

THE POWER AND WEAKNESS OF RANDOMNESS
(WHEN YOU ARE SHORT IN TIME)

Avi Wigderson

Institute for Advanced Studies

Man has grappled with the meaning and utility of randomness for centuries. Mathematicians, scientists and philosophers offered many viewpoints and applications. Research in the Theory of Computation in the past thirty years has enriched this study, and its contributions are the subject of my talk.

I will describe two main aspects of this research on randomness, demonstrating respectively its power and weakness for making algorithms faster. I will address the role of randomness in other computational setting, such as space bounded computation and probabilistic and zero-knowledge proofs. Formal computational notions of pseudorandomness, and the view of randomness as a computational resource play a key role in these developments.