

SHU LIN / DANIEL J. COSTELLO, Jr.

Error Control Coding: Fundamentals and Applications

This new book by Shu Lin and Daniel J. Costello, Jr., shows how to achieve reliable communication over a noisy transmission channel by designing good codes and efficient decoding methods.

Error Control Coding: Fundamentals and Applications presents the essentials of this highly complex material in a way that can be understood and applied with only a minimum of mathematical background. In the 1970s the emphasis in coding research shifted from theory to practical applications and in this book there are three completely up-to-date chapters that concentrate on these applications of coding to digital transmission and storage systems. In addition, the book includes a comprehensive treatment of the error-detecting capabilities of block codes and emphasizes probabilistic decoding methods for convolutional codes.

Among its highlights, the book

- develops those concepts from modern algebra which are necessary to understand the material in later chapters;
- identifies the basic structure and properties of cyclic codes;
- details the important class of BCH codes for multiple-error-detection;
- describes majority-logic decoding and majority-logic decodable codes;
- presents various codes and coding schemes for burst error correction;
- identifies the basic structure and properties of convolutional codes;
- describes various decoding methods for convolutional codes such as Viterbi decoding, sequential decoding, and threshold decoding;
- relates a variety of applications of coding to modern day data communication and storage systems;
- includes codes actually used on many space and satellite systems and a section using convolutional codes in a hybrid ARQ system.

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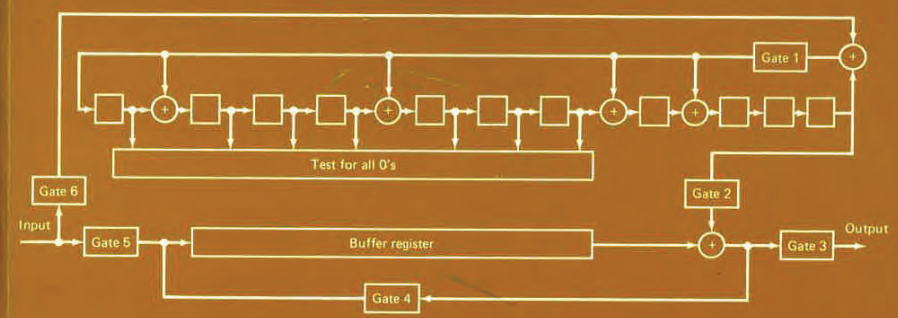
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ERROR CONTROL CODING

Fundamentals and Applications

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With Love and Affection for
Ivy,
Julian, Patrick, and Michelle Lin
and
Lucretia,
Kevin, Nick, Daniel, and Anthony Costello

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