



TIME DELAY-BASED RADIO LOCALIZATION IN MOBILE OUTDOOR SCENARIOS

MSc/BSc projects

CONTACT INFO

PERSON:
Dr. Anastasia Lavrenko

OFFICE:
C3623

EMAIL:
a.lavrenko@utwente.nl

Time delay-based distributed radio localization in mobile outdoor scenarios

Keywords: radiolocation, multilateration, time-of-flight estimation, time-of-arrival estimation.

Introduction: Radiolocation methods are used in a wide range of applications, from radar systems to cellular communications and navigation. Accurate localization capabilities become even more important in light of the widespread deployment of unmanned aerial vehicles (UAVs) and recent advances towards autonomous driving.

While ubiquitous node mobility provides new opportunities for target localization and tracking, it also introduces additional challenges to location estimation, as not only the target but also the anchor (sensing) nodes can now be mobile. The aim of this project is to 1) understand how the node mobility affects location estimation performance in time-delay based localization and 2) investigate potential ways to counter-measure its negative effect.

Project description: The main goal of this project is to evaluate, analytically and in simulations, influence of

- the system geometry (position of anchor nodes wrt target),
- the system ambiguities (anchor self-positioning, range estimation, target altitude),
- the localization mode (time-of-flight, time-of-arrival, time-difference-of-arrival estimation),

on the localization accuracy, and investigate methods to improve estimation accuracy under varying operational conditions.

Results of this work will be potentially considered for conference and/or journal publication.

Requirements: You are a motivated student looking for a Bachelor or Master thesis topic in the field of radio systems. You have strong Matlab programming skills, enjoy analytical/algorithmic studies and have knowledge of signal theory and signal processing basics, e.g., terms such as correlation function, Fourier transform and probability density function are familiar to you.

Either a Master or a Bachelor project is possible on this topic.

If you are interested, please contact **Dr. A. Lavrenko** at a.lavrenko@utwente.nl.