




ML4IoT Implementation of different projects

Edoardo Fantolino s286008





Data Science and Engineering,
Politecnico di Torino

Introduction

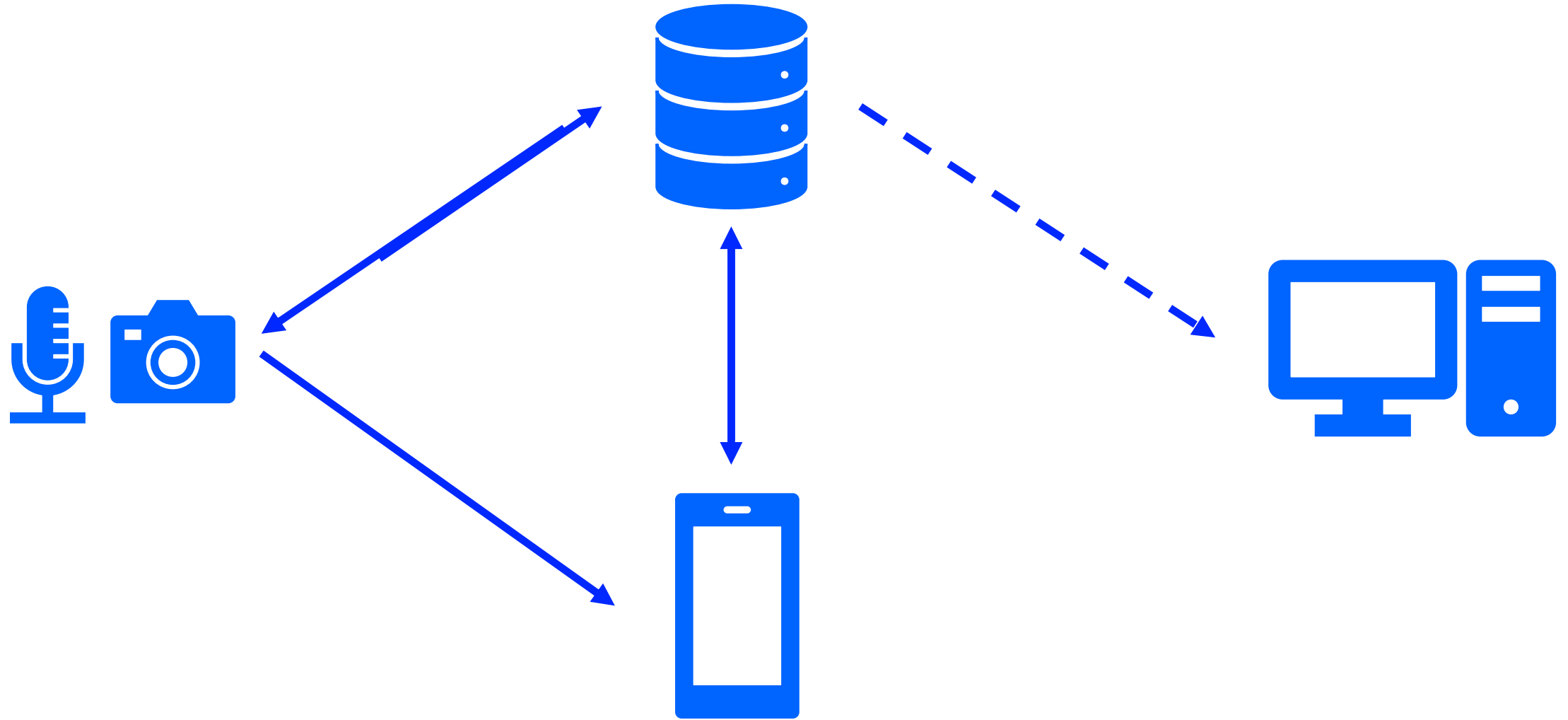
Use Deep Learning to:

- Recognize sounds 
- Classify images 

Connect Devices as:

- Cloud Servers 
- Sensors  
- Smartphones 

System interaction between sensors, server and smartphone



Sound Recognition and Classification

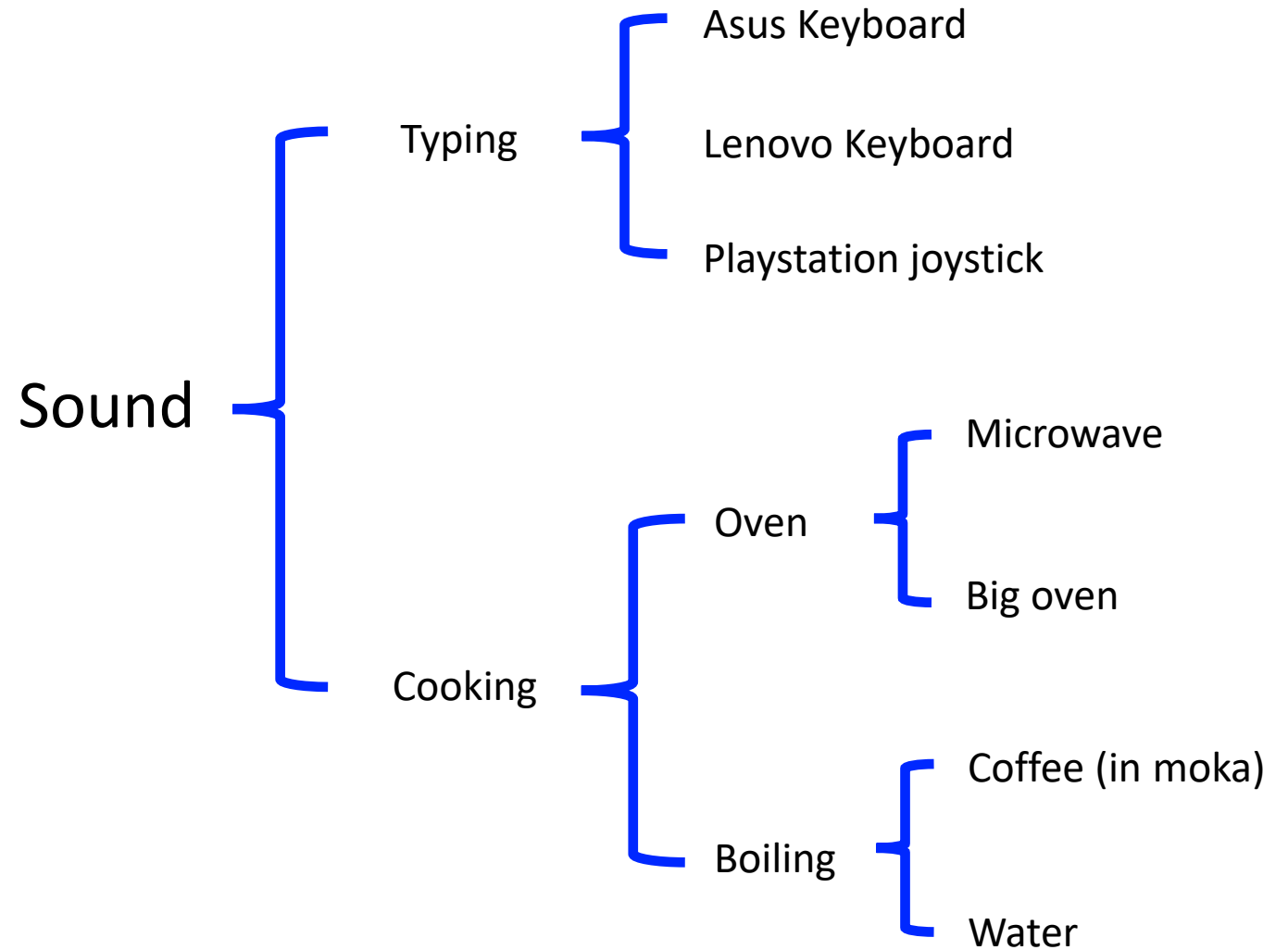
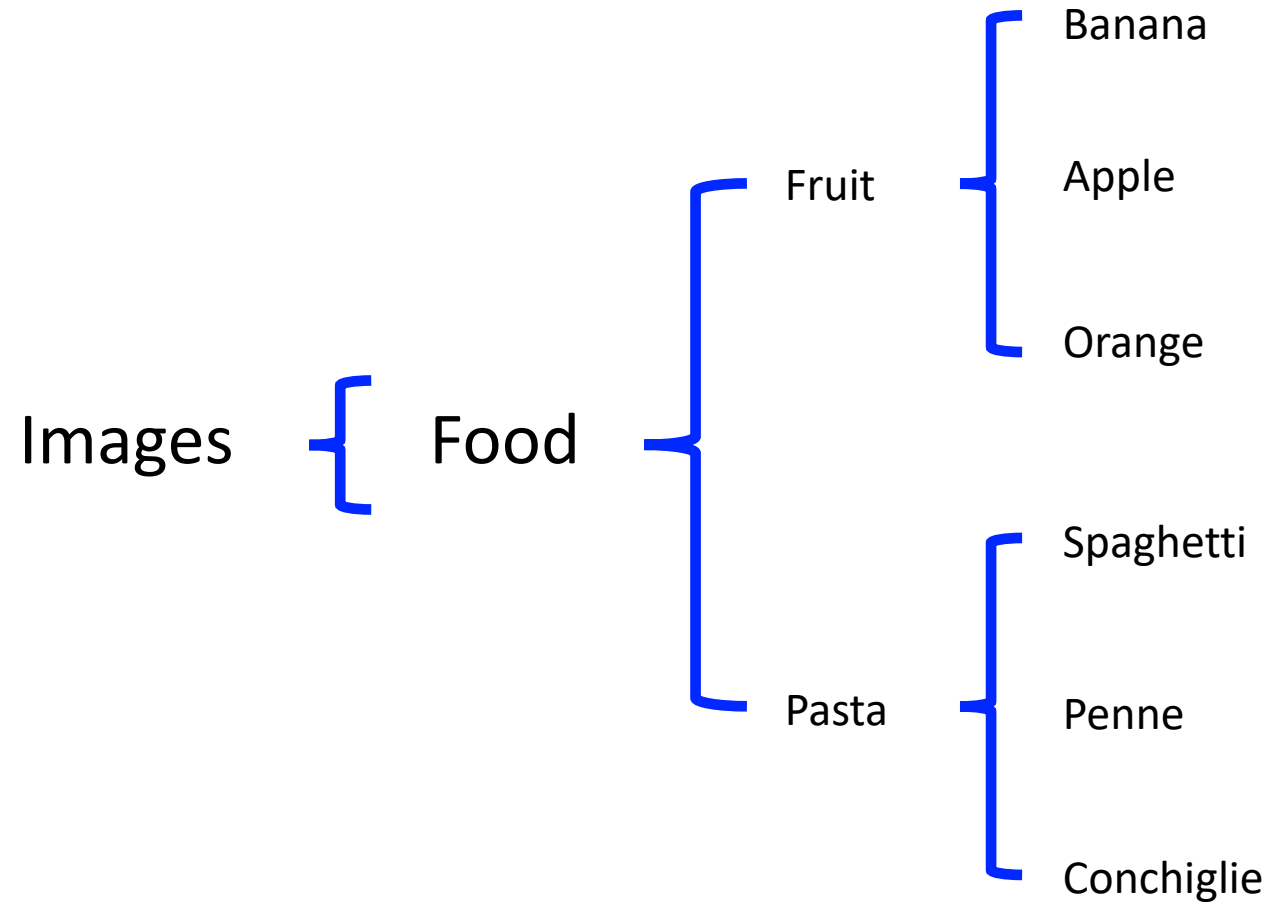


Image Recognition and Classification





THE SENSORS ALLOW TO COOK
MORE EFFICIENTLY



WE CAN KEEP TRACK OF OUR
NUTRITIONAL HABITS AND
TAILOR THEM IN CASE OF
NEEDS



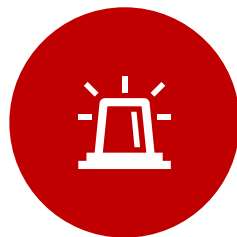
WE CAN BE HELPED BY THE
SENSORS TO COOK BETTER



WE CAN KEEP TRACK OF OUR
WORKING ACTIVITY



WE UNDERSTAND WHEN WE
NEED A BREAK TO PLAY
SOMETHING FUN



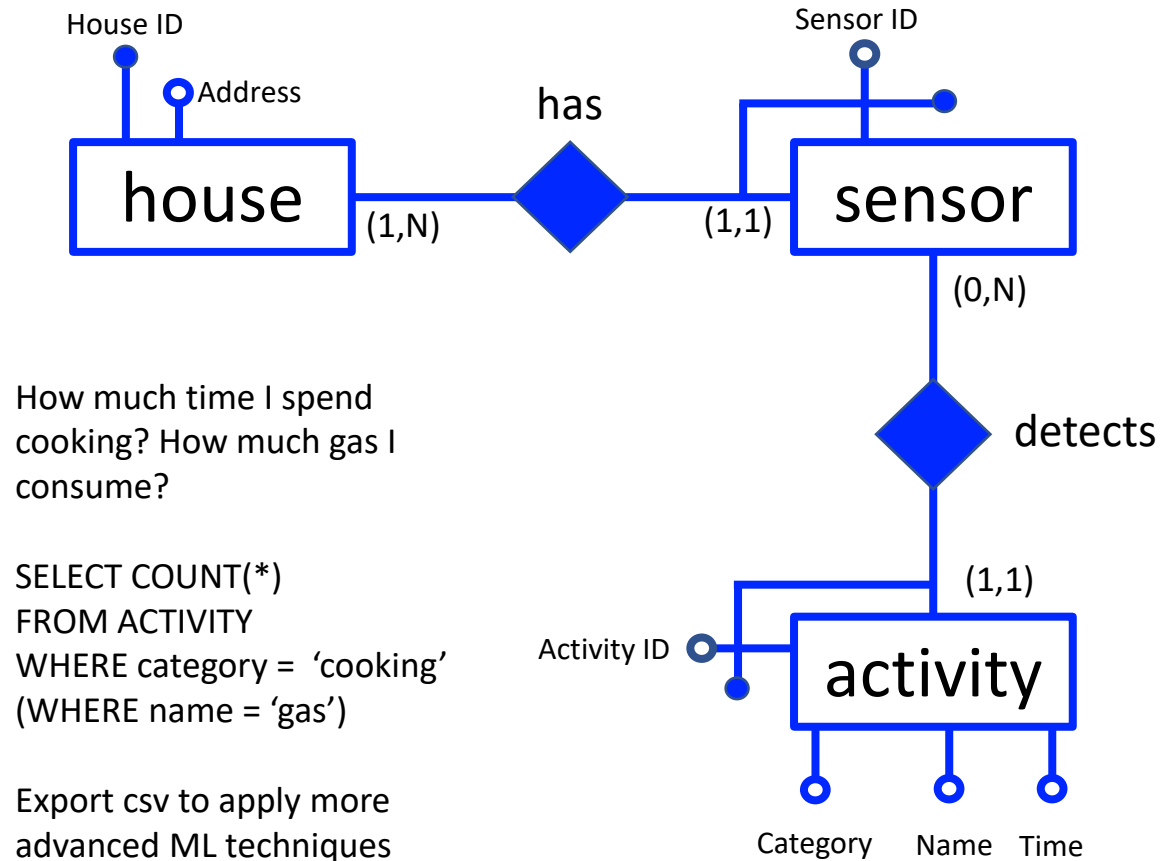
THE SENSORS WILL KEEP OUR
HOME SAFE WHEN WE ARE
OUT

Nutritional help

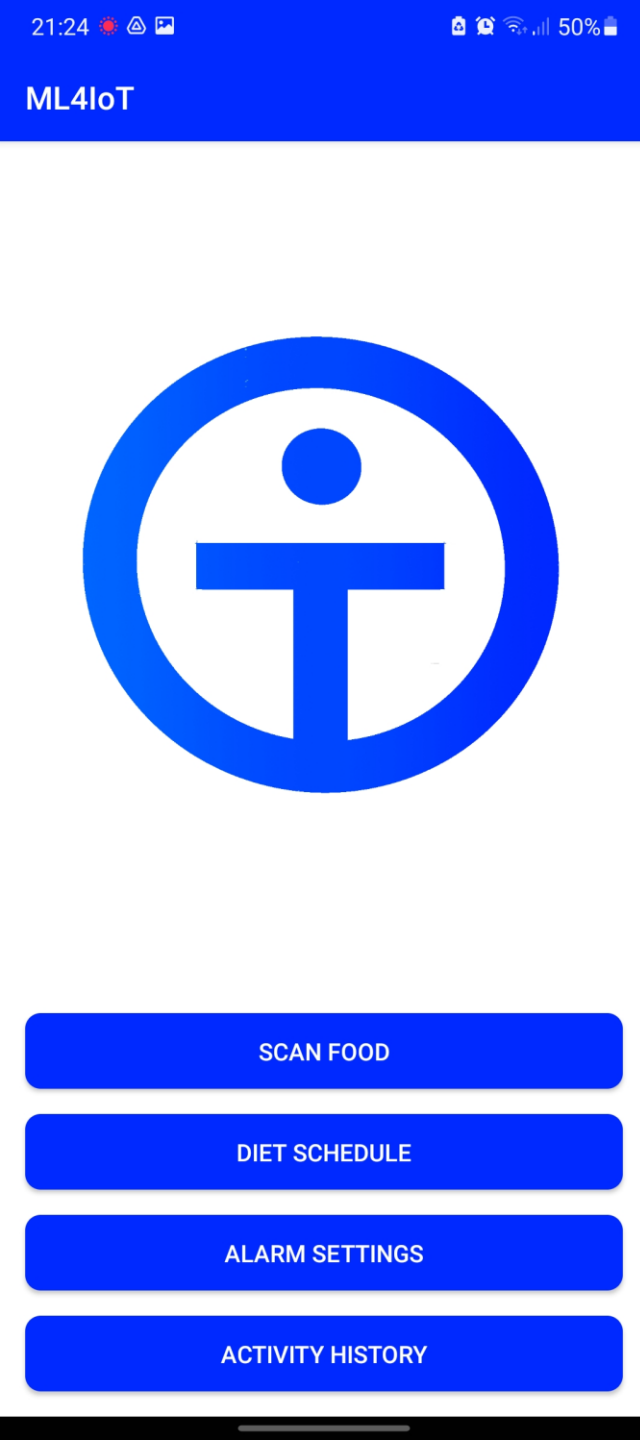
Activity tracking

Alarm systems

To store data and perform analysis a DBMS is created



aid	name	category	time	sid	hid
2111	microwave_oven	cooking	1640877987	1	1
2112	microwave_oven	cooking	1640877990	1	1
2113	microwave_oven	cooking	1640877992	1	1
2114	microwave_oven	cooking	1640877996	1	1
2115	silence_kitchen	NULL	1640877998	1	1
2116	silence_kitchen	NULL	1640878001	1	1
2117	silence_kitchen	NULL	1640878004	1	1
2118	silence_kitchen	NULL	1640878006	1	1



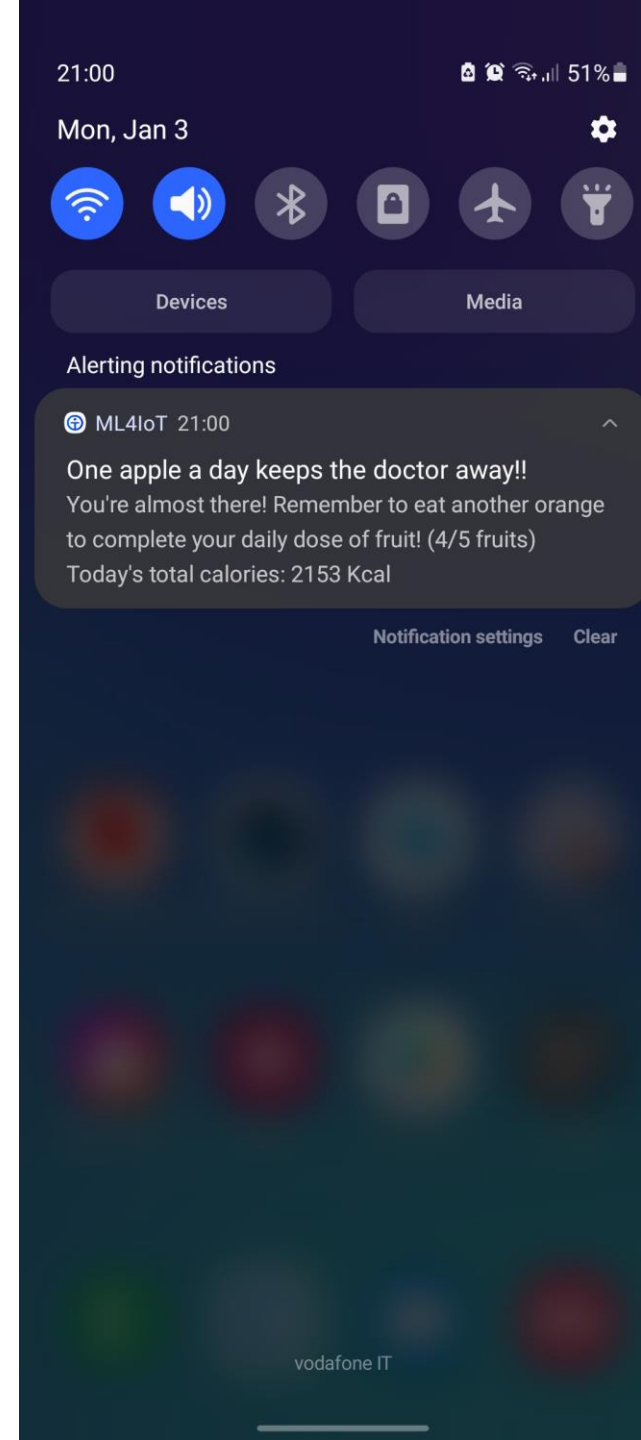
User experience is the core of our business

Mobile Application

The app makes the system user friendly.
The customers can easily keep track of
their activity

Notification System

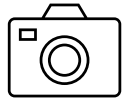
The notification alerting feature makes
the application quickly interact with
the user in case of need



Example of enhanced cooking



The microphone monitors the state of the water and as soon as the water is boiling a notification is sent to the user.



The camera sees the type of pasta and consequently how much time it should cook. After the correct cooking time is ended, a notification is sent to the user.

Penne 9 min.



Conchiglie 8 min.



silence



gas



boiling water



boiling water

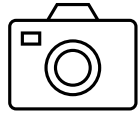


**READY
TO EAT!**

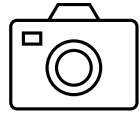
* = a notification is sent to the user



Example of food schedule and alerting



Apple, 08:30



Banana, 10:30



Apple, 13:30

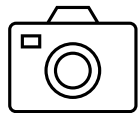


Orange, 17:30

H 21:00 and 4/5 fruits.

Notification:

You are almost there! Eat just another orange to reach the optimal daily dose of fruit.



Apple, 09:05



Banana, 09:10



Apple, 09:15



Apple, 09:20

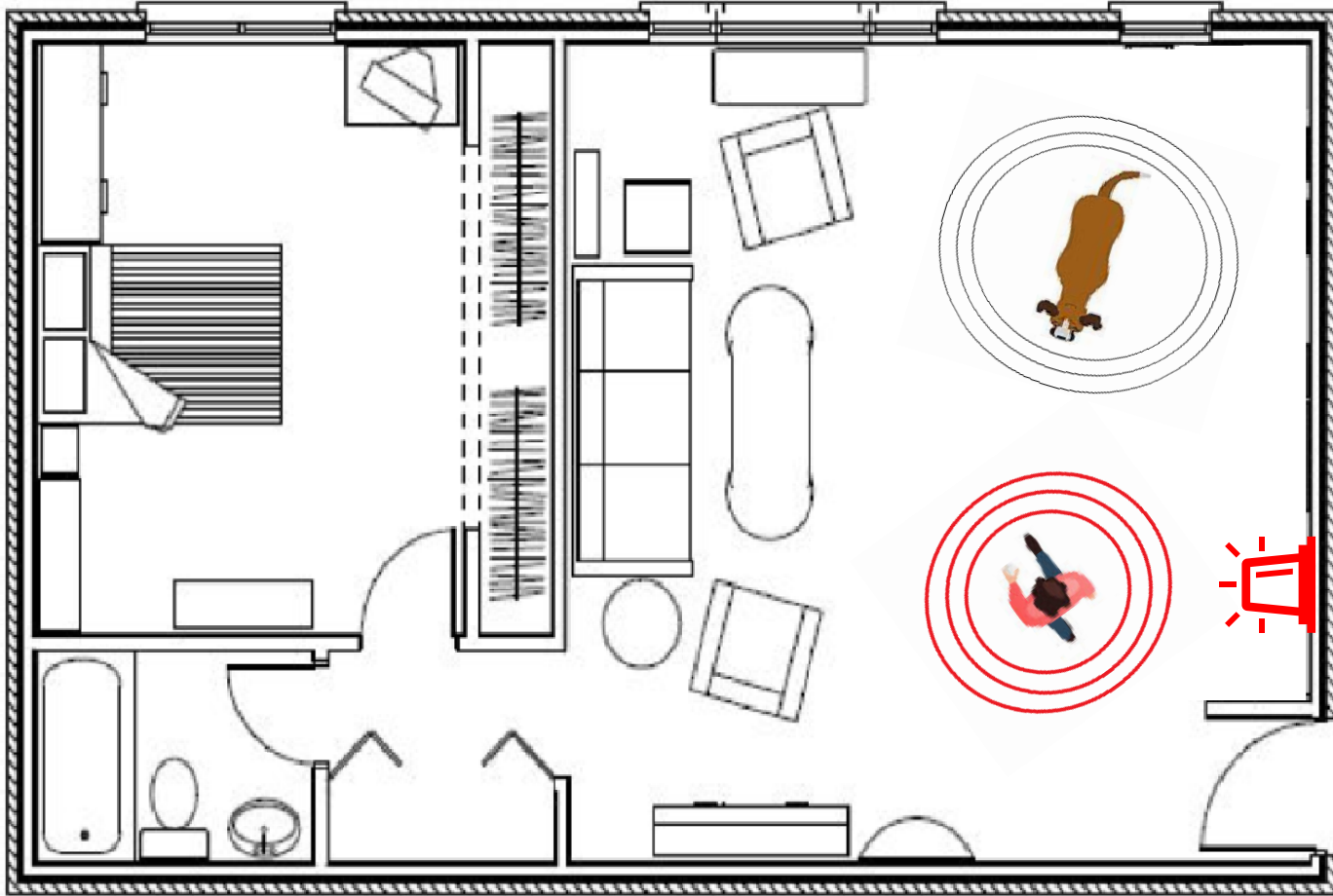
H 09:15:01.

Notification

Warning. Do not eat other fruits, your level of glucose could exceed the safe threshold.

Or: need another dose of insulin.

Example of Safety and Alarms



During a working day, you can turn on the alarm and the microphone will detect the sounds of the dogs as normal.

Instead, the walking noise of a thief/intruder and sounds like closing and opening doors will be identified as anomalies and the system will immediately send a notification to the user or directly to the competent authority.



Thank you for your
attention