Internet Of Things Project

specifications document:

SMART DOOR project

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1 General Introduction

Before arriving at what is currently called "connected key", the human being has tried by various techniques to secure his properties (house, money, car) and to restrict access by various techniques such as mechanical or electrical locking.
But in the air of big data and artificial intelligence, new solutions are presented. One of them is the connected keys.
In order to properly lead this project, we must rely on this specification document. The latter will be our guide to define the major requirements and objectives of our project. Thus, after highlighting the context of the project, we will focus on developing a functional analysis of our system through the use cases diagram. Finally, we will plan the main tasks using the GANTT chart.

2 Project description

We have presented various applications of the connected keys. However, in our project, we will focus on a specific application: The connected keys for opening/closing the doors.
Our project is the solution to several problems, for example:
- If you rent your house or apartment (through Airbnb for example) and you want the tenant to no longer access the apartment once his lease is over. Then you just have to forbid him to access.
- If you forget or lose your home's keys, when you have a person who's waiting for you in front of the house and you have to go back to open the door for him, or when you forget to let your keys to the plumber to repair a water leak... no problem! Use your smart key.

3 Targeted features

among the objectives of our project:

- If a person wants to enter and is recognized, the door open automatically (in our case a led lights up green).
- If the person is foreign (a led lights up red), a notification is sent to the owner of the house who can accept or refuse to open the door.
- The owner has the possibility to add this person in the list of people that the device can recognize.

4 Problem specification

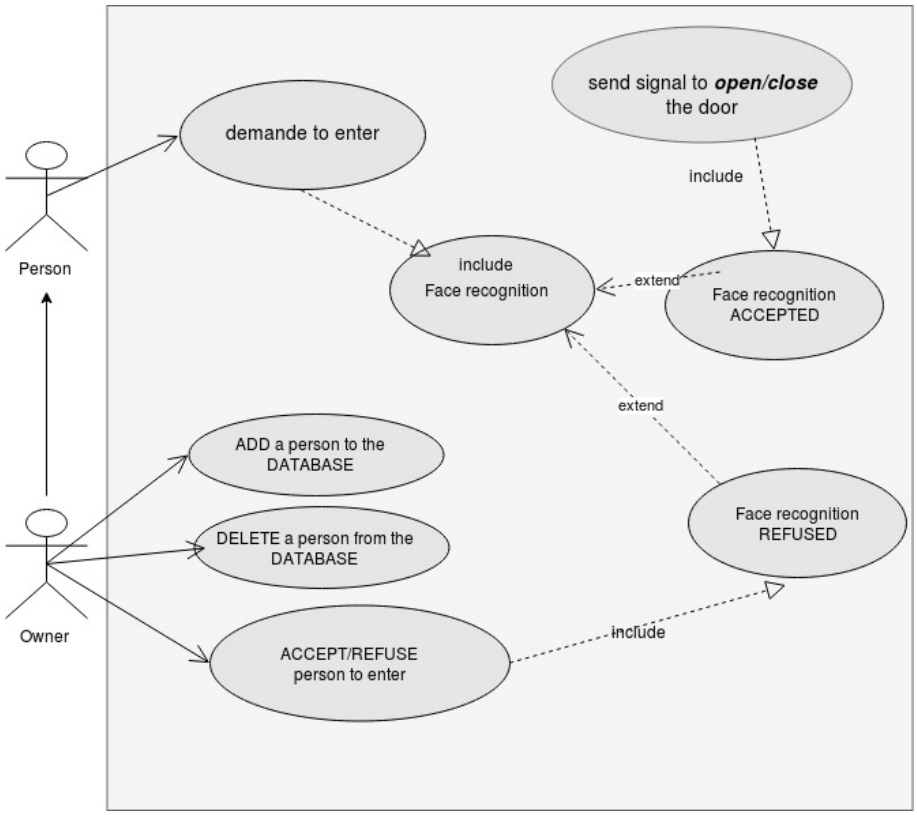
The success or failure of software project is determined by how clearly the problem is described at the beginning.
Despite the simple concept of our project, it conceals problems that must be taken into consideration:

- First one is to simply accept or refuse access. It may seems as an easy task but it hides a large volume of work behind.
- so we forbid accessing, but sometimes it may be more useful to prohibit it.

- Managing multiple access: you don't like your tenant to make a party in your apartment during your absence.

5 Use case diagram

In order to give you a general view of the main functionality of our system, we decided to introduce to you the use case diagram which demonstrate the different ways that a user might interact with the system:



6 technical specifications

in this section, we will give a brief view of the technical aspects of our project .
- First, the process of accept or refuse access is based on the face recognition which is a technique used to detect faces of individuals whose images saved in the data set. Despite the point that other methods of identification can be more accurate, face recognition has always remained a significant focus of research because of its non-meddling nature and because it is people's facile method of personal identification.
- Second, to recognize a face we will use deep learning techniques which is an artificial intelligence function that imitates the workings of the human brain in processing data and creating patterns for use in decision making. Deep learning is a subset of machine learning in Artificial Intelligence (AI)

that has networks capable of learning unsupervised from data that is unstructured or unlabeled.
- Third, our project is a device based on a micro-controller which is a compact integrated circuit designed to govern a specific operation in an embedded system. A typical micro-controller includes a processor, memory and input/output (I/O) peripherals on a single chip

7 Constraints

One of the major constraints of our project is the technical knowledge required :

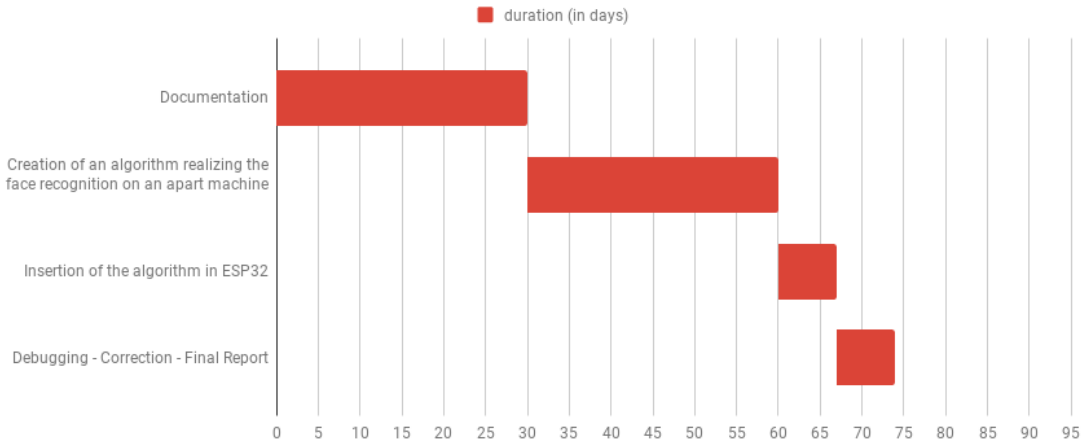
- in deep learning and the different Libraries.
- in micro-controllers.

Other constraints :

- Upon delivery of the specifications, we will have one month to make the project. The deadline seems short, given the technical complexity of the project and taking into account our busy schedule.
- Our budget does not allow us to buy more efficient components.

8 GANTT chart

This GANTT chart represents the list of tasks and their estimated durations. This diagram will allow us to better organize ourselves, and to have a schedule to follow regularly. It can be modified during the progress of the project depending on the difficulties encountered.



9 Conclusion

During this first study, we were able to implement our team spirit, as well as the skills we acquired during our training, particularly in software modeling and project management. The understanding

of the client's needs and the theoretical study of the project will allow us to have a solid base on which we will rely throughout the project to develop our application. Thanks to this, as well as to the planning of the various tasks, we hope to be able to fulfill the deliverable in proper time, with the quality that is due to them.