

Distributed Target Localization in Wireless Sensor Networks

Bachelor / Master thesis

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Description:

Over the last few years, there has been a rising interest for tracking moving targets (e.g., mobile robots, quadrotors) in different industrial facilities through wireless sensor networks. In such networks, wireless sensors are used to measure and estimate in a distributed way (through information exchange, distributed data fusion and filtering algorithms) the position of a moving target. In this project, the student will revise the current state-of-the-art approaches, identify their limitations due to communication impediments, and develop distributed target localization algorithms in real wireless sensor networks.



Keywords: wireless sensor networks, distributed localization, Kalman-Consensus filters.

Deliverables:

- A demonstration of a working example
- A thesis in which the current state-of-the-art is described, the design of the working example is thoroughly explained for the hardware, the software and the theory supporting it.

Work type: 30% literature review, 50% simulations, 20% theoretical analysis

Tools: Python, MATLAB

References:

- [1] "Distributed Tracking in Sensor Networks with Limited Sensing Range", Reza Olfati-Saber and Nils F. Sandell. In American Control Conference, 2008.
- [2] "On Kalman-Consensus Filtering with Random Link Failures over Sensor Networks", Qinyuan Liu, Zidong Wang, Xiao He, and D.H. Zhou. In IEEE Transactions on Automatic Control, 2018.