Passive indoor tracking with (ultra) wideband systems

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Abstract:

In this document, wireless localization and tracking of multiple objects (intruders) in indoor environments is considered. We show that passive techniques, which do not require that intruders wear radio transceivers, may provide a very good accuracy. We analyse a tracking system consisting of a transmitter and few wideband or ultra wideband receivers deployed in a single room. We assume that two intruders enter and pass through the room and their movement should be tracked. We do not presume perfect receivers being able to measure the exact channel impulse response. Instead, we assume the system receivers are able to approximately measure the energy of certain parts of their channel impulse responses.
The results of simulations prove that the system can track two intruders simultaneously with good accuracy, if only the number of system receivers is sufficiently high.