

LINK DESIGN AND RESOURCE OPTIMIZATION FOR 5G WIRELESS SYSTEMS

ABSTRACT ENGLISH

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The development of 5G wireless communications systems imposes more demanding challenges in the research field to guarantee better proposals to the scientific community. The integration of many technologies is of great importance to provide a service with massive connectivity, large bandwidth, high spectral efficiency, and low latency to users, that today are not only Cellular Users.

In this context, we have developed different simulation scenarios at both the Physical Layer level and Network Access Layer level, in the framework of the wireless networks for 5G communications. We have evaluated a new proposal for the multi access scheme called Generalized Frequency Division Multiplexing (GFMD), in order to reduce the large PAPR and signal distortion in the system.

In addition, an experimental scheme is developed over SDR systems, where various processing techniques are combined over MIMO channel in order to improve the BER performance and Capacity.

However, a two-tier Heterogeneous network with Macro&Femto Cells is investigated, considering pilots-aided channel estimation. An Admission Control Algorithm at the BS manage the number of users to be served based on their rate requirements in this way the QoS constraint.

Finally, network planning is investigated for a hybrid communications infrastructure Fiber&Wireless (FiWi) in order to allocate the disaggregation point splitters-BS to optimize coverage overall users. An optimal heuristic algorithm is proposed for the allocation over a georeferenced plane which considers the constraints of an urban infrastructure.