Distributed Power Allocation for Multi-Flow Carrier Aggregation in Heterogeneous Cognitive Cellular Networks

ABSTRACT

In this paper, we study distributed power allocation for multi-flow carrier aggregation (MFCA) in cognitive cellular networks. Our approach differs from the conventional water filling (WF) algorithm since we deal with the heterogeneous fading channels, wherein all of the Lagrange multipliers are not handled equally over the heterogeneous cells. We first formulate the optimization problem and we next solve it using the alternating direction method of multipliers (ADMM), which allows the required decomposition for each channel and required statistical learning among the different sub-problem solutions.We also provide comparison with dual decomposition method (DDM) and WF solutions considered as solutions without cognition. Simulation results highlight the performance gain of ADMM in terms of number of iterations. Further, we provide a multiuser application scenario, where the analysis on the new fading channel model for Nakagami-m channels is carried out.

EXISTING SYSTEM

- In existing system, the conventional water-filling (WF) algorithm is not practical any more.
- Instead of having an independent (from the other links) optimal power allocation, we need to devise new solutions to manipulate more than one Lagrange multipliers in parallel and simultaneously due to the heterogeneity of the channel gains.
- In such a multi-user application scenario, the solution is also more demanding and this is an additional feature required to make the power allocation more agnostic and intelligent through cognition (i.e. statistical learning) towards the 5G networks

PROPOSED SYSTEM

- In proposed system, the distributed power control problem when carrier aggregation in heterogeneous cognitive cellular networks is deployed. .
- The proposed optimization problem using DDM in order to establish a benchmark to the ADMM-based algorithm .
- The ADMM combines the principles of the dual decomposition using also the augmented Lagrangian tool for gradual Learning.

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)

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