

Frequency Allocation and Load Balancing

M.Sc. Thesis

Background

As the number of users and traffic demand in the wireless networks is increasing, there is a strong need to provide efficient load balancing and resource allocation methods. One very challenging issue is how to do such resource allocation within loosely coordinating systems, such as Wi-Fi networks. While there has been a lot of work done in this domain, even more research is required to gauge practically deployable algorithms for load balancing purposes.

Tasks

In this work you study distributed mechanisms to achieve load balancing and frequency distribution between (loosely coordinating) distributed access points. The work will start with the critical analysis of some of the key techniques and algorithms such as online graph colouring, interference graphs, and load balancing methods. Depending on the interest of the student, we then proceed either to emphasis theoretical development of novel algorithmic framework and simulation based verification, or alternatively emphasise the practical algorithm implementation (using most likely C/C++ and Python) and build a small scale real hardware testbed to measure the efficiency of the developed concept.

Other Information

The actual goals and work of the thesis will be tailored with the student interests. In general, the work is done in the context of distributed and not highly coordinated networks. Interest on Wi-Fi networks, local area networking, and capability to understand different algorithms (and their mathematical descriptions) is a strong plus. Basic programming skills will be helpful, but one does not need to be Linux Kernel guru for this thesis work.



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