Design of Cooperative Positioning Protocol for Positioning Error Mitigation

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**ABSTRACT**

Collaborate robot is studied for solve the task which is more efficiently performed compared to standalone robot. For this purpose, localization of robots is important. Cooperative positioning (CP) is the system that mobile robot localizes from other robots and back and forth. Since this process cumulates the positioning error of the robot, Angle-of-Arrival (AOA) based CP is studied in order to expand the workspace of robots with comparatively small increase of error. On the other hands, Time-of-Arrival (TOA) based CP is possible when mobile anchor is used. Mobile anchor is a node which can act as anchor or tag.

This paper introduces the cooperative positioning protocol for TOA based CP and the error propagation of the error for each scenario is analyzed. The performance of TOA base CP with formation protocol is evaluated. In conclusion, TOA based CP is expected to be performed with reasonable increase of error with predefined localization protocol.

Keywords: cooperative positioning, mobile anchor, formation protocol