

Rattikar Punviset 2012: A Localization Algorithm Based on Markov Random Field Model for a Stationary Wireless Sensor Network. Master of Engineering (Information and Communication Technology for Embedded Systems), Major Field: Information and Communication Technology for Embedded Systems, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Teerasit Kasetkasem, Ph.D. 89 pages.

The localization is one of the most important problems for the deployment of wireless sensor networks, especially when the number of sensor nodes is large. The received signal strength (RSS) based localization algorithm is proposed in this work. Here, the RSSs from neighboring sensors are assumed to be statistically dependent. We propose the use of Markov random field to model the correlation of received signal strength of neighboring nodes and to explain this dependency. The maximum likelihood estimate based on this model has been also developed. With this model, our experiment has shown that our proposed algorithm can improve the localization accuracy the localization error can be improved over the traditional localization algorithm without neighboring nodes' information.

---

Student's signature

---

Thesis Advisor's signature

— / — / —