Algebraic Structures and their Applications in Coding Theory and Cryptography

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ABSTRACT

This research paper explores the fundamental concepts of algebraic structures and their crucial role in the fields of coding theory and cryptography. The paper aims to provide a comprehensive overview of algebraic structures, including groups, rings, and fields, and their applications in these two domains. Additionally, it discusses various coding theory techniques, such as error-correcting codes and decoding algorithms, as well as cryptographic protocols and encryption schemes that rely on algebraic structures. The paper highlights the importance of algebraic structures in ensuring data security, confidentiality, and integrity in modern communication systems. By investigating the theoretical foundations and practical applications of algebraic structures, this research paper sheds light on the significant advancements and potential future developments in coding theory and cryptography.

Keywords: Algebraic Structures, Coding Theory, Cryptography

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