1. Record Nr. UNINA9910300154703321

Autore	Lohrey Markus
Titolo	The compressed word problem for groups / / by Markus Lohrey
Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 2014
ISBN	1-4939-0748-4
Edizione	[1st ed. 2014.]
Descrizione fisica	1 online resource (161 p.)
Collana	SpringerBriefs in Mathematics, , 2191-8198
Disciplina	512.2
Soggetti	Group theory Topological groups Lie groups Mathematical analysis Analysis (Mathematics) Group Theory and Generalizations Topological Groups, Lie Groups Analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1. Preliminaries from Theoretical Computer Science -- 2. Preliminaries from Combinatorial Group Theory -- 3. Algorithms on Compressed Words -- 4. The Compressed Word Problem -- 5. The Compressed Word Problem in Graph Products -- 6. The Compressed Word Problem in HNN-Extensions -- 7.Outlook -- References -- Index.
Sommario/riassunto	The Compressed Word Problem for Groups provides a detailed exposition of known results on the compressed word problem, emphasizing efficient algorithms for the compressed word problem in various groups. The author presents the necessary background along with the most recent results on the compressed word problem to create a cohesive self-contained book accessible to computer scientists as well as mathematicians. Readers will quickly reach the frontier of current research which makes the book especially appealing for students looking for a currently active research topic at the intersection of group theory and computer science. The word problem introduced in 1910 by Max Dehn is one of the most important decision problems in

group theory. For many groups, highly efficient algorithms for the word problem exist. In recent years, a new technique based on data compression for providing more efficient algorithms for word problems, has been developed, by representing long words over group generators in a compressed form using a straight-line program. Algorithmic techniques used for manipulating compressed words has shown that the compressed word problem can be solved in polynomial time for a large class of groups such as free groups, graph groups and nilpotent groups. These results have important implications for algorithmic questions related to automorphism groups.