Goldreich

Computational Complexity and Property Testing

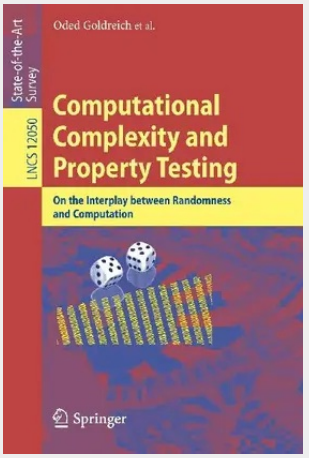
On the Interplay Between Randomness and Computation

This volume contains a collection of studies in the areas of complexity theory and property testing. The 21 pieces of scientific work included were conducted at different times, mostly during the last decade. Although most of these works have been cited in the literature, none of them was formally published before.

Within complexity theory the topics include constant-depth Boolean circuits, explicit construction of expander graphs, interactive proof systems, monotone formulae for majority, probabilistically checkable proofs (PCPs), pseudorandomness, worst-case to average-case reductions, and zero-knowledge proofs.

Within property testing the topics include distribution testing, linearity testing, lower bounds on the query complexity (of property testing), testing graph properties, and tolerant testing. A common theme in this collection is the interplay between randomness and computation.

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