

Project Problem Description

Project Objective

The objective of this project is to develop a prototype of an automated passenger boarding kiosk using computer vision on AI based to assist pre-flight procedure performed before onboard the plane. The automated solution will assist airline passengers without any human assistance in multiple functions like identity verification to board the flight, automated customer feedback collection, passenger carry-on items verification and boarding process.

The kiosk prototype should have the working condition below:

- Passengers will be able to use the kiosk to scan their identification (ID Card) and boarding pass;
- The Kiosk prototype should be able to process passenger information extracting data from the boarding pass and comparing it with the ID card to verify the information provided;
- Additionally, the kiosk prototype will be able to capture a brief 30-second video of the passenger, performing a facial recognition to ensure that the passenger face matches with the presented ID Card;
- Passenger emotions will be detected in the same video captured in the previous process;
- Moreover, the Kiosk prototype will be able to conducts scans of carry-on luggage, swiftly identifying any prohibited items, such as lighters;
- Upon successful completion of all checks, the Kiosk prototype will warmly notify the passenger that “He/she can board the plane”. However, if any issues arise during validation, the Kiosk will recommend the passenger to “Please see an airline representative to complete the boarding along with issues during the validation process”.

The simulated kiosk experience can be created as below:

- We have created a Flight Manifest List file which contains a list of 6 passengers with their info;
- The flight Manifest contains is used to cross-check with the data collected (ID Card and boarding pass) to certify if the passenger is allowed to onboard and if the information provided is correct;
- The passenger ID card is used to validate with a given photo (extracted from the 15-30 second video recorded) and has a threshold of 80% or above;
- We generated a project owner ID Card and boarding pass to validate the face recognition using a video from the project owner;
- The Kiosk collect passenger emotion as positive or negative and provides feedback;

- Passenger carry-on items are scanned to detect lighters and if a lighter is detected, the passenger is flagged due the prohibited item in the carry-on baggage.

Input Data Sources:

- Flight Manifest List for all passengers (6) stored in Azure Blob Storage;
- Passenger ID card (6 including one face photo for the project owner);
- Passenger Boarding Pass (6);
- Passenger 15-30 second video showing their face;
- Passenger carry-on items photo.

The Solution Strategy:

- We will use Azure Form Recognizer Service to extract information from ID cards and boarding passes. This service will use a model trained;
- The manifest list will be used to validate the passenger information extracted from the boarding pass;
- Upon success confirmation that the passenger's name exists in the manifest list then the passenger's identity will be validated using the ID card;
- Additionally, we will use Azure Computer Vision, Face API and Video Indexer to match passenger's face from ID card with face extracted from a 15-30 second video;
- We will use Azure custom vision services to create a model for the lighter identification in the passenger carry-on baggage;
- Once the boarding pass validation process is done, the Kiosk will show the message of either successful or unsuccessful validation. This will be the last step in the project.