

Problem Definition and System Design

Problem

Udacity Airlines is a popular airline that operates in numerous countries worldwide. Due to its popularity and exceptional service, it enjoys the patronage of a lot of customers. Recently, the airline saw a 20% increase in its customer base due to some discount offers it had available.

Unfortunately, Udacity Airlines does not have the staff strength to cope with the increased patronage and requires automated solutions to assist with pre-flight boarding procedures.

Objective

Our objective is to build a solution that automatically validates passengers for an upcoming flight at an unmanned kiosk. This solution will eliminate the need for Udacity Airlines to hire staff for these validation checks and will rely on AI and Machine Learning to work.

We are developing this solution that leverages automation to save hiring costs for Udacity Airlines while improving the pre-flight experience for passengers who use the airline to get to their various destinations.

Solution Strategy

We imagine the automated pre-flight validation flow to resemble the following:

- The passenger walks up to the kiosk with their boarding pass and identity document
- The passenger scans their boarding pass and ID at the kiosk and sees a message that tells them whether or not they have been validated, and if they should see a customer service representative
- The passenger's luggage scans their luggage to check for prohibited items (i.e lighters)

To build this solution, we will require input data from different sources. When a passenger arrives at an automated kiosk, we will need to capture a short video of their face and scan their boarding pass and ID documents. This will give us information about the passenger's face that we can match with the image on the photographic ID. We will also extract text from the passenger's boarding pass and ID to ensure that their details are correct and match our records in the flight manifest. Finally, we need object detection technology to find prohibited items in passengers' luggage.

To support the implementation of this solution, we need the following services from Azure:

- Azure Face Services for face recognition and face detection
- Azure Video Analyzer/Indexer for video analysis
- Azure storage to save flight information, model training data etc
- Azure Custom Vision for detection of prohibited items
- Azure Form Recognizer to extract textual data from boarding passes and identity documents