

**Call for application for research scholarships
for post-graduate international candidates**

RESEARCH PROJECT N. 60

Title
Optimal Resource Allocation in 5G Full-duplex Networks
Scientific responsible (name, surname, role)
Carla Fabiana Chiasserini, Associate Professor (carla.chiasserini@polito.it)
Short description of the research activity (max 250 words)
The research activity focuses on 5G full-duplex networks where nodes can transmit and receive simultaneously, using the same radio resources. This new paradigm has been recently introduced to increase the network efficiency and allow a better usage of the available radio resources. However, full-duplex nodes are affected by self-interference, which may significantly degrade their performance. It is therefore of paramount importance to design and implement new solutions that yield very high communication rates while limiting power consumption. In this context, the research activity will focus on the development models for the 5G data sources (e.g., cellular macrocells) as well as of picocells that can relay data toward farther away users. Through such models and considering different wireless channel statistics, we can study the performance of the system in terms of data rate, reliability and power consumption. Indeed, the data sources and relay will have to use different power levels in transmission depending on the network conditions and the transmission technique that is envisioned. Then the research activity will aim at defining innovative strategies at the source and relay, which optimize the utilization of radio resources as well as of the antennas at the communication nodes. Analytical results will be validated through numerical results and, whenever possible, through experiments. The research activity will be carried out in collaboration with Professor Emanuele Viterbo, Monash University, Australia.
Specific requirements (experiences, skills)
Good mathematical background Good knowledge of wireless communication channels Programming using Matlab
Website of the research group (if any)
https://www.telematica.polito.it/public/faculty/carla-fabiana-chiasserini
Keywords (min 3, max 6)
Full-duplex communication systems, 5G radio, wireless networks
Research Area (max 1)

Electronics, Control and Telecommunication Engineering