TECHNOLOGY

Construction Method of Polar Codes

OVERVIEW

Background

Polar codes are a recently development type of linear block error correcting code that have several potential useful properties, including efficient encoding and decoding complexity, fully capacity achieving, and low error probabilities given sufficient block length. However, polar codes also have certain drawbacks, including high complexity of construction in the polar codes when using a non-binary or large alphabet. An efficient method of building polar codes would aid in the application of them to many types of information transmission and storage systems.

Innovative Technology

Researchers at the University of Maryland have developed a system for efficient polar code construction of large alphabets. Where previous non-binary polar code construction methods have exponential complexity based on the size of the alphabet, this method achieves polynomial time complexity, which allows for input alphabets of up to 16 digits to be implemented practically. The algorithm The developed algorithm also allows for uses of other polarizing transforms by combining subchannel pairs. In terms of computational complexity, the method is near the lower bound of this class of construction algorithms as described in other works.

APPLICATIONS

· Optical communications
· NAND/flash memory based storage
· RAID/ distributed storage systems

ADVANTAGES

· Works for large alphabets
· Reduces construction complexity

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EXTERNAL RESOURCES

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