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The impact of time and power allocation on the performance of the three-node decode and-forward relay channel (Conference Paper)

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Abstract

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Relying has in use for decades to tackle some of the challenges of wireless communication such as extending transmitting distance, transmitting over rough terrains. Relaying also achieve diversity which was proposed recently as an effective means to combat channel fading. In this work, effect of time and power allocation on relay performance is studied. The channel considered is the three-node channel with half-duplex constraint on the relay. The relaying technique assumed is decode-and-forward. Mutual information is used as the criteria to measure channel performance whereas noise is assumed to be the primary channel impairment. After deriving suitable formula for the mutual information as a function of time and power allocation, numerical results are obtained. Results have shown that the importance of relaying is more apparent when more resources are allocated to the relay. It was also shown that quality of the source to destination link has direct impact on the decision to relay or not to relay. Relatively good source to destination channel makes relaying less useful. The opposite is true for the other two links, namely the source to relay channel and the relay to destination channel. When these two channels are good, relaying becomes advantageous. © 2017 IEEE.

SciVal Topic Prominence

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decode-and-forward | mutual information | power allocation | relaying | Three-node channel | time allocation

Indexed keywords

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Engineering uncontrolled terms: Decode - and - forwards | Mutual informations | Power allocations | relaying | Three-node channel | Time allocation

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References (9)

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1 Marchenko, N., Andre, T., Brandner, G., Masood, W., Bettstetter, C.
An experimental study of selective cooperative relaying in industrial wireless sensor networks
(2014) *IEEE Transactions on Industrial Informatics*, 10 (3), art. no. 6825848, pp. 1806-1816. Cited 50 times.
doi: 10.1109/TII.2014.2327915
View at Publisher

2 Pandey, K.K., Jain, A.K., Mehrotra, S.
Performance analysis of cooperative communication in wireless sensor network
(2016) *2016 International Conference on Advances in Computing, Communications and Informatics, ICACCI 2016*, art. no. 7732348, pp. 2021-2026. Cited 2 times.
ISBN: 978-150902028-7
doi: 10.1109/ICACCI.2016.7732348
View at Publisher

3 (1968) *Transmission of Information in A T-terminal Discrete Memoryless Channel*. Cited 115 times.
University of California

4 Iwanow, M., Gruendinger, A., Joham, M., Utschick, W.
A study on source-relay cooperation for the outage-constrained relay channel
(2016) *WSA 2016; 20th International ITG Workshop on Smart Antennas*, pp. 1-7. Cited 2 times.