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Error Floor of Short-Length LDPC Codes

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Date and Time: Friday, 27 February 2009, 4:30pm – 5:30pm

Venue: Room CD634, Hong Kong Polytechnic University

Reception starts at 4:15pm

(Language: **English**)

Abstract

Low density parity check (LDPC) codes have attracted great interest among the coding community over the past decade because they can achieve performance approaching the Shannon limit. One basic requirement, however, is that the code length must be extremely long, in the order of 10^5 . But for most communication systems, only codes with much shorter lengths are feasible. On the other hand, short-length LDPC codes suffer from the error-floor issue at the high SNR region, i.e., the error probability of the code does not approach zero as quickly for medium to high SNR as it does at low SNR. In this presentation, we will dissect the LDPC codes and investigate the root of the error-floor problem. Then, we present a novel algorithm to construct LDPC codes with an aim to mitigating the error-floor problem. To find out the extremely low error rates of the codes more efficiently at the high SNR region, we will further introduce a new evaluation approach based on importance sampling and primary-trapping-set identification. Finally, some future plans will be reviewed.

About the Speaker

Xia Zheng received her BSc degree from the Department of Electronic and Information Engineering, Wuhan University, in 2003. She is now in the final stage of her PhD study, under the supervision Dr. Francis Lau. Her research focuses on short-length low density parity check codes. A total of 10 journal/conference papers have already been published/accepted and a few more are under review.