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Hybrid RSS-SOM Localization Scheme for Wireless Ad Hoc and Sensor Networks

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Abstract-Localization of wireless ad hoc and sensor networks has gained much research attention for several years. This paper proposes a hybrid localization scheme which exploits Received Signal Strength (RSS)-based ranging and Self Organizing Maps (SOM)-based range free localization methods to obtain the tradeoff between cost, power and location accuracy. Distance information from RSS measurement has been utilized in the learning steps of SOM-based localization algorithm to get more accurate location estimates while reducing the number of learning steps. Methods on RSS uncertainty reduction and obstacle filtering are also incorporated in the proposed RSS-SOM scheme. Results from extensive simulations prove that our proposed hybrid solution outperforms several existing localization algorithms in both isotropic and anisotropic network environments with lower anchor utilization.
Keywords-component; RSS; SOM,' Localization;