Automated Passenger Boarding Kiosk
Problem Description

Project Objective:

This project aims to create a computer vision and AI-powered passenger boarding kiosk for airport operations. The automated tool is designed to facilitate airline passengers in boarding planes independently, without the need for human assistance. It covers several aspects of the boarding process, mainly focusing on the identification of

Functionalities:

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

- Airline passengers should be able to scan their ID card and Boarding pass at the kiosk
- The kiosk should be able to extract passenger information from the boarding pass and then verify it from the ID card.
- The kiosk should be able to take a 10-second video of the person and perform facial recognition to match the live person at the kiosk with the ID card provided during the scan.
- The kiosk should also be able to scan the passenger's carry-on baggage, identify any prohibited item, and stop the passenger from boarding.
- If all scanning and validation go well, the kiosk greets the passenger with a final message that “He/she can board the plane” or if there are issues, the kiosk can suggest to 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:

- Create a passenger manifest that contains at least 6 passengers with their personal data
- Collect data from the boarding passes using the Custom Form recognizer
- Collect data from ID cards using the ID Recognizer
- Collect data from video recording using Video Analyzer
- Cross-check data from boarding passes and ID cards with the flight manifest
- Validate ID photo and video
- Display Information about flight origin and destination on the kiosk screen
- Check luggage for lighters

Input Data Sources:

- Flight Manifest List for all passengers
- Passenger ID cards
- Passenger Boarding Passes
- Passenger 15-30 second video showing their face
- Passenger carry-on items photos

Additional:

- 10 Boarding Passes for custom model training

The Solution Strategy:

- The Azure Form recognizer is used to label boarding passes and train a custom model to extract passenger data.
- The Azure Form Recognizer for Digital IDs is used to extract the photo and personal information from the digital IDs of the passengers.
- The information from the boarding pass is validated using the manifest.
- If the person was validated successfully in the manifest, the identity will be validated using the personal ID.
- Azure Video Indexer is used to validate the photo from the ID card with the passenger video
- A custom model is trained with a set of lighter images using the Azure custom vision service
- Baggage images are checked for lighters using the custom model
- After all validation steps are done, a message is displayed on the Boarding Kiosk