Project Title: Advanced AI-Based Solution for Facial Recognition, Vehicle Number Plate Recognition, and QR Code Decoding.

Functions:

- Face detection and recognition using Artificial Intelligence
- Vehicle license plate detection and recognition using Artificial Intelligence
- QR Code detection and decoding using Artificial Intelligence

Purpose:

Use of Deep Learning algorithms for the implementation of a scalable, efficient, and accurate:

- facial recognition system for the control of access to private areas, the identification of people who do not respect the security measures in the HSE field.
- Vehicle number plate recognition system to detect the license plates in construction markets for tracking current inventory and identify products that need to be sold or replenished also to detect truck license plates on construction roads, this help keep up with ongoing work.
- QR code reading system to follow the daily activity whether employees or machines and vehicles and for the management of materials.

Inputs:

- The facial recognition model receives images from surveillance cameras as input.
- The license plate recognition model receives images from vehicle activity monitoring cameras as an input.
- The QR code decoding model receives images of vehicles or equipment equipped with QR codes as input.

Data Source:

- ***For the training phase:***
  - FR: data collected directly by installation cameras
  - ANPR: data collected either open-source data or acquisition of vehicle plates on site.
  - QR: data collected directly by installation cameras.
- ***For the production phase:***
  - EN: data collected directly by real-time installation cameras.
  - ANPR: data collected directly by real-time installation cameras.
  - QR: data collected directly by real-time installation cameras.

Process:

- Input image preprocessing
- Transfer input images to models
- Detection of the area of interest
- Identification (facial recognition), OCR (optical character recognition), Decoding (QR code)
- Data synchronization with JPass and EPE Project
- Cleansing, alerts, notifications, and data backup

Outputs:

- Data relating to the identified persons including their names, their status in the company, their jobs, the current project they are working on, images of faces, contractors, badge identification etc.
- data relating to identified vehicles including their plate numbers, type of vehicles, serial number, driver, what they carry, type of equipment, images of their plates etc.
- Data on employees who do not comply with seams or safety standards.
- notifications and alerts about identified issues.