SPACE PARTITIONING STRATEGIES FOR INDOOR WLAN POSITIONING WITH CASCADE-CONNECTED ANN STRUCTURES

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References:

Abstract:
Position information in indoor environments can be procured using diverse approaches. Due to the ubiquitous presence of WLAN networks, positioning techniques in these environments are the scope of intense research. This paper explores two strategies for space partitioning when utilizing cascade-connected Artificial Neural Networks (ANNs) structures for indoor WLAN positioning. A set of cascade-connected ANN structures with different space partitioning strategies are compared mutually and to the single ANN structure. The benefits of using cascade-connected ANNs structures are shown and discussed in terms of the size of the environment, number of subspaces and partitioning strategy. The optimal cascade-connected ANN structures with space partitioning show up to 50% decrease in median error and up to 12% decrease in the average error with respect to the single ANN model. Finally, the single ANN and the optimal cascade-connected ANN model are compared against other well-known positioning techniques.

Keywords:
location, positioning, cascade-connected, space partitioning, radio, Artificial neural network, WLAN.