

Jammer Selection for Secure Two-way DF Relay Communications with Imperfect CSI

Jiajia Wang^{*}, Jingchao Chen[†], Hexiang Duan^{*}, Hongbo Ba^{*}, and Jianjun Wu^{*}

^{*}*Institution of Advanced Communications, EECS, Peking University, Beijing, China*

[†]*LinkedIn Corp, California, USA*

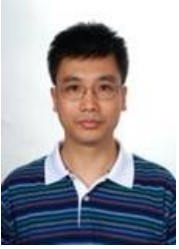
wang_jiajia@pku.edu.cn, just@pku.edu.cn

Abstract—This paper investigates jammer selection in a two-way decode-and-forward (DF) relay network with imperfect channel state information (CSI). The proposed scheme enables a selection of one conventional relay and two jamming nodes to enhance communication security against eavesdropper. The conventional relay assists two sources to exchange their data via a DF protocol. The two jamming nodes are used to create interference signals to confuse the eavesdropper. Furthermore, the asymptotic performance of proposed scheme is analyzed in detail. Under the assumption that the relay can decode received signals perfectly and when the jamming power is higher than that of source nodes, we find that the proposed scheme has a high secrecy performance which is almost independent of the position of the eavesdropper.

Keywords—Jammer selection, Physical layer security, Two-way, DF relay, Imperfect CSI.



Jiajia Wang, received his bachelor degree in communication engineering from Xi'an Communications Institute, Xi'an, P. R. China, in 2005. Since 2011, he has been a postgraduate student in Institution of Advanced Communications, Peking University, China. His research interests are in the areas of satellite mobile communications and wireless communications. Email: wang_jiajia@pku.edu.cn.



Jianjun Wu, received his B.S., M.S. and Ph.D. degree from Peking University, Beijing, P. R. China, in 1989, 1992 and 2006, respectively. Since 1992, he has joined the School of Electronics Engineering and Computer Science, Peking University, and has been appointed as an associate professor since 2002. His research interests are in the areas of satellite communications, wireless communications, and signal processing. The corresponding author. Email: just@pku.edu.cn.