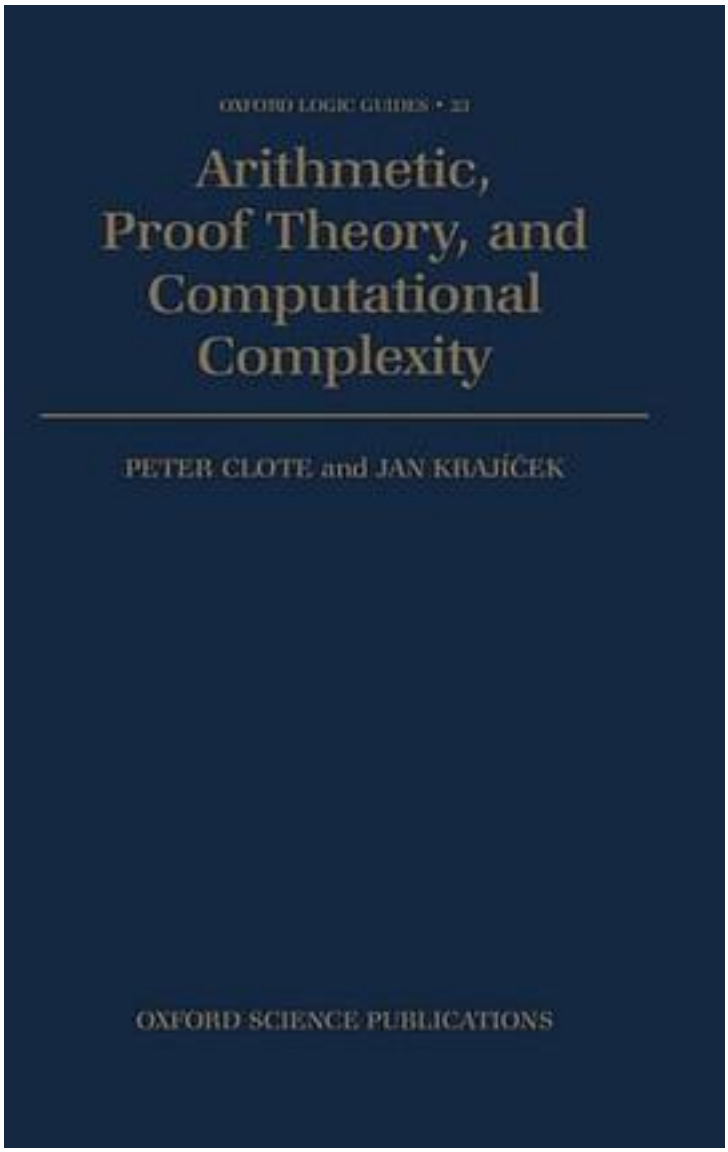
Arithmetic, Proof Theory, and Computational Complexity



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This book principally concerns the rapidly growing area of what might be termed "Logical Complexity Theory", the study of bounded arithmetic, propositional proof systems, length of proof, etc and relations to computational complexity theory. Issuing from a two-year NSF and Czech Academy of Sciences grant supporting a month-long workshop and 3-day conference in San Diego (1990) and Prague (1991), the book contains refereed articles concerning the existence of the most general unifier, a special case of Kreisel's conjecture on length-of-proof, propositional logic proof size, a new alternating logtime algorithm for boolean formula evaluation and relation to branching programs, interpretability between fragments of arithmetic, feasible interpretability, provability logic, open induction, Herbrand-type theorems, isomorphism between first and second order bounded arithmetics, forcing techniques in bounded arithmetic, ordinal arithmetic in *L *D o . Also included is an extended abstract of J P Ressayre's new approach concerning the model completeness of the theory of real closed expotential fields. Additional features of the book include (1) the transcription and translation of a recently discovered 1956 letter from K Godel to J von Neumann, asking about a polynomial time algorithm for the proof in k-symbols of predicate calculus formulas (equivalent to the P-NP question), (2) an OPEN PROBLEM LIST consisting of 7 fundamental and 39 technical questions contributed by many researchers, together with a bibliography of relevant references.

作者介绍:

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