Classification Prediction for Indoor Localization with Bluetooth iBeacons

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The Dataset

- Collected by an individual walking around with an iPhone 6S
- 1420 rows with signal readings for each beacon from -55 to -200
- Each row has the corresponding location of the individual on a grid

Data Preparation

01
Beacon readings normalized

02
Location column values validated

03
Location column split into two

Research Goal

Classifying the location of an individual based on the readings from all 13 iBeacons

Models Used

K-Nearest Neighbor

Decision Tree

Modelling steps

Step 1

Run the classifier with the default parameters

Step 2

Optimize the parameters by using nested loops to have all possible combinations, and obtain the best result

Step 3

Run K-Folds cross validation to get the best train/test data

Step 4

Apply this train/test fold to the tuned model

Results → K-Nearest Neighbour

	PRECISION	RECALL	F1-SCORE
ACCURACY			0.75
MACRO AVG	0.56	0.51	0.51
WEIGHTED AVG	0.84	0.75	0.75

Results → Decision Tree

	PRECISION	RECALL	F1-SCORE
ACCURACY			0.62
MACRO AVG	0.48	0.40	0.41
WEIGHTED AVG	0.77	0.62	0.64

conclusion and recommendation

KNN!