



DISTRIBUTED TARGET LOCALIZATION AND TRACKING WITH WIRELESS PYROELECTRIC SENSOR NETWORKS

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Abstract- Due to the disadvantages of traditional localization & tracking at those aspects of users' privacy protection, system configuration and maintenance, this paper proposes a new approach for infrared object localization and tracking with distributed wireless pyroelectric infrared sensors. A hierarchical architecture of visibility of Fresnel lens array is presented with spatial-modulated field of view (FOV). Firstly, the FOVs of Fresnel lens array in a sensor node are modulated to achieve a single degree of freedom (DOF) spatial partition; then the localization algorithm is proposed to coordinate multiple sensors nodes to achieve two DOF spatial partitions. To effectively solve the problem of WSN energy imbalance, a strategy of neighbor table multicast and an electoral method of the dynamic cluster head based on the biggest energy are presented in the distributed wireless sensor networks. The experiments show that the method proposed here has the advantages in high accuracy and strong anti-interference capability.

Index terms: wireless sensor networks, motion detecting, target localization, target tracking, pyroelectric infrared.