Environment Recognition using Wireless Personal Area Networks

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Research Topics

- Interference reduction in a many IEEE802.15.4 terminal environment
- Communication quality assurance among standards of wireless communication
- Localization and estimation of traffic congestion using wireless personal area networks

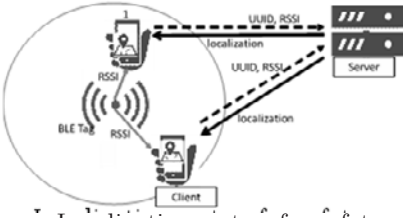
Research Seeds

Environment recognition using Wireless Personal Area Network

The ubiquitous age has arrived. Low battery sensor devices have become important. The IEEE802.15.4 standard, which is made for sensor networks, allows numerous terminals to be connected on a single network. However, interference from many terminals has increased. We propose a method of interference reduction for IEEE802.15.4. Our proposed method uses grouping and waiting. The experiment was conducted in an actual environment using 8 and 16 terminals. Figure 1 presents our experiment results: our method is faster than the current one.

Experiment for interference

Moreover, we apply this method to estimation of traffic congestion. Constructing a server-less network is a unique characteristic among systems. Figure 2 presents our proposed model. We propose a system to estimate the traffic congestion distance using IEEE 802.15.4, which is extended by multi-communication frequency division multiplexing. Our proposed system is developed at a 20% equipped rate, in which five lanes are considered. Furthermore, for our proposed system, it is assumed that the equipped rate in all lanes increases. Our proposed method can estimate an error rate of lower than approximately 10% at an equipped rate of greater than 50%. Additionally, we use 16 terminals in the actual environment.



Localization system for safety

Related Technology

- Technology of interference reduction for IEEE802.15.4
- System development with wireless personal area networks
- Estimation of traffic congestion using wireless personal area networks