

# Automated Passenger Desk Kiosk



## Project Objective:

The objective of the automated passenger kiosk desk is to provide passengers with an easy-to-use means of validating their boarding pass to board their flight without the need for human assistance. The kiosk will use computer vision to confirm the details of the passenger using their ID, boarding pass, and facial recognition technology.

In full working condition, the kiosk should have the following functions:

- Passenger will be able to use their digital ID and boarding pass to confirm their booking on the flight manifest. This is done using computer vision that extracts textual information and compares the two documents.
- The kiosk will record a 15-second video that will be analyzed for facial image data to be compared with the facial image on the digital ID.
- The passenger will present their hand luggage to rule out the presence of a lighter (prohibited item on plane).
- Once all steps have been completed, a validation step will be used to allow or deny the passenger onto the flight.

## The simulated kiosk experience can be created as below:

1. There will be 5 passengers with fabricated names, dates of birth, flight information added to the flight manifest – the bookings for the flights.
2. The 5 passengers will have fabricated ID's using pseudo-information like what one can find in ordinary ID's. The faces will be generated using artificial intelligence from the [This Person Does Not Exist](#) site. The site generates realistic human faces of people that do not exist. This allows us to complete the project without worrying about asking for permission to use people's images.
3. Boarding passes of the 5 people will be created using pseudo-information.
4. The faces generated will have their background removed and replaced with a background of an airport.
5. Once the background is removed, videos of non-existent people will be uploaded to [myHeritage.com](#). Here the images will use artificial intelligence to generate 15-second videos of moving faces which will be perfect for simulating the onboarding process at an airport.

6. Images of the baggage items from the passenger has been provided by Udacity. These images will be processed by an object detection model, and a prediction will be made as to whether a lighter is present in the image or not.
7. The entire process will use Azure Cognitive Services to automate the process.

### **Input Data Sources:**

- Flight bookings of passengers x 5
- ID cards x 5 (including one face photo for the project owner)
- Boarding Pass x 5
- Passenger video footage x 5
- Passenger carry-on items photo x 5

### **The Solution Strategy:**

- **Azure Form Recognizer service** will be used to extract digital ID information using prebuilt models. Boarding passes will have a custom-built text extraction model to deal with the required boarding pass format.
- **Azure Face API service** will be used to extract facial image data from the digital ID and compared to the facial image found in the video of the corresponding person.
- The video from the passenger will be uploaded to the **Azure Video Indexer service**. Here computer vision will extract both the facial features of the passenger and additional information such as passenger sentiment.
- **Azure Custom Vision Service** will be used to train a model to identify the presence of a lighter (prohibited item) in the passenger luggage. If there is a lighter in the hand luggage, the passenger will not be allowed to board the flight.
- Once all the passenger information has been gathered, a validation check will be performed. The program will run through the flight manifest and compare information gathered by each service such as the booking details, boarding pass details, digital ID details and facial recognition data.
- After all has been compared, the program will output a message that confirms their onboarding process has been a success or whether their details do not match with flight information.