

Master Project

Performance evaluation of scheduling schemes for UMTS Enhanced Uplink

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Enhanced Uplink (EUL) is a new technology currently in vigorous research that will support even higher data rates on the uplink than UMTS R'99 can support. In order to achieve such higher data rates there are three major changes made in EUL compared to UMTS one of them being the used scheduling scheme. The scheduling scheme determines the order in which users are served (can transmit their data) and can be very diverse. Such variety opens many possibilities for research. Examining possible scheduling schemes allows a good choice to be made for practical application. Therefore it is of great importance that both the schemes and the environment in which they operate are correctly analyzed and modeled. The environment itself can be represented at different level of details and by several influencing factors such as interference. The current research on EUL consists of mathematical descriptions of the schedulers extended by Markov models to reflect the flow level dynamics. The steady state distribution, found either from closed form equations or simulation in Matlab, provides with means to evaluate the performance.

The goal of the assignment is to examine three scheduling schemes for EUL, more specifically one-by-one, partial parallel and full parallel.

The steps included in this research are:

- Get familiar with EUL/UMTS and the scheduling schemes and the environment in which the schemes operate.
- Get familiar with current modeling of UMTS uplink scheduling.
- **Focus:** Introduce user mobility in the analysis and modeling of the schemes. At the modeling step use mathematical models and Markov chains.
- Modify (or redefine) the schemes to operate as channel aware schedulers.
- Define evaluation scenarios to compare and evaluate the schemes.

It is possible that in the research process other directions become more interesting than the originally stated. In that case deviation of the original target is possible. However evaluation of user mobility is a necessary part for the successful completion of the project. Upon successful completion the student will present a written report and give a final presentation. If appropriate a mid-term presentation can be also planned.

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