

Exploring RANDOMNESS

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Chaitin, Gregory J.

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Monografía

This essential companion volume to CHAITIN's highly successful books The Unknowable and The Limits of Mathematics, also published by Springer, presents the technical core of his theory of program-size complexity, also known as algorithmic information theory. (The two previous volumes are more concerned with applications to meta-mathematics.) LISP is used to present the key algorithms and to enable computer users to interact with the author's proofs and discover for themselves how they work. The LISP code for this book is available at the author's Web site together with a Java applet LISP interpreter: http://www.cs.auckland.ac.nz/CDMTCS/chaitin/ait/ "No one has looked deeper and farther into the abyss of randomness and its role in mathematics than Greg Chaitin. This book tells you everything he's seen. Don't miss it." John Casti, Santa Fe Institute, Author of "Goedel: A Life of Logic."

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Contenido: Introduction: Historical Introduction. What is LISP? Why do I like it? How to Program my Universal Turing Machine in LISP -- Program Size: A Self-Delimiting Turing Machine considered as a Set of (Program, Output) Pairs. How to Construct Self-delimiting Turing Machines: The Kraft Inequality. The Connection Between Program-Size Complexity and Algorithmic Probability. The Basic Result on Relative Complexity -- Randomness: Theoretical Interlude -- What is Randomness? My definitions. Proof that Martin-Löf Randomness is Equivalent to Martin-Löf Randomness. Proof that Solovay Randomness is Equivalent to Strong Chaitin Randomness -- Future Work: Extending AIT to the Size of Programs for Computing Infinite Sets and to Computations with Oracles.

Postscript -- Letter to a Young Reader

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