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REED-SOLOMON CODES IN EDUCATION: FROM THEORY TO PRACTICAL APPLICATIONS IN DIGITAL TECHNOLOGIES [14]

Dimitar Stoyanov, PhD Student
Department of Telecommunications
University of Ruse "Angel Kanchev"
Ruse, Bulgaria
E-mail: 7673@email.com

Assoc. Prof. Adriana Borodzhieva, PhD
Department of Telecommunications
University of Ruse "Angel Kanchev"
Ruse, Bulgaria
E-mail: aborodzhieva@uni-ruse.bg

Abstract: *This paper examines Reed-Solomon codes as a key tool for error correction in digital technologies and their place in the educational process. The basic mathematical principles of codes based on polynomials over finite fields are presented, as well as examples of their wide application – from compact discs and QR codes to space communications. Special attention is paid to the connection with education – how the study of these codes supports the understanding of algebra, computer science, and information technology, as well as what educational examples and exercises can be used in the classroom. The advantages for the educational process are emphasized – motivating students through real-world applications, building cross-curricular connections, and developing analytical thinking. The paper shows that Reed-Solomon codes are not only a mathematical achievement but also a valuable resource for modern education.*

Keywords: *Reed-Solomon codes, Error correction, Data redundancy, Polynomials, Interpolation, Digital communication, Computer science, Education, Learning process, CD, DVD, Media, QR codes, Digital video broadcasting (DVB), Information reliability, Mathematical modelling, Practical applications.*

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