

RESEARCH PAPER

Indoor target localization using single marginal antenna with virtual radars support

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In urban target localization, the presence of walls creates virtual radars (VRs), which can be exploited to aid in localization process. The fact that multipath changes with the radar locations, which are referred to as aspect dependence property, enable us to find a radar location, which reduces wall uncertainties. This paper proposes single-antenna target localization in an enclosed structure taking advantage of VRs. Using ultra-wideband signals, we can resolve the target returns and estimate the correct location by solving monostatic loci at real and VR locations. Simulation results show that the method can precisely and accurately localize the target for a wide range of timing errors.

Keywords: Aspect dependence, Marginal-antenna, Multipath exploitation, Target localization, Virtual radar

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