standard, but plausible, CPU and memory designs can allow the design of asymptotically faster fundamental algorithms.