



Título: Bayesian Multilateration

Data: 21/12/2022

Horário: 14h00

Local: Sala de Seminários - Bloco 952

Resumo:

Abstract—Multilateration (MLAT) is the de facto technique to localize points of interest (POIs) in navigation and surveillance systems. Despite sensors being

inherently noisy, most existing techniques i) are oblivious to noise patterns in sensor measurements; and ii) only provide point estimates of the POI. This often results in unreliable estimates with high variance, i.e., that are highly sensitive to measurement noise. To overcome this caveat, we advocate the use of Bayesian modeling. Using Bayesian statistics, we provide a comprehensive guide to handle uncertainties in MLAT, including principled choices for the likelihood function and the prior distributions. Notably, the resulting model is easy to implement and can leverage off-the-shelf Markov Chain Monte Carlo (MCMC) software for inference. Besides coping with unreliable measurements, our framework can also deal with sensors whose location is not completely known, which is an asset in mobile systems. Our solution also naturally incorporates multiple measurements per reference point, a common practical situation that is usually not handled directly by other approaches. Comprehensive experiments with both synthetic and real-world data indicate that our Bayesian approach to the MLAT task provides better position estimation and uncertainty quantification when compared to the available alternatives.

Banca examinadora:

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