

# Streamlit output pdf

Sunday, February 2, 2025 4:52 PM

Git hub link:

[https://github.com/atiagull/indoor localization using wifi](https://github.com/atiagull/indoor_localization_using_wifi)

Roll No. : MSDSF24M001

Do these installations:

Pip install joblib

Pip install xgboost

Following is the output after running streamlit\_code.py file

Shape (23,000, 177)

## Data Table ⇄

	Cid	AP001	AP002	AP003	AP004	AP005	AP006	AP007	AP008	AP009	AP010	AP011
0	L4-40-1	-84	-80	-71	-58	-110	-72	-71	-110	-110	-110	-110
1	L4-40-1	-84	-79	-71	-58	-110	-72	-71	-110	-110	-110	-110
2	L4-40-1	-110	-110	-70	-56	-110	-69	-68	-110	-110	-110	-110
3	L4-40-1	-110	-110	-70	-53	-110	-69	-68	-110	-110	-110	-110
4	L4-37-2	-84	-82	-75	-65	-110	-73	-75	-110	-110	-110	-110

# Introduction

Aim of this project is to identify the location of person/device inside the building based on various wifi access points (APs) signals strength as well as environment variable such as open/closed room and human presence or absence. data is collected using 4 devices.

Unique identifier for the indoor region

AP001-AP172: RSS values from 172 AP

Rs: Room status indicator; 1 for open, 0 for closed rooms

Hpr: Human presence indicator; 1 for presence, 0 for absence.

Ts: Timestamp

Did: Device identifier for data collection, representing:

- D1: Samsung Galaxy Tab 2, Android 4.1.1
- D2: Samsung Galaxy Tab E, Android 5.0
- D3: Samsung Galaxy Tab 10, Android 4.0
- D4: Motorola Moto E (2nd Gen), Android 5.1

## DATA VISUALIZATION

Select APs for the heatmap

AP001 x

AP002 x

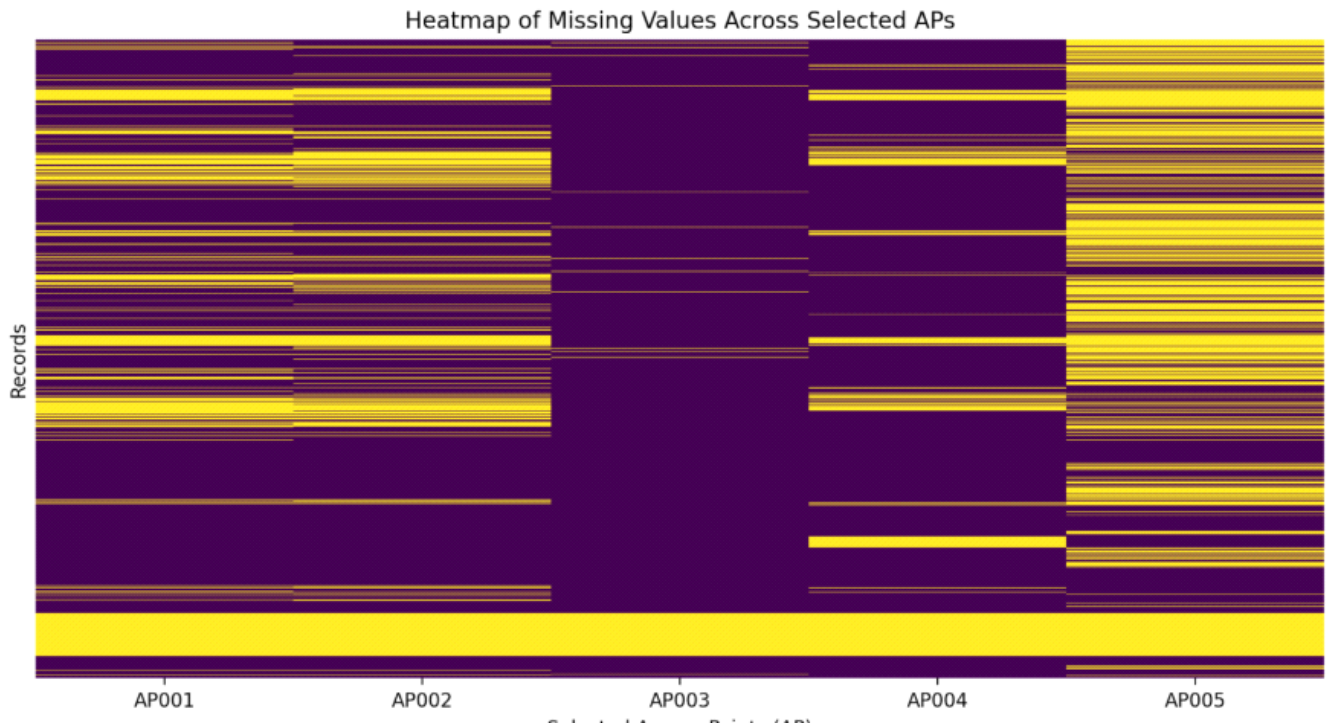
AP003 x

AP004 x

AP005 x



## Missing Values Heatmap (Selected AP Signal Strength)



**Drop columns:** The checkbox below allows you to drop Access Point (AP) columns where more than 95% of values are missing (represented by -110 dBm).

☒ Drop APs with more than 95% missing values

## Choose Analysis Type

Choose Analysis Type

Signal Strength Analysis



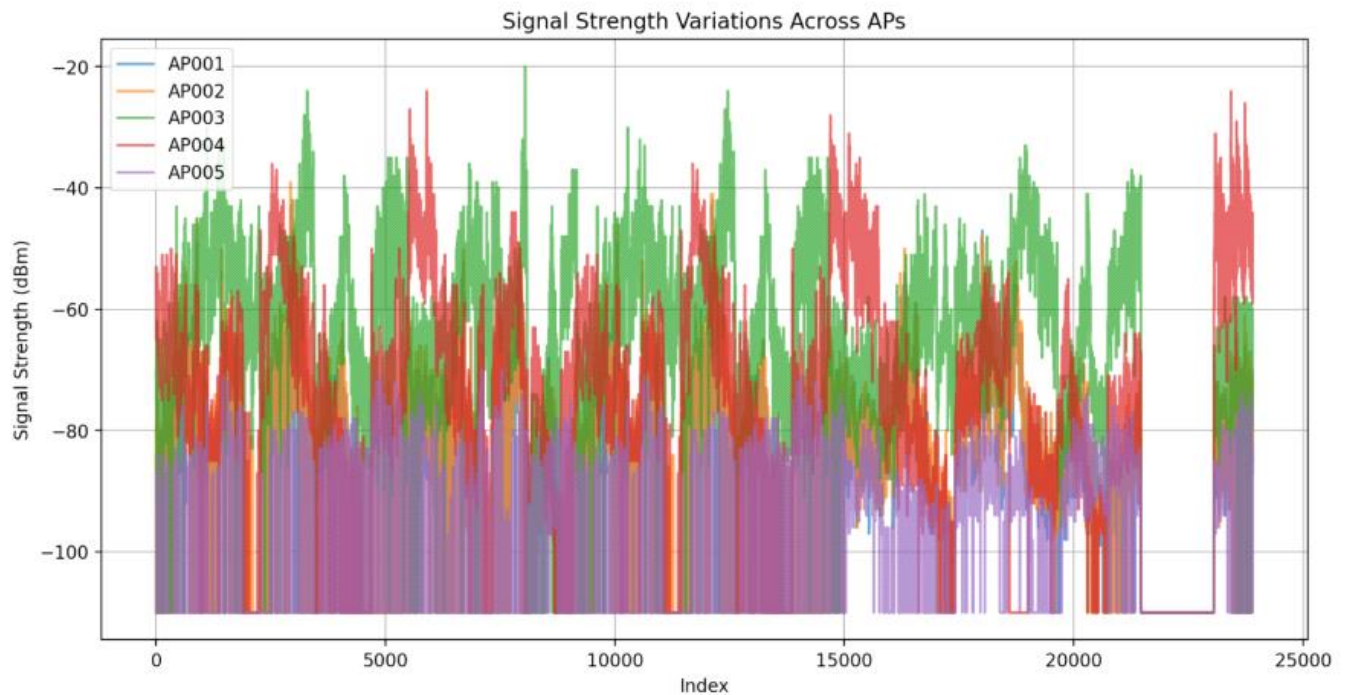
Signal Strength Analysis

Human Presence Trend

Device Analysis

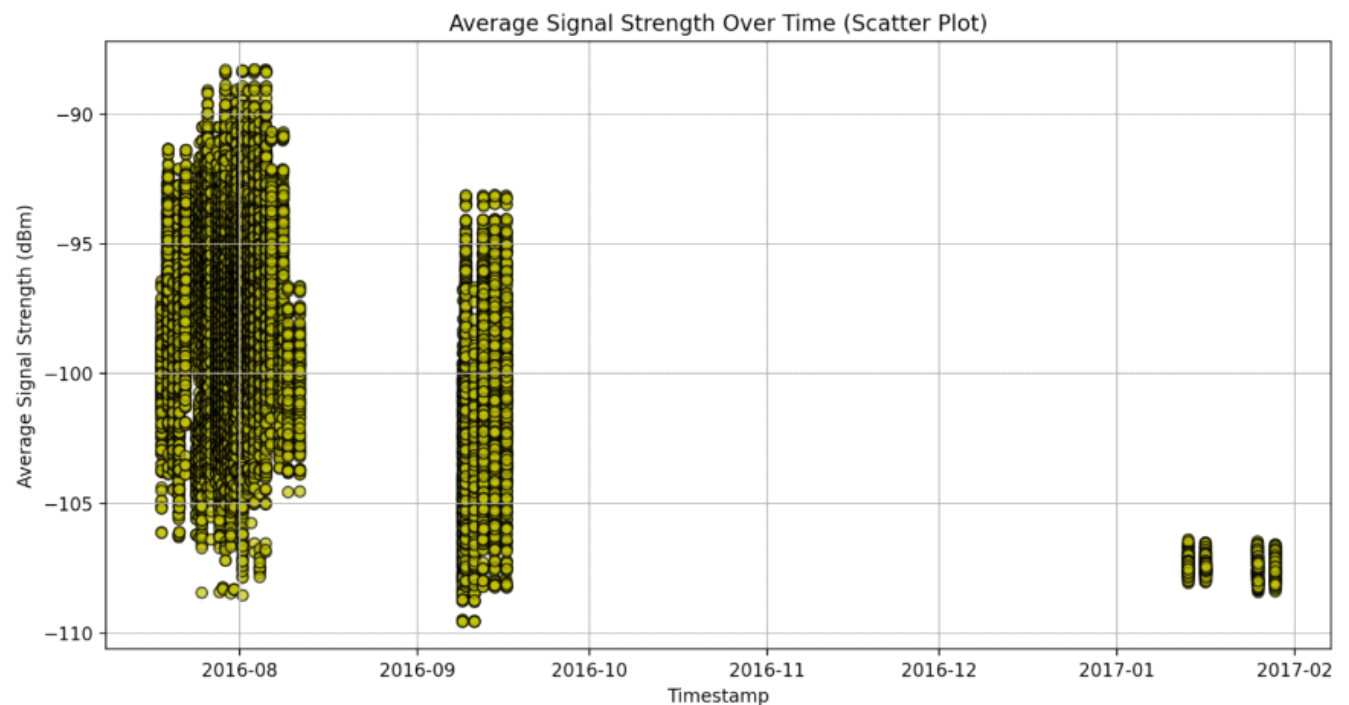
## Signal Strength Variations Across Selected APs

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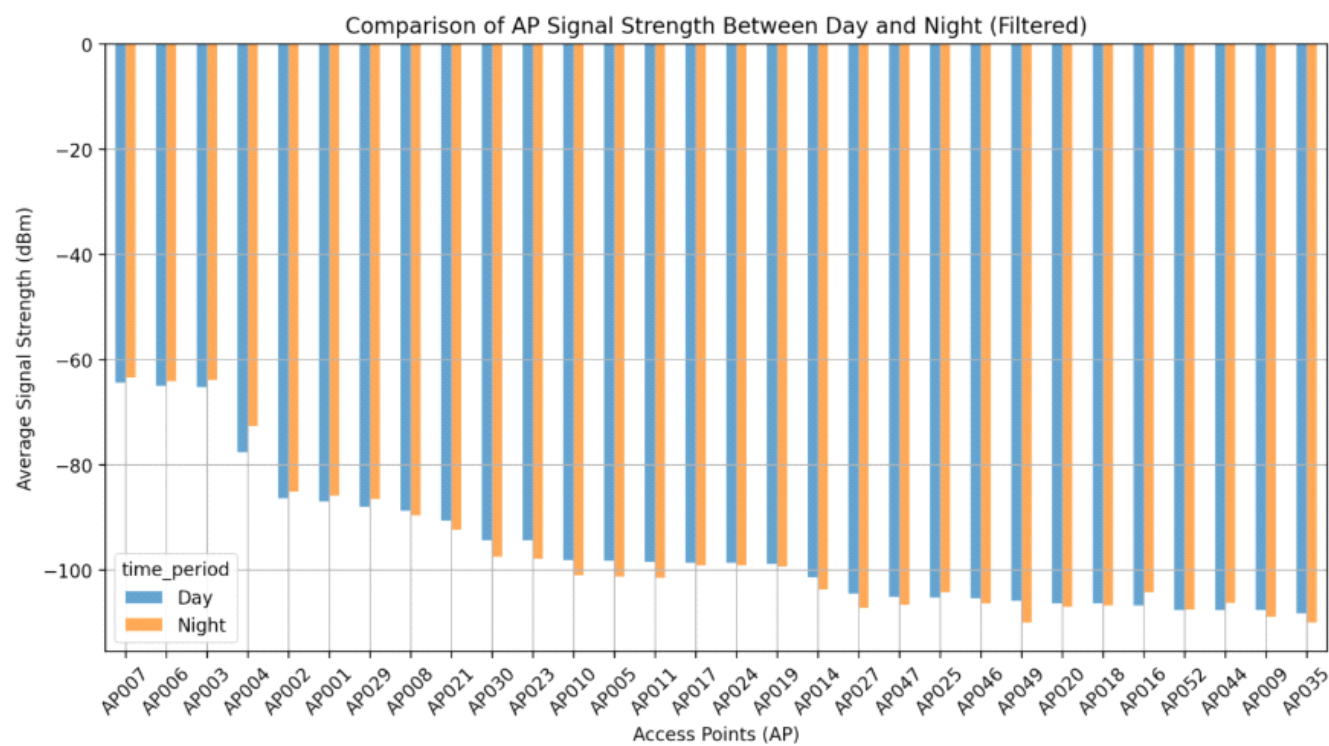


## Average Signal Strength Over Time

This graph shows the time intervals during which data is collected and average value of signal strength across various timestamps



# AP Signal Strength: Day vs. Night



## Choose Analysis Type

Choose Analysis Type

Human Presence Trend

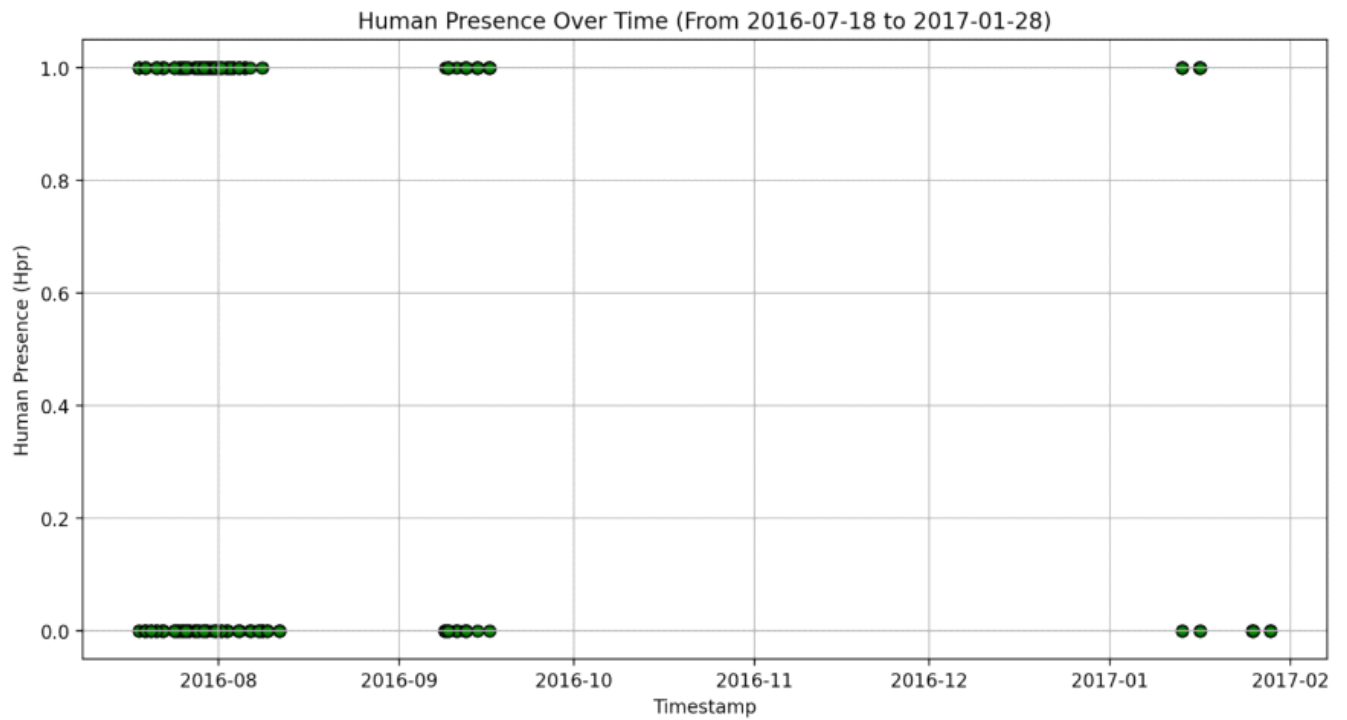


# Human Presence Trends

This graph shows human presence (1 for presence, 0 for absence) over time.

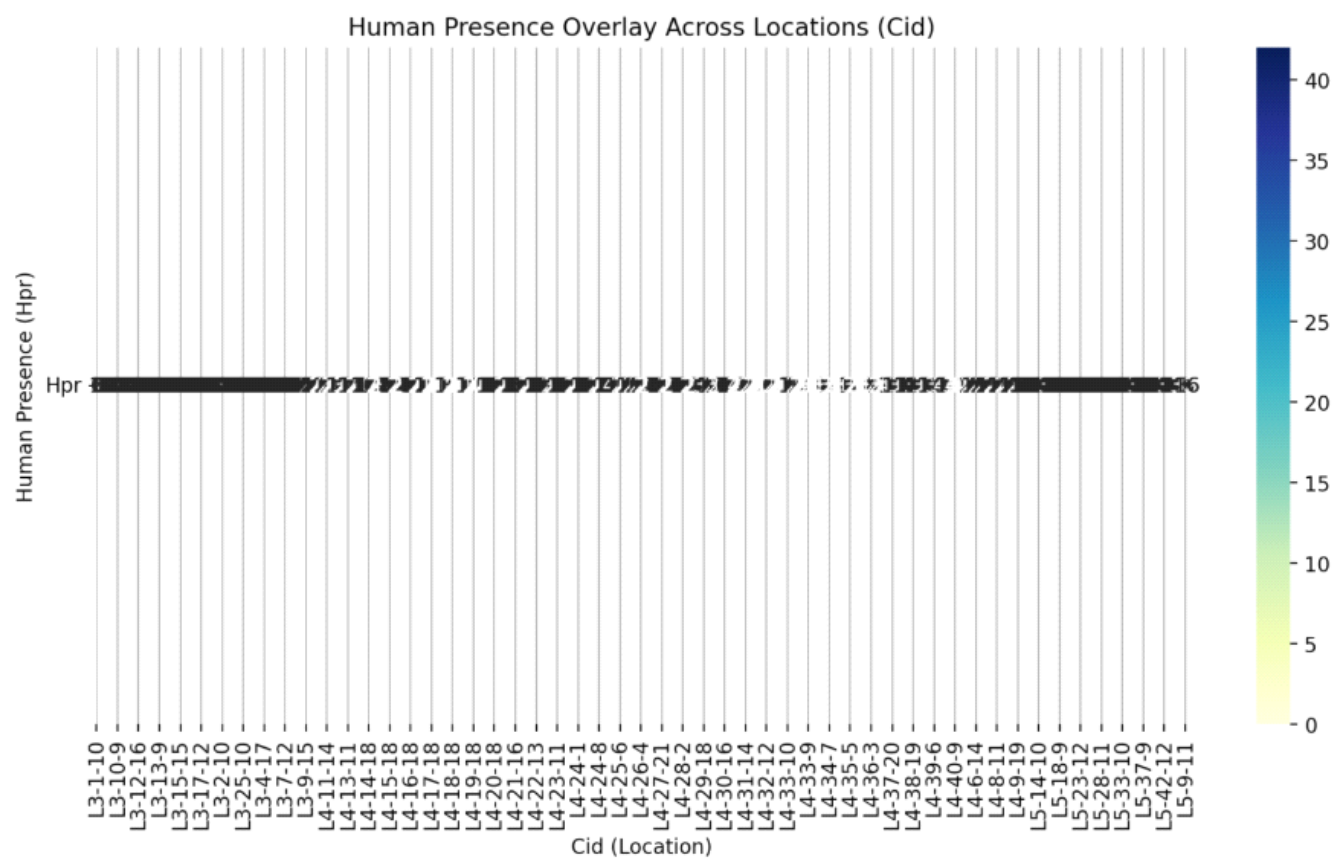
Select a time interval

2016/07/18 – 2017/01/28



# Human Presence Across Locations (Cid)

This graph shows human presence trend across various locations in the building.



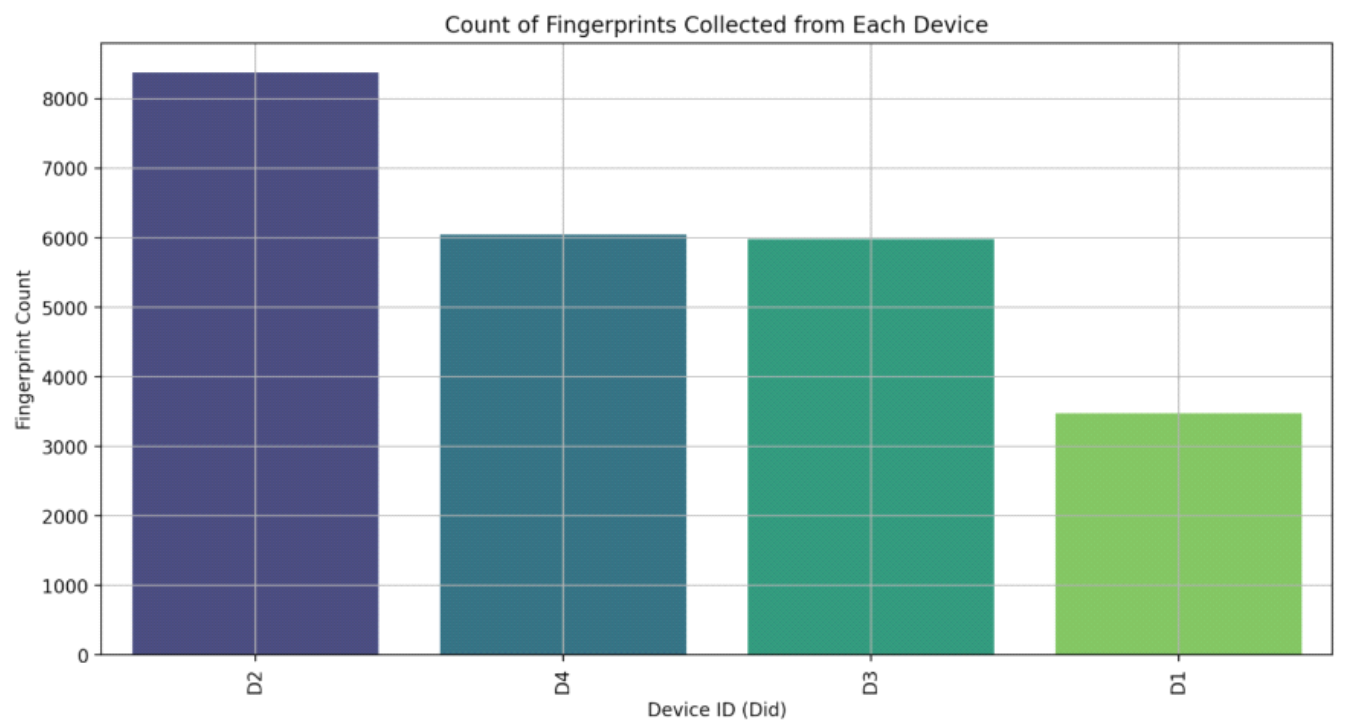


# Choose Analysis Type

Choose Analysis Type

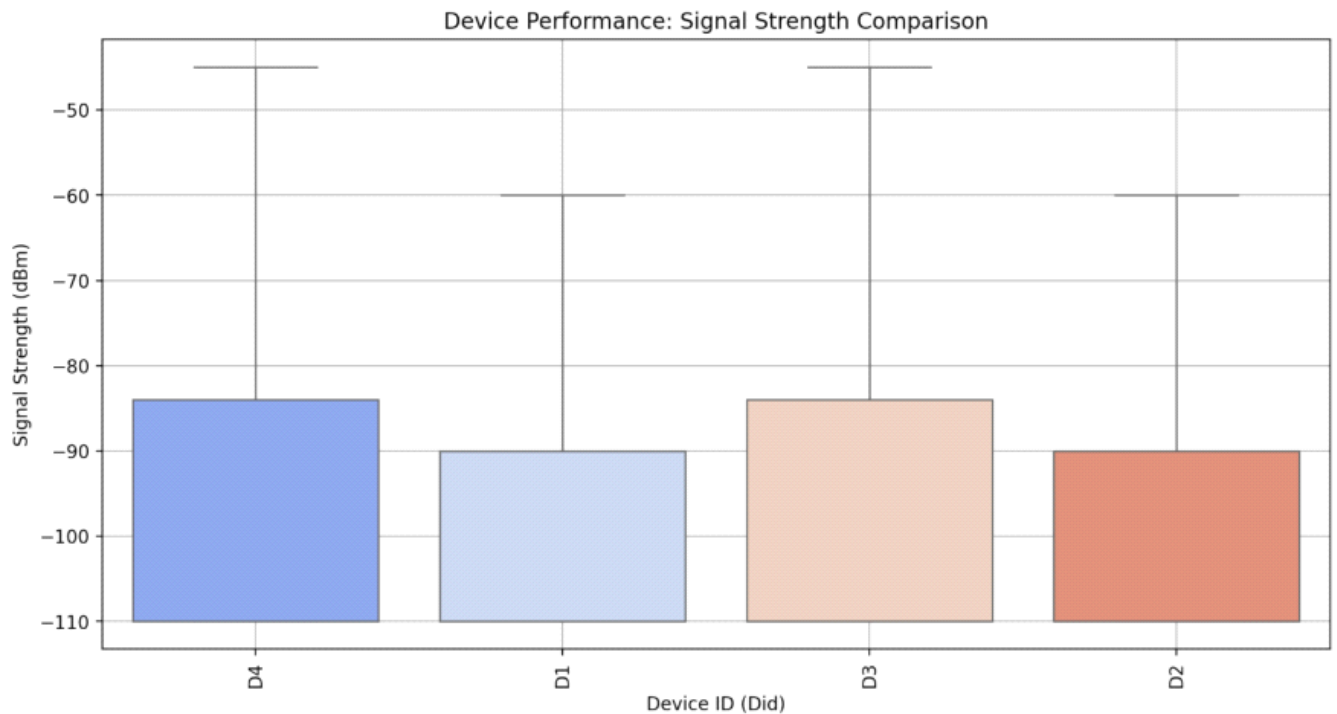
Device Analysis

## Bar Chart of Device Usage





## Device Performance Comparison (Boxplot of Signal Strength)



## Model Selection

Select a model to test

KNN



Model: knn\_model - Test Accuracy: 0.7355

## Model Selection

Select a model to test

XGBoost



Model: xgb\_model - Test Accuracy: 0.9095

# Conclusion

Three models(knn,random forest,xgboost) are trained on data. ensemble learning models(random forest, xgboost) performed well on data.

random forest accuracy: 94.48%

xgboost forest accuracy: 90.95%

random forest accuracy: 73.53%

