THINKFUL

Indoor WiFi Locator

Overview and problem statement

- Indoor location of a person in a complex would be useful for rescue, marketing, navigation, etc.
- Wireless Access Points (WAPs) have become ubiquitous
- Can reading the WiFi signal strength of multiple WAPs narrow down a person’s location?

Data analyzed

- Approximately 20k records with 529 attributes
- Link to UCI dataset
-
- Each WiFi fingerprint can be characterized by the detected Wireless Access Points (WAPs) and the corresponding Received Signal Strength Intensity (RSSI). There are 520 WAPs.

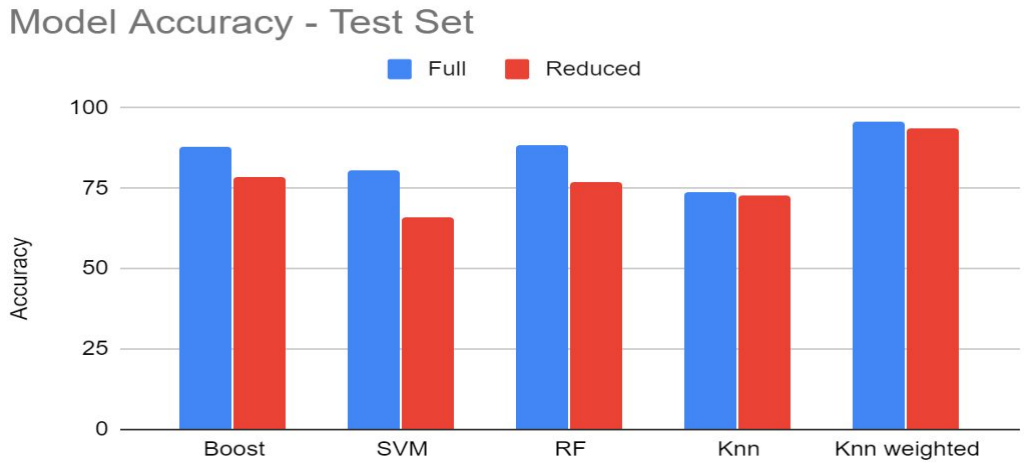
Focus: use classification to determine building/floor location (created feature) just by RSSI

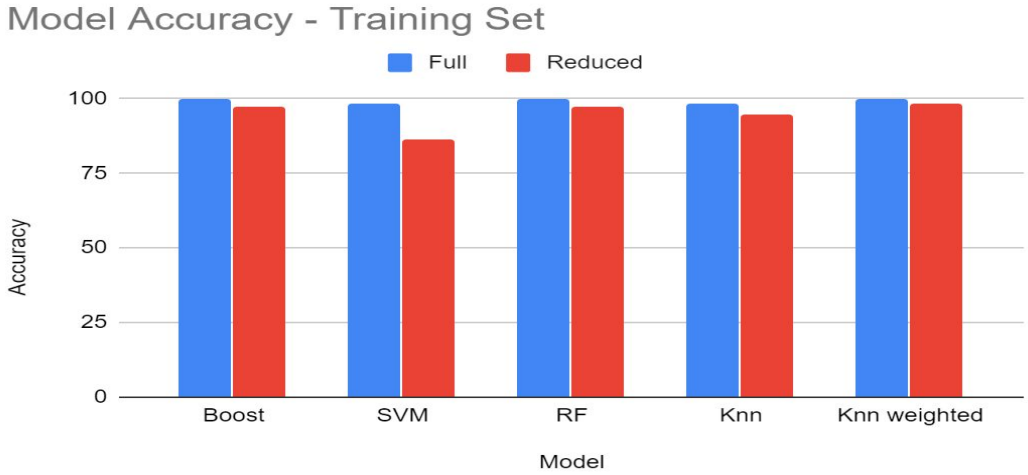
3 buildings with 3-4 floors per building

Also try models with reduced features

Results

Weighted KNN performs best





Model parameters

- Boost
  - max_depth
  - number of estimators
  - learning_rate
  - sub_sampling
- KNN (non-normalized data)
  - nearest neighbors
  - weighting

Next Steps

- For KNN, try normalizing data to improve the score even more
- For boost cross val score varies, indicating overfitting/model needs improvements
- Need to try more aggressive regularization techniques for most models
- There were 9 other features dropped from the initial model, try adding those back in
- Is test set different from training set?

Questions?

Thank You