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School of Electrical
Engineering

Dissertation press release   **03.06.2020**

More throughput with interference cancelation in 5G

Title of the dissertation	Network Interference Cancelation for 5G
Contents of the dissertation	5G wireless communication is based on cellular networks with aggressive reuse of radio resources. Radio transmissions on the same frequency resources may interfere with each other, which limits the spectral efficiency of communication networks. This dissertation has developed Radio Resource Management (RRM) algorithms that can improve the spectral efficiency by applying specific Interference Cancelation (IC) in 5G networks. The dissertation shows that the spectral efficiency of 5G network can be considerably improved in different scenarios.
	In the scenario where Device-to-Device (D2D) communications are involved, a centralized optimization algorithm and distributed algorithms based on strategic games are developed and compared. The simulation results show that spectral efficiency can be considerably improved by adjusting users' transmission power, coding rate and IC configurations. In addition, a radio resource optimization method is proposed for the scenario where interference cancelation is applied in cellular downlink transmissions. The utility of the whole network is maximized by a radio resource optimization method that is distributed among the cells. The simulation results show significant improvements of the rate of cell-edge users.
Field of the dissertation	Communication engineering
Doctoral candidate	Liang Zhou, M.Sc. Born in China, 1984"
Time of the defence	16.06.2020 Time 12:00 at noon
Place of the defence	Aalto University, School of Electrical Engineering, remote link
Opponent	Professor Di Yuan, Uppsala University, Sweden
Custos	Professor Olav Tirkkonen, Aalto University School of Electrical Engineering, Department of Communications and Networking
Electronic dissertation	http://urn.fi/URN:ISBN:978-952-60-3920-6
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A doctoral dissertation is a public document and shall be available at Aalto University, School of Electrical Engineering, Maarintie 8, main hall at the latest 10 days prior to public defence.