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Report

SnapLoc: An Ultra-Fast UWB-Based Indoor Localization System for an Unlimited Number of Tags

The paper presents SnapLoc, a UWB-based indoor localization system that attempts to improve over the prevailing UWB based localization systems by allowing for faster position updates and greater density of tags, while still providing similar accuracy. The system consists of anchors and tags. Anchors are radios that are placed at fixed points within a room. Their job is to aid in finding the position of a tag within a room. A tag is another radio that could be part of a phone or could be placed onto an object that is being tracked. The purpose of the system is determine the location of the tag within the room as the tag moves around. The system is able to achieve decimeter-level localization accuracy while achieving a high update rate of up to 2.3 KHz.

The novelty of this research comes from the proposed localization algorithm that has anchors sending out signals to tags instead of the other way around. This allows the system to scale up to an unlimited number of tags as the job of computing positions is pushed to the tag rather than anchors. With the anchor based approach, the number of tags that can be tracked in the room(with reasonable performance) would be bottlenecked by anchors. Another contribution is a scheme for correcting timestamps for signals that are sent out by anchors. This removes the need for tight time synchronization between all anchors in the system.