Buntrock, Gerhard; **Hemachandra, Lane A.**; **Siefkes, Dirk**

Using inductive counting to simulate nondeterministic computation. (English) Zbl 0747.68015

Mathematical foundations of computer science, Proc. 15th Symp., MFCS '90, Banská Bystrica/Czech. 1990, Lect. Notes Comput. Sci. 452, 187-194 (1990).

[For the entire collection see Zbl 0731.00026.]

This paper is a short version of a detailed forthcoming article of the same authors. A language L belongs to NSPACE-AMBIGUITY$[s(n), a(n)]$ if L is acceptable by a nondeterministic $s(n)$ space-bounded Turing machine the computation trees of which have $\leq a(n)$ computation paths leading from the start configuration to any configuration that appears in the trees. The constructability of a function will be understood as in *J. Balcázar*, *J. Díaz*, and *J. Gabarró* [Structural complexity, I. Springer-Verlag (1988; Zbl 0638.68040)]. The authors describe, in short, a new technique based on *N. Immerman* [SIAM Comput. 17(5), 935-938 (1988; Zbl 0668.68056)] and *R. Szelepcsényi* [Acta Inf. 26(3), 279-284 (1988; Zbl 0649.68055)]. The authors show that for all functions $s(n)$ and $a(n)$ if $a(n)$ is constructible so that $a(n) = O(2^{s(n)})$ and $s(n) \geq \log(n)$, then NSPACE-AMBIGUITY$[s(n), a(n)]$ is contained in the class of languages accepted by $s(n)$ a space bounded unique Turing machine.

Reviewer: G.B.Marandzhyan (Erevan)

MSC:

68Q15 Complexity classes (hierarchies, relations among complexity classes, etc.)
68Q10 Modes of computation (nondeterministic, parallel, interactive, probabilistic, etc.)

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Keywords:

computation trees; polynomial ambiguity