

Masterthesis

Localization of mobile users based on time-of-arrival and direction-of-arrival estimation algorithms in non line-of-sight environments

Having the knowledge of the location of a mobile user in a mobile radio scenario is necessary to offer location-based services. One of the most popular localization technique is the global positioning system (GPS), which is based on several satellites. Unfortunately, additional hardware in terms of a GPS receiver is necessary to estimate the own position. To overcome this drawback different localization techniques were already investigated and are still in development. Many techniques are based on the estimated channel transfer functions (CTFs). In order to estimate the CTFs no additional hardware is required. Based on the estimated CTFs it is possible to estimate the time-of-arrival (TOA), the direction-of-arrival (DOA) and direction-of-departure (DOD). With the estimated TOAs, DOAs, and DODs of the electromagnetic waves a localization is feasible.

In this work, the following tasks are expected to be completed.

- Inspection of state of the art techniques to locate the position of a mobile user in a mobile radio system.
- Investigation of techniques to estimate the TOAs, DOAs, and DODs based on the estimated CTFs.
- Implementation of a localization algorithm in Matlab.
- Performance evaluation of the implemented algorithm.

Literature

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