

PROJECT 1: AUTOMATED PASSENGER BOARDING KIOSK

Problem:

Airports currently have a manual procedure to receive passengers, verify their documents, and process their documents so that they can board their flight. This procedure is tedious and takes time, considering the hundreds of thousands of passengers that come to an airport on any given day.

There is a need to process this passenger boarding information more efficiently and give passengers a better experience.

The following data will be considered in this project: a flight manifest, digital ids, boarding passes, and a video showing my face for the intended purpose of confirming my identity.

Solution:

To solve these problems, I propose a boarding kiosk that receives information from a passenger, verifies their information, scans their luggage for lighters, and validates that they are permitted to take a flight. The kiosk can retrieve stored information about flight details, people, and video streams.

My strategy is to create a seamless process with the following steps below:

- Receiving an image of my personal identification
- Receiving a video stream of myself on an automated kiosk
- Receiving my boarding pass
- Comparing the image of my personal identification with the face in the received video stream, in order to determine whether both data items match
- In response to determining the match, validating my identity
- Extracting information based on my boarding pass
- Using an external service, determining if a lighter exists in my carry-on item
- If a lighter exists in my carry-on item, detecting the lighter in my carry-on item and providing validation information

Here will the corresponding services for each step:

- Receiving an image of my personal identification (Computer Vision, Form Recognizer, Face Service)
- Receiving a video stream of myself on an automated kiosk (Video Indexer and Face-Identify API)
- Receiving my boarding pass (Form Recognizer)
- Comparing the image of my personal identification with the face in the received video stream, in order to determine whether both data items match (Face-Verify API)
- In response to determining the match, validating my identity (Computer Vision)
- Extracting information based on my boarding pass (Custom Form Recognizer)

- Using an external service, determining if a lighter exists in my carry-on item (Custom Vision)
- If a lighter exists in my carry-on item, detecting the lighter in my carry-on item and providing validation information (Custom Vision)

To validate data from my learning models, I will use python SDK to confirm two pieces of information: 1) a valid passenger and 2) a valid carry-on

Here are correspondences between the data items and each cognitive service:

Personal identifications will be provided as	PDF documents for Form Recognizer, PNG Images for Computer Vision, and PNG Images for Face API and Face Service
Video stream will provides as an	MP4 video for Video Indexer
Faces extracted may be used for	**Face Services**
Boarding passes will be provided as	PDF documents for Custom Form Recognizer
Lighter images will provided as	JPEG Images for Custom Vision

Here are the model performance metrics and threshold I will use when performing data validation.

- Precision, Recall, and AP
- Probability Threshold