

Localization of Near Field Radio Controlled Unintended Emitting Sources

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Abstract : Locating radio controlled (RC) devices using their unintended emissions has a great interest considering security concerns. Weak nature of these emissions requires near field localization approach since it is hard to detect these signals in far field region of array. Instead of only angle estimation, near field localization also requires range estimation of the source which makes this method more complicated than far field models. Challenges of locating such devices in a near field region and real time environment are analyzed in this paper. An ESPRIT like near field localization scheme is utilized for both angle and range estimation. 1-D search with symmetric subarrays is provided. Two 7 element uniform linear antenna arrays (ULA) are employed for locating RC source. Experiment results of location estimation for one unintended emitting walkie-talkie for different positions are given.

Keywords : localization, angle of arrival (AoA), range estimation, array signal processing, ESPRIT, Uniform Linear Array (ULA)

Conference Title : ICCSSE 2015 : International Conference on Control Science and Systems Engineering

Conference Location : Istanbul, Türkiye

Conference Dates : February 16-17, 2015