

Joint iterative channel estimation and decoding under impulsive interference condition

Patcharin Insom* **, Piyakiat Insom***, Pisit Boonsrimuang***

*Institute of Remote Sensing and Digital Earth, Chinese Academy of Science (CAS), Beijing, China, 100101

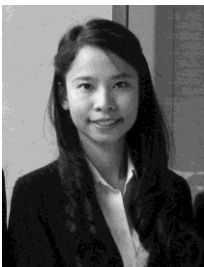
**University of Chinese Academy of Science (UCAS), Beijing, China, 100049

***Faculty of Engineering, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand, 10520

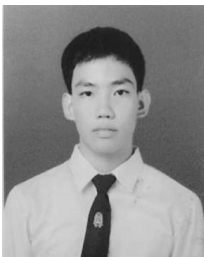
insom.patcharin@gmail.com, piyakiat_insom@hotmail.com, kbpisit@kmitl.ac.th

Abstract— Even though Low-Density-Parity-Check (LDPC) code which has the decoding performance close to the Shannon Limit and it is designed as a powerful forward-error-correction (FEC) code in the Additive White Gaussian Noise (AWGN) channel, simulation results show that the performance of LDPC decoder is degraded when exposed to the impulsive noise. According to such a impulsive noise impact, joint iterative channel estimation and decoding technique is proposed in this paper so as to decrease the effect of impulsive interference while less complicated in processing. The proposed methods decreases the complexity by implementing the simple way of channel estimation and applying joint iterative technique between channel estimation and LDPC decoding under two kind of impulsive noise; pulsed radio frequency interference(RFI) and symmetric alpha-stable (). In the optimal decoder, channel parameter estimation can be as accurate as possible. Because computed in every time of iterative decoder, channel parameters have been always optimized resulting in the enhancement of LDPC decoder performance.

Keyword— LDPC decoding, pulsed RFI, symmetric alpha-stable, Joint iterative, Channel estimation.



Patcharin Insom received the B.E. degree in Telecommunication Engineering (Second Class Honors), 2009 from King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand. In 2013, she received the M.E degree in space technology application from Beihang University, Beijing, China supported by APSCO and CSC scholarship. She currently is Ph.D candidate at the University of Chinese Academy of Sciences, Beijing, China sponsor by CAS-TWAS president fellowship. Her interested research is wireless communication and remote sensing applications.



Piyakiat Insom currently is bachelor degree student in Electronic Engineering, Faculty of Engineering, King Mongkut's Institute of Technology Ladkrabang, and Bangkok, Thailand. His interested researches are included micro-controller and wireless communication.



Pisit Boonsrimuang received the B.E. and M.E. degrees in telecommunication engineering from King Mongkuts Institute of Technology Ladkrabang (KMITL), Thailand and Dr.E. from Mie University, Japan, in 1997, 2000 and 2007 respectively. He is currently working as lecturer at King Mongkuts Institute of Technology Ladkrabang, Thailand. His research interests include transmission techniques for future multimedia wireless LAN system.