Graph-Based Cooperative Localization Using Symmetric Measurement Equations

Abstract:
Precise localization is a key requirement for the success of highly assisted or autonomous vehicles. The diminishing cost of hardware has resulted in a proliferation of the number of sensors in the environment. Cooperative localization (CL) presents itself as a feasible and effective solution for localizing the ego-vehicle and its neighboring vehicles. However, one of the major challenges to fully realize the effective use of infrastructure sensors for jointly estimating the state of a vehicle in cooperative vehicle-infrastructure localization is an effective data association. In this paper, we propose a method which implements symmetric measurement equations within factor graphs in order to overcome the data association challenge with a reduced bandwidth overhead. Simulated results demonstrate the benefits of the proposed approach in comparison with our previously proposed approach of topology factors.