# Readme

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Here are some hints you need to know before using any part of this project.

## Common :

To run the project launch « main.py » which is located at : « Ev3Indoor/src/main.py »

To run the client, you need to upload it on an ev3 ( if it’s not already the case ) and launch it. You might have to install iw on you're ev3 (iw or iwconfig is used to scan RSSI from reachable WI-FI access points. Try « apt-get install iw » or « apt-get install iwconfig » to install it.

Small reminder : the project is made to connect devices who are used to scan RSSI (Received Signal Strength indicator) in order to form WI-FI fingerprint (https://en.wikipedia.org/wiki/Wi-Fi_positioning_system) it use those fingerprints to localise the devices.

Step 1 : Gather fingerprints with their location.

Step 2:  Make a new fingerprint without any knowledge of his location and use one of the machine learning algorithm to find the location of the device who made the fingerprint.  (tips : KNN is one of the best).

You might need to understand some basic knowledge of Machine Learning, make sure you understand the differences between « classification algorithms » and « regression algorithms ».

The gui part can be changed, just remind yourself that we used this gui as the front of the server. (for example to ask for a scan, it’s bind to a button or a key).

We have used a Lego Mindstorm EV3 dev but the server is done in such a way that you can use any kind of devices as long as you make a context for every device.

It’s quite simple juste do the same as the class **Ev3_Context** using the **Request** class. **Request** allow you to implement a simple factory in order to register different kind of frame.

By repository :

**- « bdd_save »**

Contains backups of specific areas and fingerprints made for testing, these fingerprints were made in room 2B051 of the Copernic building.

**- « bdd »**

Contains the bad backup, you delete it, at the start of the program.

**- « dataset »**

Contains dataset from the UjiIndoorLoc dataset, some of the files are only split parts of it like «TrainingData_b1f1 » contains only the fingerprints of the building 1 floor 1.

If you want to know exactly what contains this dataset check out :

https://www.kaggle.com/giantuji/UjiIndoorLoc.

**- « asset »**

Contains the images of the icons.

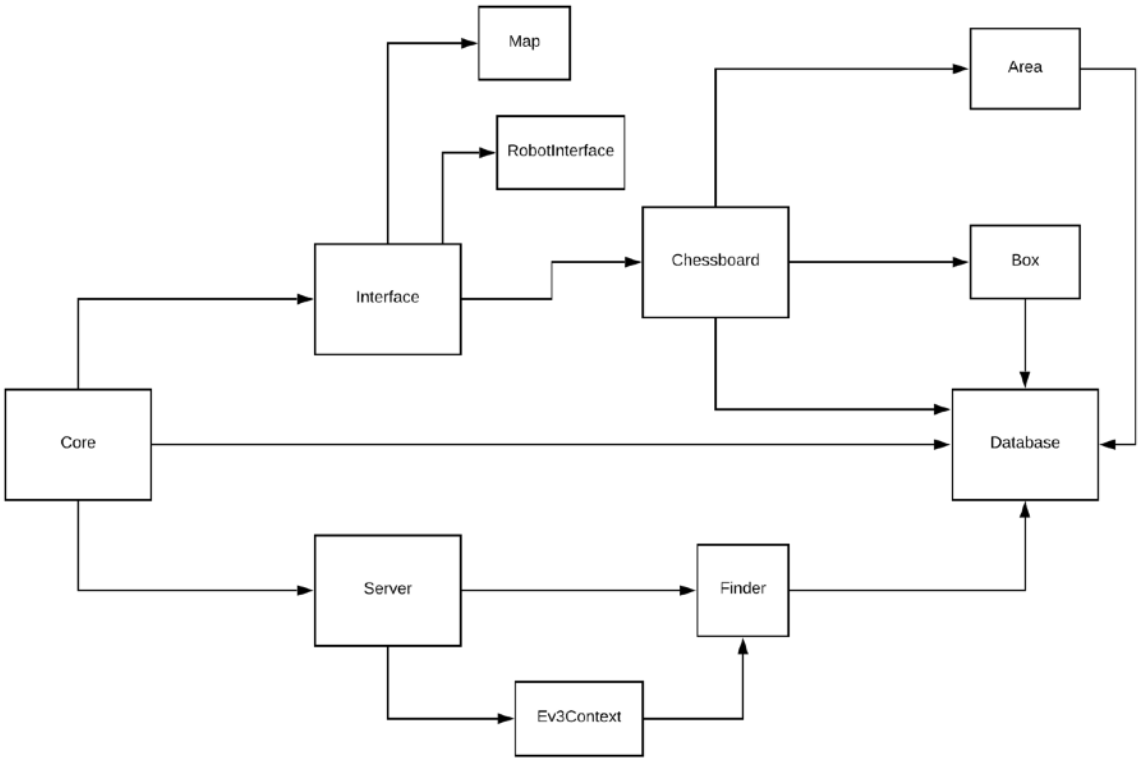
**- « src »**

Contains all source files.

# About Machine Learning

We use the Scikit-learn library, you can find a lot of examples and documentations at « https://scikit-learn.org/stable/ »

# Diagram




As you can see you can completely remove the gui part which contains the class **Interface Map RobotInterface Chessboard Area** and **Box** to make your own.