

论文

## 删余低密度奇偶校验码的分析与设计

王继康, 周荷琴

中国科学技术大学自动化系 合肥 230027

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摘要

通信系统中在不同的信道条件下常采用不同的编码速率, 删余码是实现这种策略的有效方式。该文基于高斯近似思想, 分析了高斯白噪声信道上删余LDPC码的消息传递译码算法, 并在推导出消息均值迭代公式的基础上提出了一种优化删余分布的方法。仿真结果表明, 根据此优化方法设计的删余LDPC码在消息传递译码算法下, 消息均值增长较快并且消息传递译码算法具有较快的收敛速度。

关键词 [低密度奇偶校验码](#) [高斯近似](#) [删余](#)

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## Analysis and Design of Punctured LDPC

Wang Ji-kang, Zhou He-qin

Department of Automation, USTC, Hefei 230027, China

Abstract

In Communication systems, code rates are usually adapted to different channel environment, while puncturing is an effective solution to this strategy. Based on Gaussian approximation, the message-passing decoding algorithm for punctured Low-Density Parity-Check (LDPC) codes on Additive White Gaussian Noise (AWGN) channel is analyzed, as well as the recursive function for message mean is derived. According to this function, a novel design approach is proposed for optimizing the puncturing distributions. Simulation results demonstrate that not only the message mean of message-passing decoder increases more quickly for punctured LDPC optimized by the proposed approach, but also the convergence rate of message-passing decoder is faster than that by traditional approaches.

Key words [Low-Density Parity-Check \(LDPC\) code](#) [Gaussian approximation](#) [Puncturing](#)

DOI :

通讯作者

作者个人主页 [王继康; 周荷琴](#)

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