Master Thesis – Coverage Based Carrier Aggregation

Background
To increase the data-rate in NR (New Radio – 5th generation of mobile networks) a mobile phone can aggregate data from multiple carriers (for example different frequencies). This is called carrier aggregation.

It is straightforward to calculate the total bandwidth achieved with different carrier aggregation combinations, however it is difficult to understand what the resulting throughput will be. For example, the user may be moving, and completely lose coverage of some of the carriers so that a different combination would be a better choice, or the signal strength could be very poor, yielding a low bit-rate even if the available bandwidth is large.

In order to evaluate different schemes for selecting the carriers for carrier aggregation, signal strength, and mobility of the users need to be taken into account.

Thesis Description
The goal of this thesis is to enhance a radio signal strength emulator with carrier aggregation selection, and to evaluate algorithms for carrier aggregation selection in this emulator.

The following steps are envisioned as part of the thesis work:

- Investigate and compare current research covering different carrier selection methods.
- Implement at least one carrier selection method and test using simulation.
- Analyze results of the tests and evaluate resulting throughput achieved.

Qualifications
This project aims at students in electrical engineering, computer science, computer engineering or similar. Background in wireless communication is preferred.

Extent
1 student, 30hp

Location
Ericsson AB Mjärdevi, Linköping

Preferred Starting Date
Spring 2020

Keywords
Java, Mobile Telecommunication, Optimization

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