Dynamic Decode-and-Forward based Cooperative NOMA with Spatially Random Users

ABSTRACT

Non-orthogonal multiple access (NOMA) is a promising spectrally-efficient multiple access technique for the fifth generation (5G) wireless networks. In this paper, we propose a dynamic decode-and-forward (DDF) based cooperative NOMA scheme for downlink transmission with spatially random users. In DDF-based cooperative NOMA, the base station transmits the superposition of the signals intended for the paired NOMA users. Simulation results validate the analytical results and demonstrate that the proposed DDF-based cooperative NOMA scheme achieves a lower outage probability and a higher sum rate than orthogonal multiple access (OMA), conventional NOMA, and cooperative NOMA.

EXISTING SYSTEM

- In existing system, Signal alignment is utilized to mitigate the co-channel interference between different NOMA user pairs
- Random beamforming is employed to reduce the channel estimation overhead in millimeterwave NOMA systems and tools from stochastic geometry are utilized to analyze the sum rate of the paired users.
- However, by sharing the frequency channel and the transmit power with the near user.

PROPOSED SYSTEM

- We develop a tractable performance analysis framework for the proposed DDF-based cooperative NOMA scheme for downlink transmission with spatially random users.
- It consider two user pairing strategies, which entail different CSI requirements and offer different tradeoffs between network performance and implementation complexity.

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS

- Processor - Intel core i3
- RAM - 2B
- Hard Disk - 20 GB

SOFTWARE REQUIREMENTS

- Operating System : LINUX
- Tool : Network Simulator-2
- Front End : OTCL (Object Oriented Tool Command Language)

REFERENCE

[1] Y. Zhou, V. W.S. Wong, and R. Schober, "Performance analysis of cooperative NOMA with dynamic decode-and-forward relaying," in Proc. of IEEE Globecom, Singapore, Dec. 2017.

[2] L. Dai, B. Wang, Y. Yuan, S. Han, C.-L. I, and Z. Wang, "Nonorthogonal multiple access for 5G: Solutions, challenges, opportunities, and future research trends," IEEE Commun. Mag., vol. 53, no. 9, pp. 74–81, Sept. 2015.

[3] M. Shirvanimoghaddam, M. Dohler, and S. Johnson, "Massive nonorthogonal multiple access for cellular IoT: Potentials and limitations," IEEE Commun. Mag., vol. 55, no. 9, pp. 55–61, Sept. 2017.

[4] V. W.S. Wong, R. Schober, D.W.K. Ng, and L. C. Wang, Key Technologies for 5G Wireless Systems. Cambridge University Press, 2017.

[5] Y. Saito, A. Benjebbour, Y. Kishiyama, and T. Nakamura, "System-level performance evaluation of downlink non-orthogonal multiple access (NOMA)," in Proc. of IEEE PIMRC, London, UK, Sept. 2013.