建構有較大最小周長的低密度同位檢查碼之演算法

陳怡光, 王俊鑫, 翁文彥

資訊工程學系

資訊學院

chwang@chu.edu.tw

摘要

The performance of an Low-Density Parity-Check (LDPC) code is usually determined by the position of its error floor . Studies have shown that by constructing an LDPC code with larger girth, its error-floor can also be lower. In this paper, we compared three algorithms to construct LDPC codes with maximum girth. The three algorithms are Modified Shortest Path (MSP) algorithm, random–construction with girth constraint algorithm, and Less-Greedy MSP algorithm. MSP algorithm attempts to maximize the girth of an LDPC code by choosing the longest path each time. The girth constraint algorithm sets the target girth as the threshold and avoids any cycle shorter than that threshold. We proposed a new algorithm which is a mixture of the above two algorithms. This less- greedy MSP algorithm performs a shortest path search as MSP does. However, the choice of edge is based on appropriate threshold settings instead of always choosing the longest path, thus allowing more choices during construction. Our experiment shows that MSP has slightly better performance than girth-constraint with random construction. The performance of the Less-Greedy MSP will be our future study.

關鍵字：LDPC, grith