Review report

Summary:

The paper proposes a novel range-free localization algorithm for wireless sensor networks. The authors attempt to address the problem of the requirement of large training data sets by Deep Neural Networks in the absence of such. They employ an efficient data augmentation strategy by creating multiple virtual anchors besides the actual anchors.

They claim the proposed approach has effectively expanded the data sets available for training and they have achieved improved location accuracy and reduced errors as well as cost effectiveness.

The claimed contribution of this paper is increasing the amount of training datasets by creating a multi-virtual anchor around the actual anchors.

Methodology, used to create virtual anchors coordinates is basically regressing the coordinate of a real anchor and doesn't really create another reference point for localization purposes rather than random probability given by Gaussian variations.

General concept comments

The main weakness of the article is the proposed methodology is flawed. The applicability of data augmentation technique proposed for the WSN localization is weak (questionable).

Other weaknesses of the paper include insufficient references to establish the theory of virtual anchors.

The proposed virtual anchor algorithm is not sufficient to justify improved location accuracy.

Review:

The introduction and the related work sections should cover relevant and comprehensive references to justify the proposed work. There are a number of basic introductions of basic concepts e.g. intro to ANN.

The presentation of data augmentation section is very specific examples and are not general. The equation (equation. 9) describing the training data size (D_t) is not described as to how the relations between the variables are stablished.