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Lower bounds on the size of bounded depth circuits over a complete basis with logical addition. (English. Russian original) Zbl 0632.94030

Math. Notes 41, 333-338 (1987); translation from Mat. Zametki 41, No. 4, 598-607 (1987).

Lower bounds for bounded depth circuits over $\{ \&, \vee, \oplus \}$ are given using a special structure of families of Boolean functions called regular models. The construction of bounded degree is described. These models are then used to deduce exponential lower bounds in the basis $\{ \&, \oplus \}$, and it is shown that they also hold in the basis $\{ \&, \vee, \oplus \}$.

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MSC:

94C10 Switching theory, application of Boolean algebra; Boolean functions (MSC2010)
68Q25 Analysis of algorithms and problem complexity

Keywords:

circuit complexity of Boolean functions; bounded depth circuits; regular models; exponential lower bounds

Full Text: DOI

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