Facial Recognition
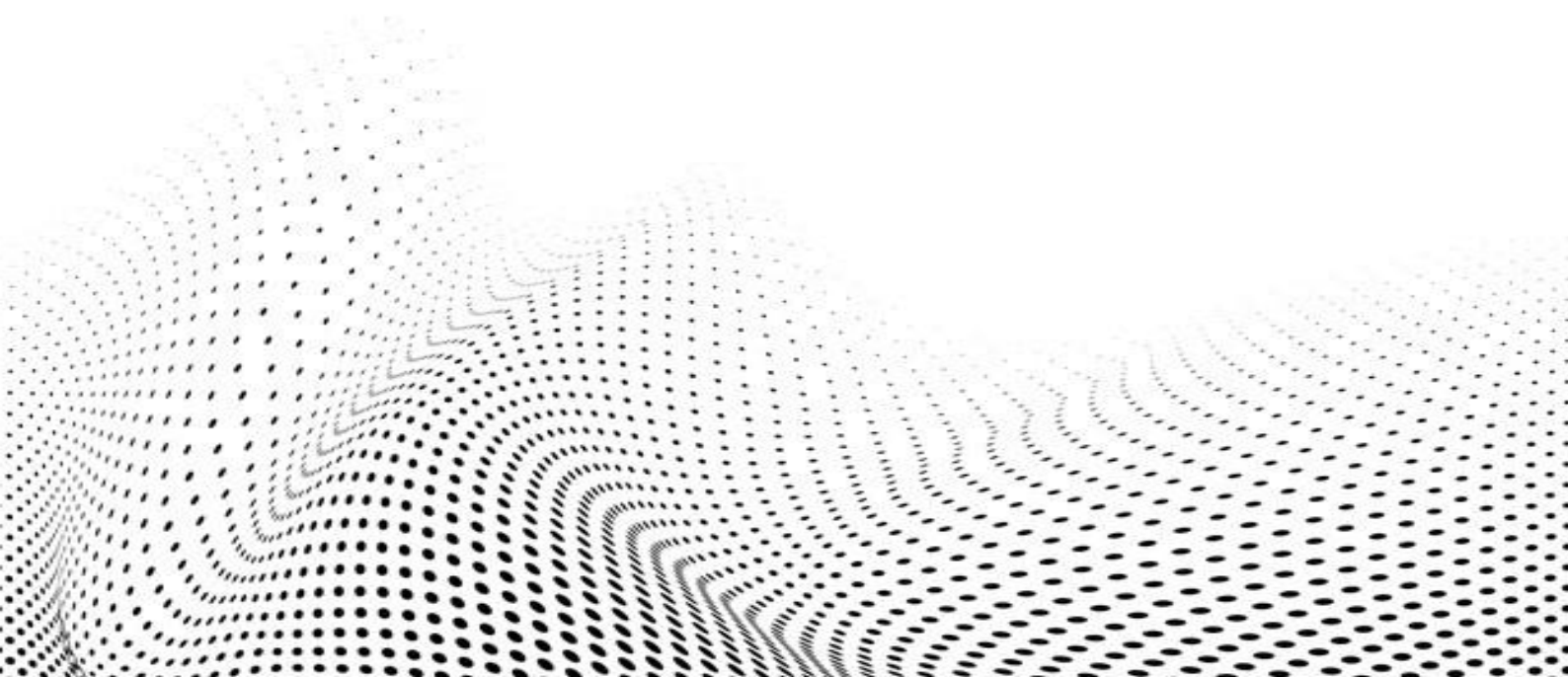
Paul BAGNIS, Jérémy RICHARD, François GUERN, Owain CHARLON, Aaron SAKSIK

Summary

I.   Context

a.   Description

Artificial Intelligence is a wave breaking over the modern world. Like passionate surfers, we cannot let it pass. This project is an **opportunity for us to increase our skills in this field**.

AI is also a subject of discord, there are many sceptics, **a better understanding** of it will allow us to give a more enlightened opinion on the subject.

Facial recognition is a **tool** that is increasingly used by companies and governments through surveillance cameras, and on a smaller scale in our phones (we use it to unlock certain smartphones).

The issue we want to address with Ydays 2020-2021 is the following: **How do facial recognition AI's work? How can they be used and for what purpose?**

Google and the innovations we have grown up with are of course a source of inspiration for this project.

b.   Objectives

In terms of realization:
        Make a remote access, with BDD, AI on remote server, API rest
        Make .exe files that send a picture to the API if face is recognized. It
        responds to it with the necessary data for displaying and editing notes.

In terms of development:
        The understanding and assimilation of the facial recognition process by an
        AI, as well as the functioning of the libraries and algorithms used form our
        guideline.
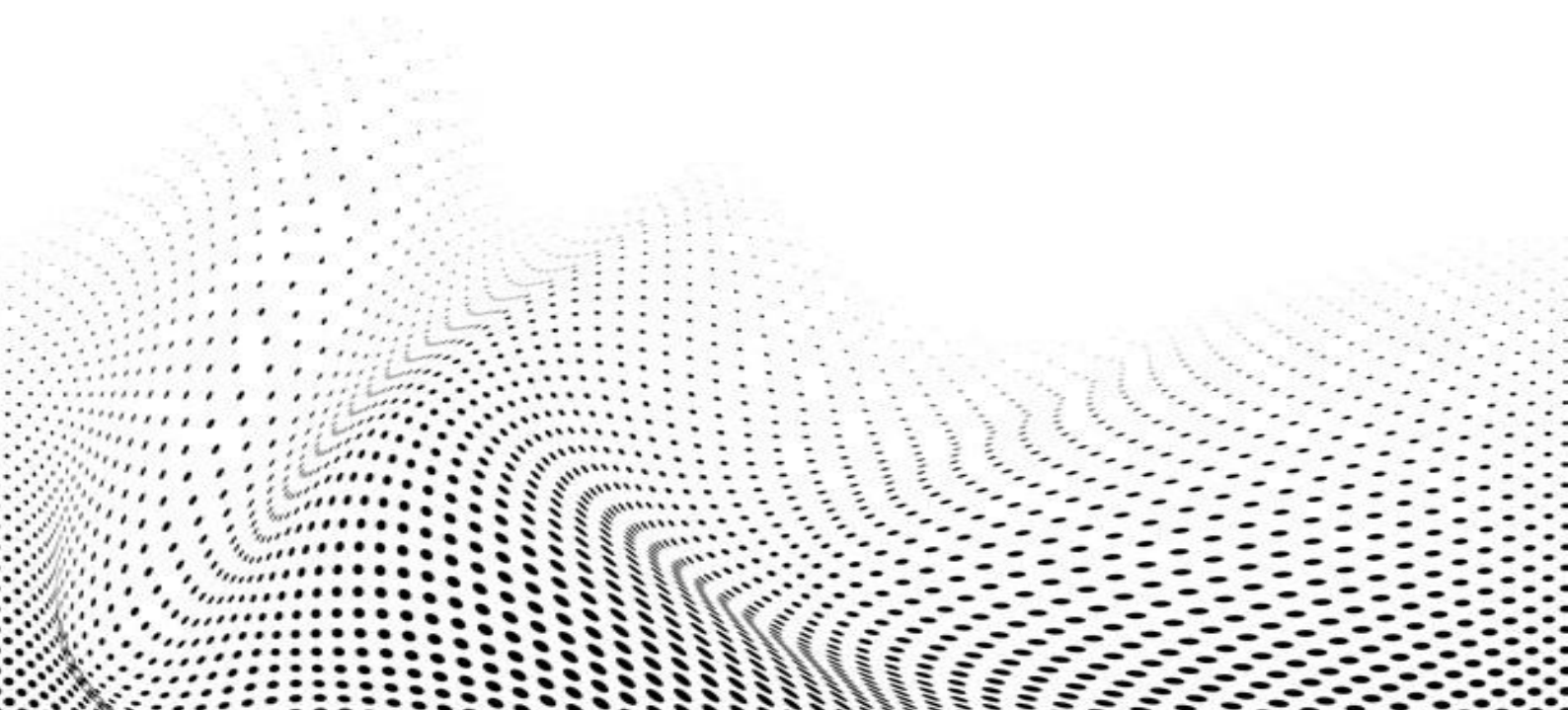
II.   The deliverable

This is a list of our deliverables:

- An notebook Jupyter
- A project summary document
- An executable (Client application)
- An gitHub with our AI and API.
- A dump of Database

We will provide a GitHub for the final rendering, where you will be able to find the whole project as well as a summary of the project in the form of a file.
We will also provide a PowerPoint with an oral presentation.

III.   The project stages

- Create a Python environment
- Choose technologies and libraries
- Set up a dataset
- Choose the used code, and detail it
- Rendering realization

IV.   Ressources

We will need a dataset, bibliography, and documentation. Moreover, we will need a quiet working space, and to be equipped with a computer each.
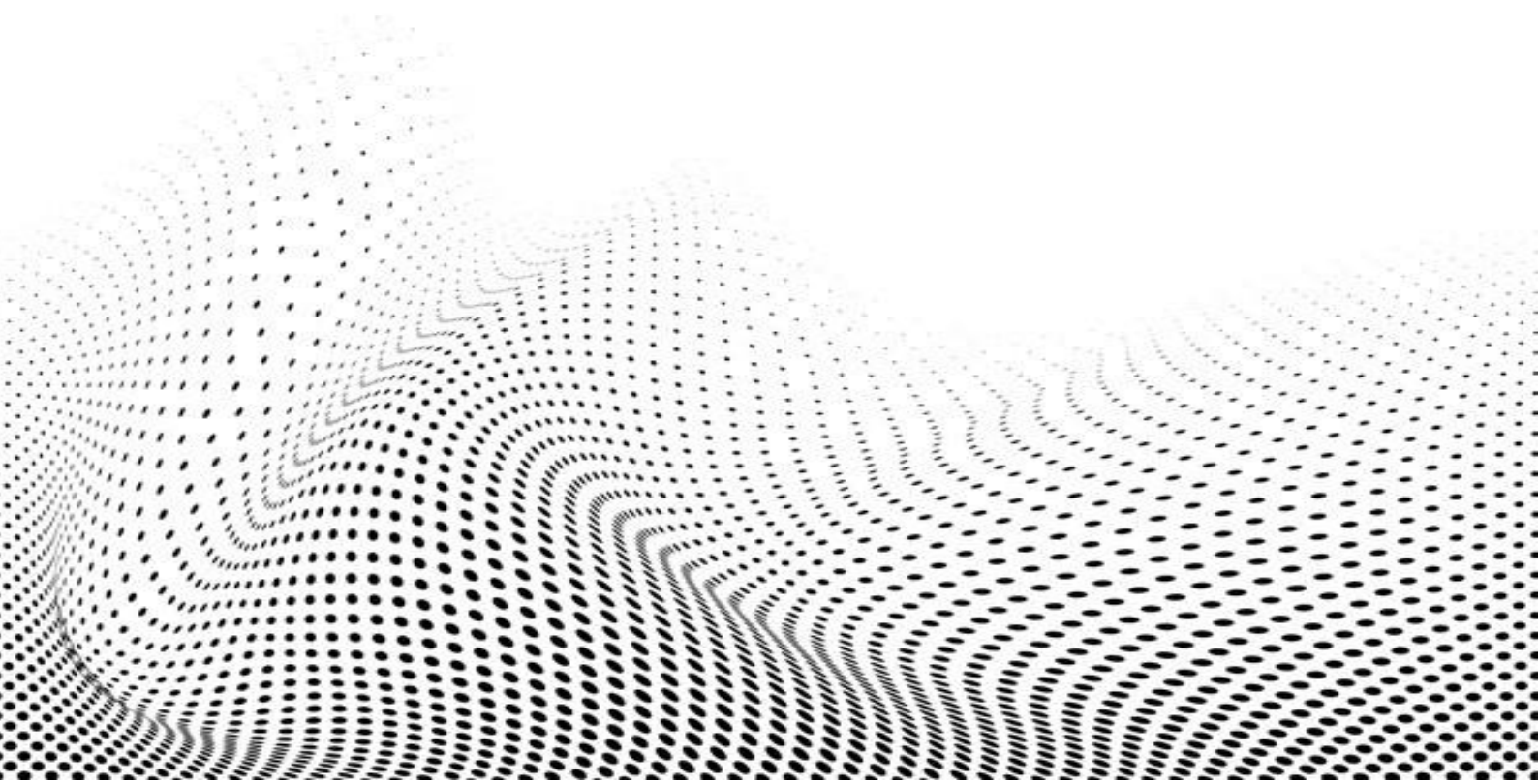
V. How it works

The tools used to carry out this project are:
- Discord to be able to exchange and have a channel to share documentation
- Trello for better project management
- Github to share a development environment and the code that will run in it.
- Google Drive for writing the deliverables and a documentation synthesis
- IDE : Visual Studio Code
- Python 3.9
- Libraries : TensorFlow, HttpRequest, Kivy

The architecture of our project:
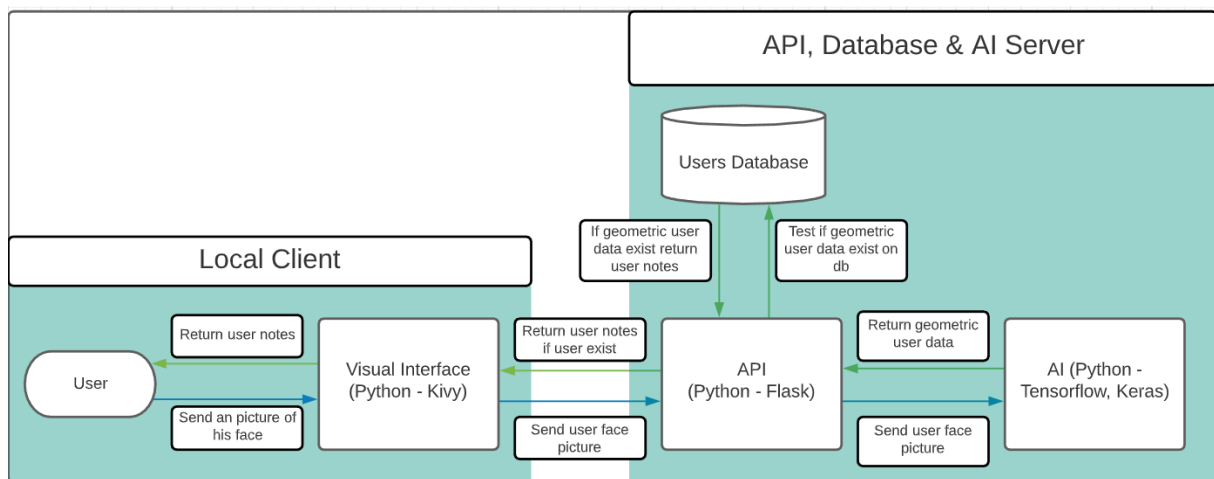
VI.   Tasks division

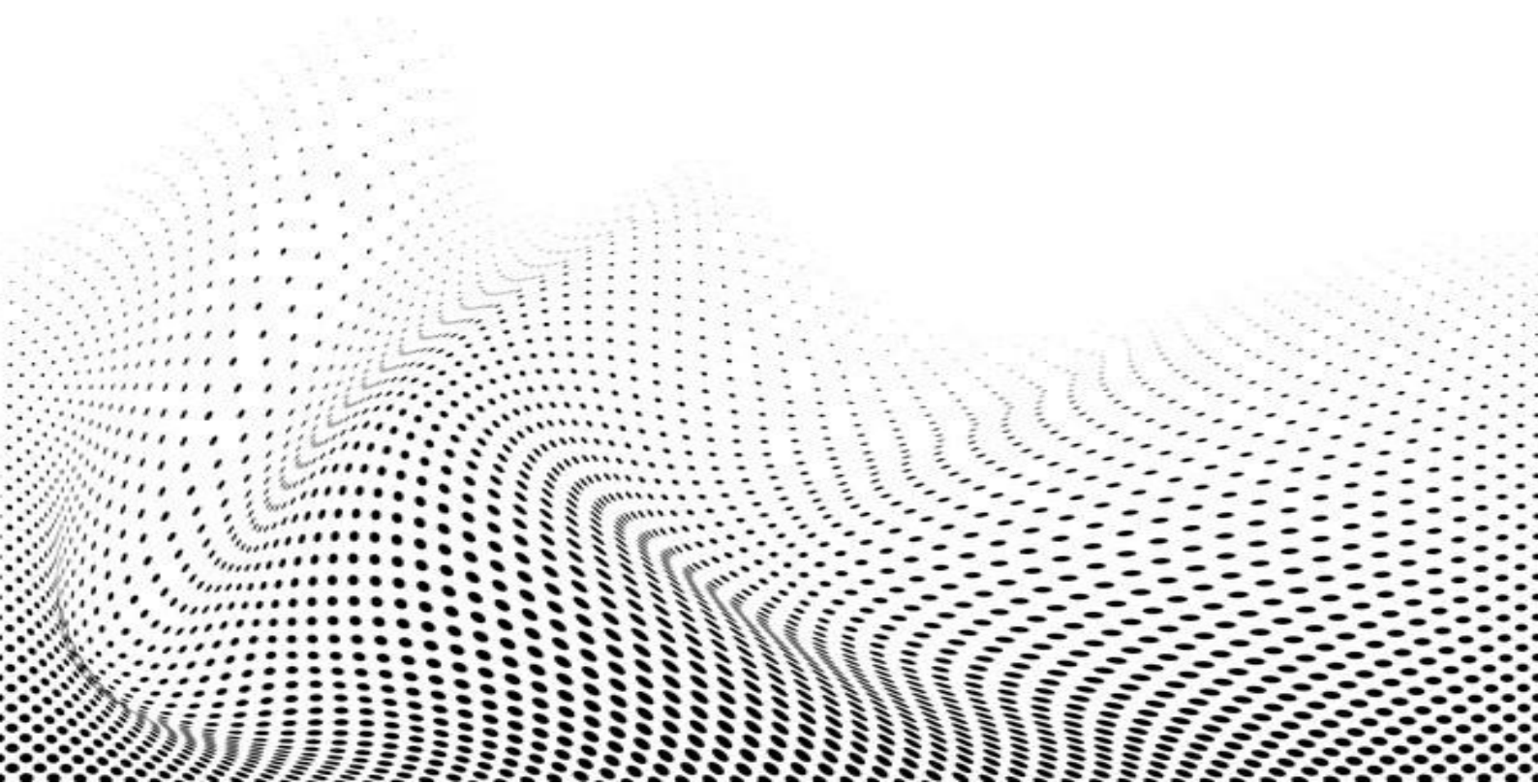Our team is made up of 5 people, the overall distribution is as follows:

3 peoples work on database creation, API Rest creation and software development (.exe):

- MLD, creation of the database and queries we will need and the python class for the ORM (1 day)
- Database data encryption (1 day)
- Modeling of the application + Flowchart (1 - 2 days)
- Find and document on a python library to make a graphical interface + development of the graphical interface (1 day of doc / 4-5 days of dev)
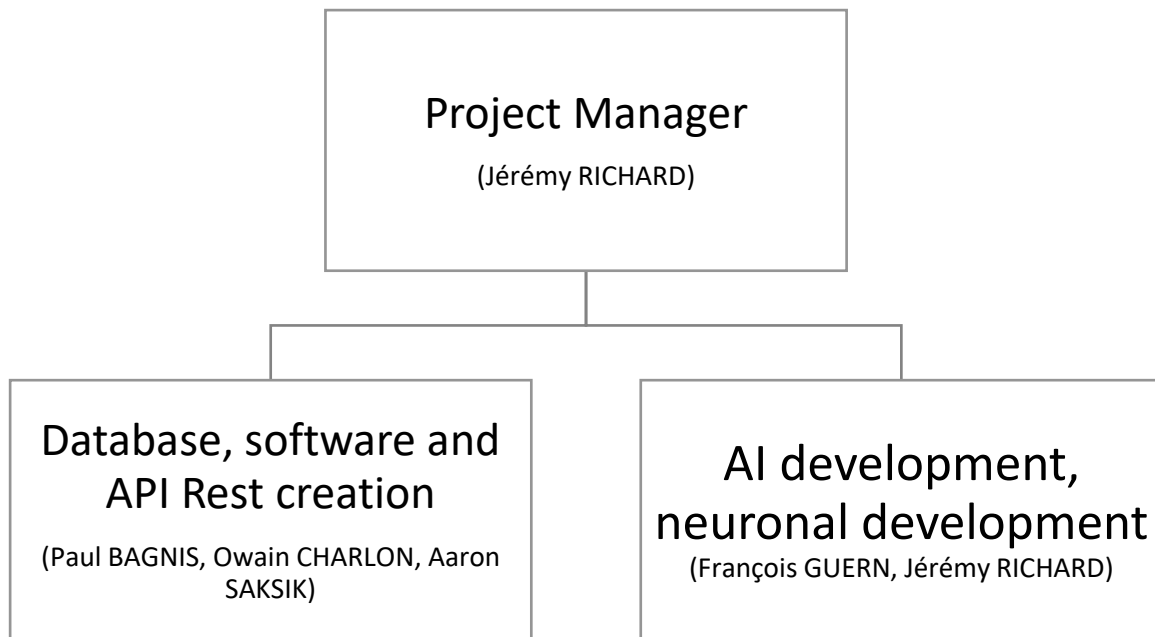- REST API creation (2-3 days)

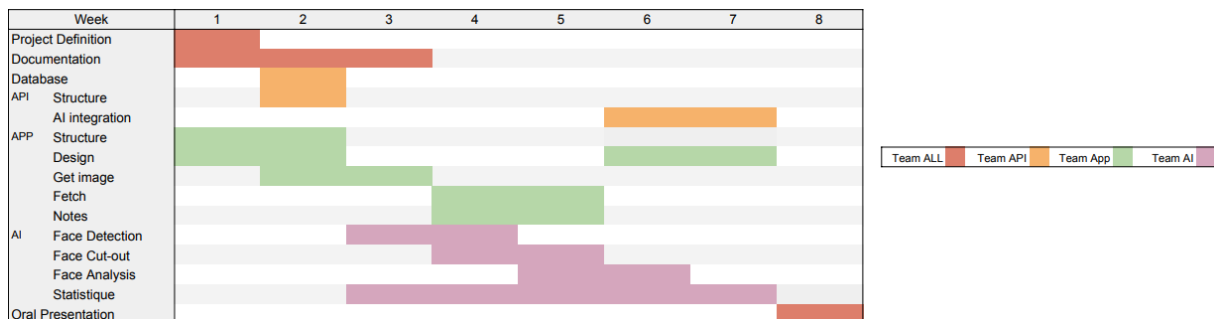2 peoples work on neuronal development.

VII.   Risks

- Lack of knowledge
- Insufficient time
- Too much documentation
- Dataset not complete enough for good training
- Advanced mathematical notions (matrix calculation)
- Link between REST API, DB and AI

a. Hierarchy

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                    ┌─────────────────────┐
                    │   Project Manager   │
                    │                     │
                    │  (Jérémy RICHARD)   │
                    └─────────────────────┘
                              │
              ┌───────────────┴───────────────┐
┌─────────────────────────┐     ┌─────────────────────────┐
│ Database, software and  │     │    AI development,      │
│   API Rest creation     │     │  neuronal development   │
│                         │     │                         │
│ (Paul BAGNIS, Owain     │     │ (François GUERN, Jérémy  │
│  CHARLON, Aaron         │     │  RICHARD)               │
│  SAKSIK)                │     │                         │
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VIII.   Planning

IX.   Interactions

We are several groups working on similar (facial recognition) projects, so we can help each other to achieve our goals. In the same way, we will help each other (between our two working groups).