

1023-94-1554

Lance C. Pérez, Department of Electrical Engineering, University of Nebraska, Lincoln, NE 68588-0511, and **Judy L. Walker*** (jwalker@math.unl.edu), Department of Mathematics, University of Nebraska, Lincoln, NE 68588-0130. *Towards explaining decoding errors for LDPC codes.*

The extraordinary performance of low density parity check (LDPC) codes is simultaneously remarkable and poorly understood. Theory tells us that pseudocodewords are the sole source of decoding errors when using linear programming (LP) decoding. As iterative message-passing decoding, such as sum-product decoding, can be viewed as an approximation of LP decoding, it has been suggested that pseudocodewords are a source of problems for these decoding methods as well. However, empirical results of sum-product decoding of LDPC codes reveal that not all errors can be attributed to pseudocodewords. In this talk, we will provide some empirical examples of decoding errors which are not due to pseudocodewords along with a partial explanation for this phenomenon. (Received September 26, 2006)