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Pebble games, proof complexity, and time-space trade-offs. (English)

Summary: Pebble games were extensively studied in the 1970s and 1980s in a number of different contexts. The last decade has seen a revival of interest in pebble games coming from the field of proof complexity. Pebbling has proven to be a useful tool for studying resolution-based proof systems when comparing the strength of different subsystems, showing bounds on proof space, and establishing size-space trade-offs. This is a survey of research in proof complexity drawing on results and tools from pebbling, with a focus on proof space lower bounds and trade-offs between proof size and proof space.

MSC:
03F20 Complexity of proofs
03-02 Research exposition (monographs, survey articles) pertaining to mathematical logic and foundations

Keywords:
proof complexity; resolution; k-DNF resolution; polynomial calculus; PCR; cutting planes; separation; pebble games; pebbling formulas; SAT solving; DPLL; CDCL; survey paper; size-space trade-offs; proof space; proof size

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