



Two-Dimensional Information Theory and Coding: With Applications to Graphics Data and High-Density Storage Media

By Jørn Justesen , Søren Forchhammer

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This complete introduction to two-dimensional (2-D) information theory and coding provides the key techniques for modeling data and estimating their information content. Throughout, special emphasis is placed on applications to transmission, storage, compression, and error protection of graphic information. The book begins with a self-contained introduction to information theory, including concepts of entropy and channel capacity, which requires minimal mathematical background knowledge. It then introduces error-correcting codes, particularly Reed-Solomon codes, the basic methods for error-correction, and codes applicable to data organized in 2-D arrays. Common techniques for data compression, including compression of 2-D data based on application of the basic source coding, are also covered, together with an advanced chapter dedicated to 2-D constrained coding for storage applications. Numerous worked examples illustrate the theory, whilst end-of-chapter exercises test the reader's understanding, making this an ideal book for graduate students and also for practitioners in the telecommunications and data storage industries.

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Editorial Review

About the Author

Jørn Justesen is a Professor in the Department of Photonics Engineering at the Technical University of Denmark (DTU); a position he has held since 1976. He has previously held visiting positions at the Institute for Information Transmission Problems, Moscow, and the University of Maryland, College Park.

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