Automated Passenger Boarding Kiosk

Description:

In this project, we are going to build an automated passenger boarding kiosk using Azure cognitive services that will assist some of the pre-flights boarding procedures. Variety of different computer vision processes such as authentication and text extraction will be done in this kiosk with the help of azure cognitive services.

Objectives:

- Identity validation using video from kiosk, id card and boarding pass information
- Flight validation using boarding pass
- Boarding kiosk experience using a video from kiosk
- Lighter detection in carry-on baggage using lighter images

Dataset:

- 30 seconds video from kiosk:
    - Face picture – [for identity verification]
    - Sentiment – [for Boarding kiosk experience]
    - Emotion – [for Boarding kiosk experience]

- Boarding pass:
    - First Name – [for identity verification]
    - Last Name – [for identity verification]
    - Seat – [for flight validation]
    - Date – [for flight validation]
    - Flight No – [for flight validation]
    - Origin – [for flight validation]
    - Destination – [for flight validation]

- Driving Licence ID card:
    - First Name – [for identity verification]
    - Last Name – [for identity verification]
    - Date of Birth – [for identity verification]
    - Face picture – [for identity verification]
    - Sex – [for identity verification]

- Lighter Images:
    - Public lighter images – [Lighter detection in carry-on baggage]
    - Test carry-on images – [Lighter detection in carry-on baggage]

Solution:

I. Text Data Extraction -> Form Recognizer -> Boarding pass , Digital ID : Extract text within these two input data
II. Face Data Extraction -> Face API -> Digital ID , Video from kiosk : Extract human face within these two input data for authentication purposes
III. Object Detection -> Custom Vision -> Lighter images : Build a model to detect lighter in carry-on baggage

Model metrics and evaluation:

- For model evaluation: different metrics such as recall, and precision will be calculated for models .

- For DOB validation: extracted document from digital ID & boarding pass

- For Person validation: picture extracted from 30 seconds video & digital ID

- For Name validation : extracted information form digital ID & boarding pass

- For carry on baggage validation : extracted picture from carry on baggage

Data Flow Diagram

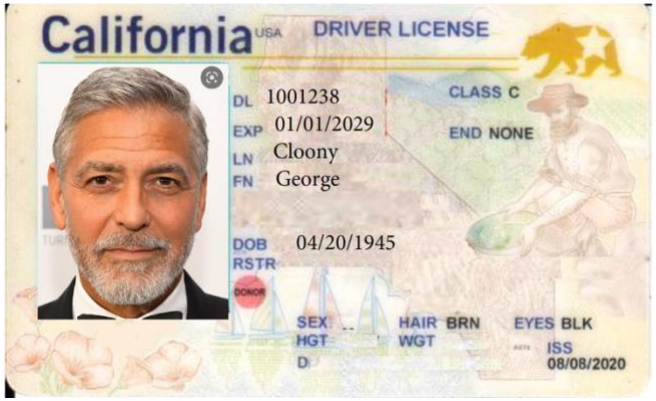
Driving License

First Name
Last Name
Date of Birth
Face Picture
Sex

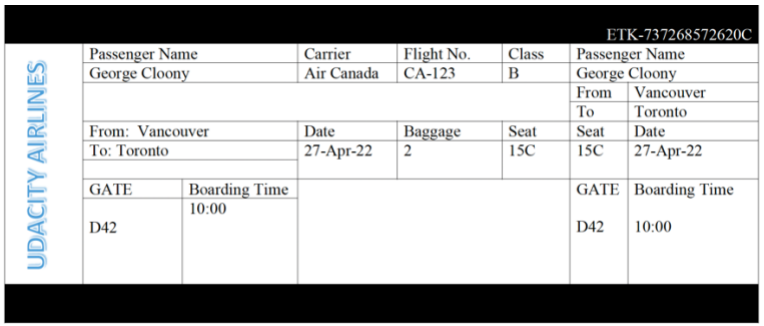
Identity Verification

First Name
Last Name
Seat
Date
Flight No
Origin
Des

Boarding Pass



Flight Verification



ETK-737268572620C

UDACITY AIRLINES

Passenger Name		Carrier	Flight No.	Class	Passenger Name	
George Cloony		Air Canada	CA-123	B	George Cloony	
					From	Vancouver
					To	Toronto
From: Vancouver		Date	Baggage	Seat	Seat	Date
To: Toronto		27-Apr-22	2	15C	15C	27-Apr-22
GATE	Boarding Time				GATE	Boarding Time
D42	10:00				D42	10:00

30 Seconds video from kiosk

Face Picture
Sentiment
Emotion

Boarding Kiosk Experience

Carry-on baggage Verification

Public lighter images
Carry-on Item images

Lighter Images

Architecture Diagram