

Localization of multiple persons using UWB in indoor scenarios

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Abstract:

Indoor localization and tracking of people in limited or obstructed visibility is important in many surveillance applications. It is especially important in security applications, when a room should be inspected for expected or unexpected persons before entering. Using a network of ultra-wideband-(UWB) sensors allows for through-wall detection and tracking of people using only the reflections of the moving persons. Here we describe an approach that uses a network of multiple UWB sensors to detect, localize and track multiple moving persons within a room of interest. Each UWB sensor can work autonomously to localize people. The information regarding each detected person by each sensor is then fused at a central fusion node to define the locations of the detected persons in the room. This article describes the design of the distributed UWB sensor network as well as the methods used for near real-time detection, localization and tracking of multiple people. The approach presented is verified using simulations and experimental data gathered using a network of three UWB sensors placed behind the walls of a room.