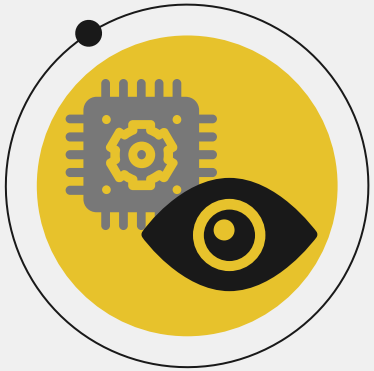
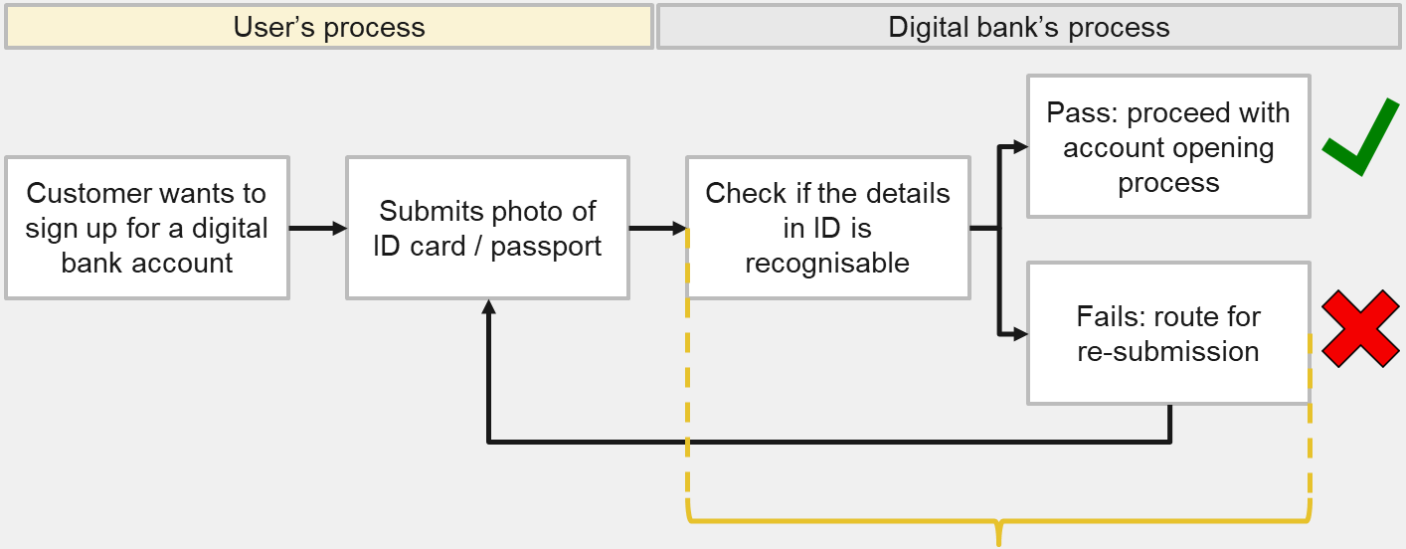


Validating ID Submissions using Computer Vision

Improving the customer experience in applying for a new digital bank account

Problem Statement

A digital bank in Singapore wants to **shorten its account opening process** by automating its customer identification (ID) validation process. Currently:

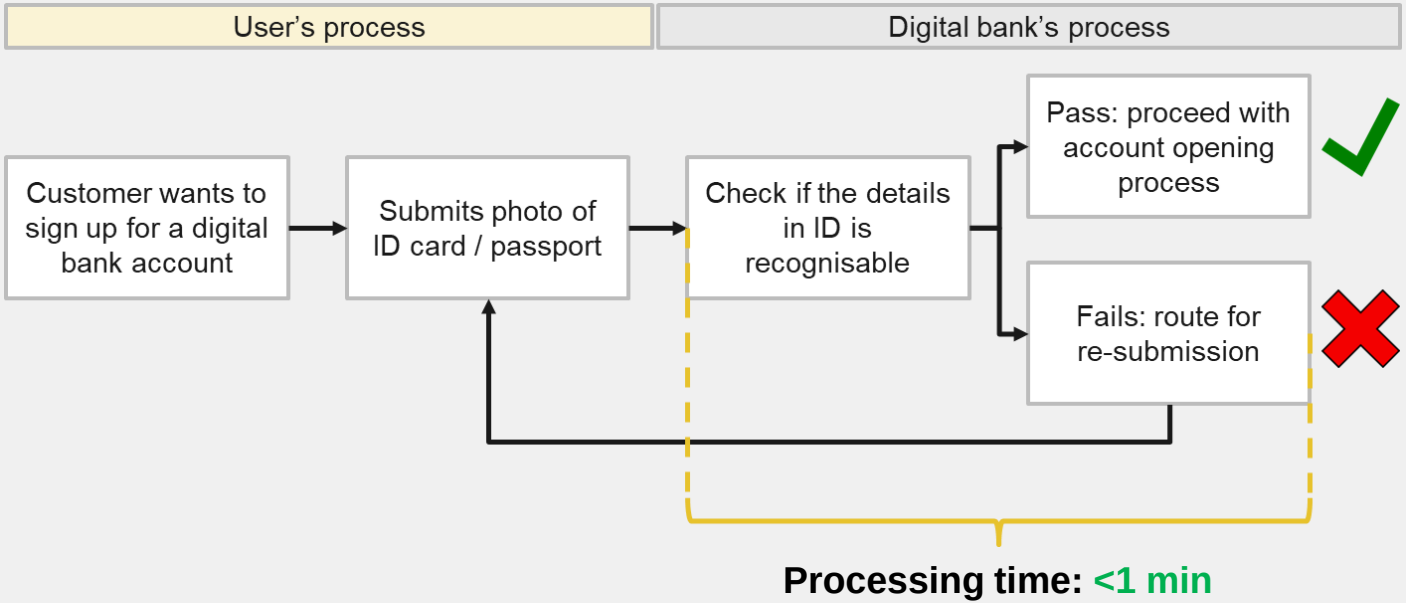


Processing time: 3 – 5 working days*

*For reference: an incorrect photo submission to Singapore's ICA may double the process time (The Straits Times, May 22): 2 weeks for NRIC, 4 weeks for passport (ICA, n.d.)

Goal

Using computer vision, automatically and quickly evaluate the submitted photo with the digital bank's photo guidelines:

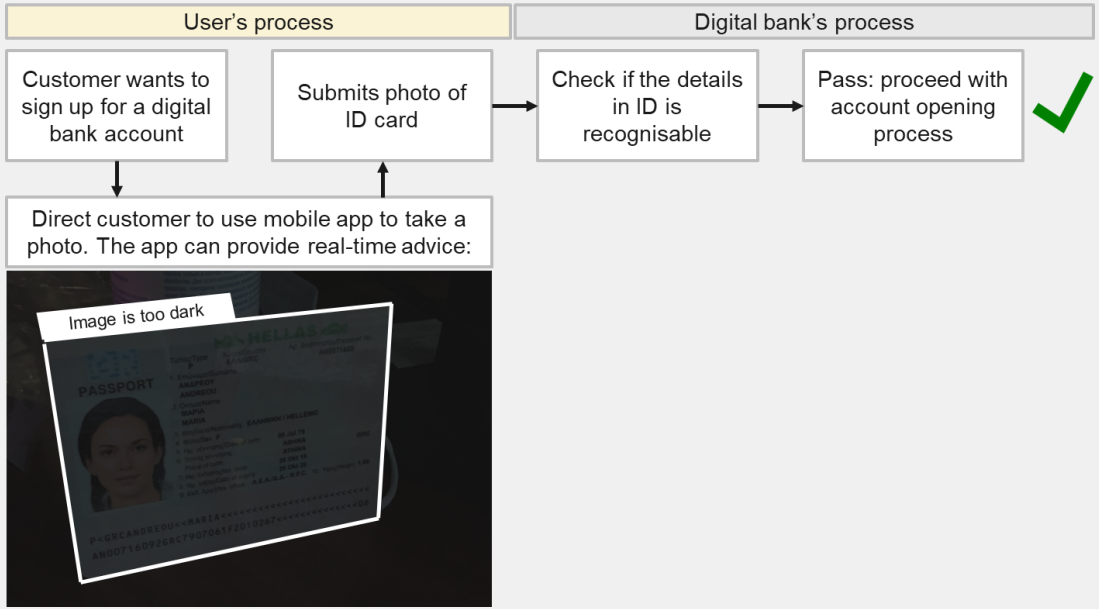


Processing time: <1 min

Challenge: binary object detection in images

Stretch Goal

Using computer vision, automatically and quickly evaluate the submitted photo with the digital bank's photo guidelines:



Challenge: multiclass object detection in videos

Dataset – Acceptable Photos*

Normal

Different background

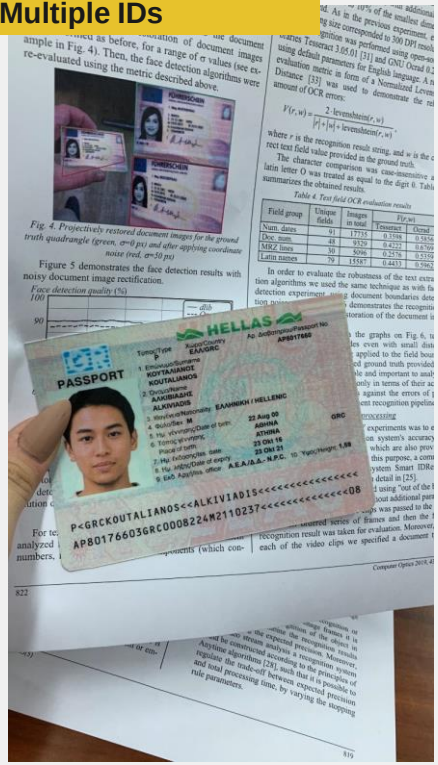
Different brightness

*Already have: 1,000 samples that are annotated

Dataset – Acceptable Photos

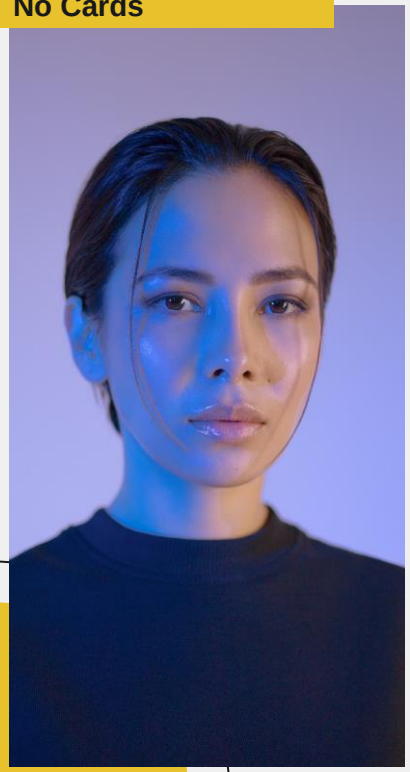
Multiple cards

Multiple IDs



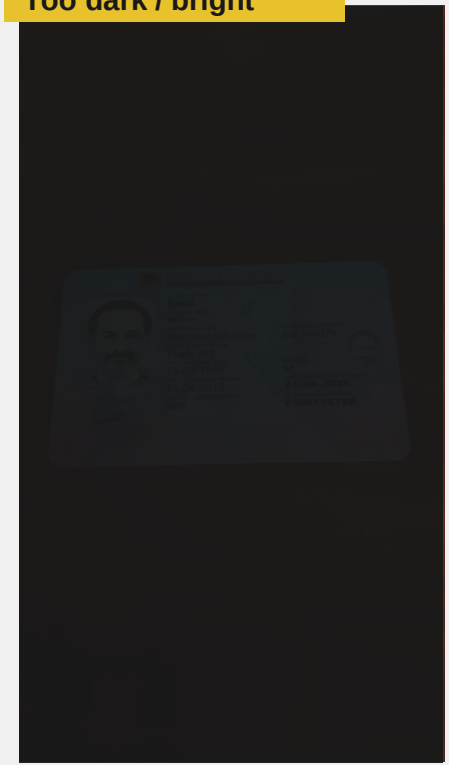
Dataset – Unacceptable Photos*

No Cards

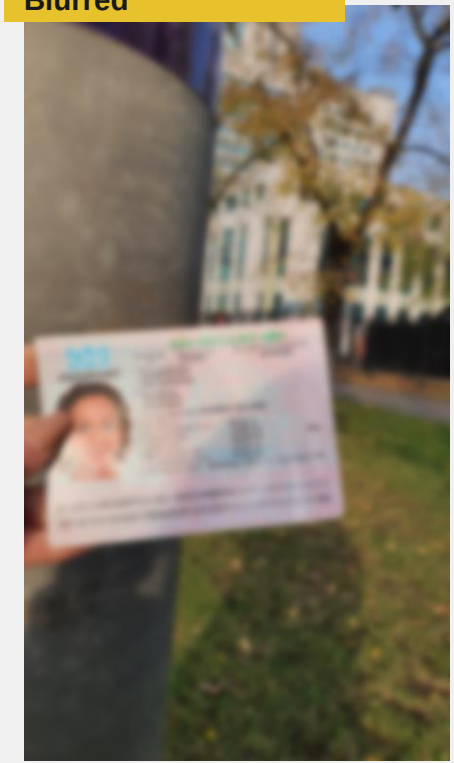


Non-ID Cards

Too dark / bright



Blurred

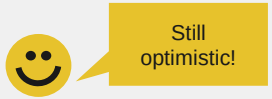


*Need to generate: 1,000 for this ‘unacceptable’ class

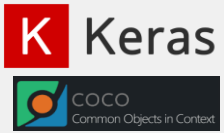
Project Workflow

1. Create capstone environment

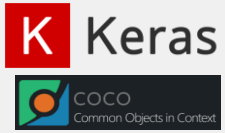
2. Label ‘unacceptable’ images



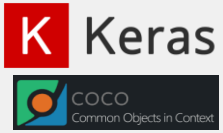
3. Instantiate & save YOLOv3 model



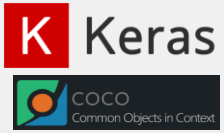
4. Train custom model



5. Predict & analyse results



6. Stretch goal! Detect ID cards in videos



7. Stretch goal! Deploy on streamlit

Thanks!

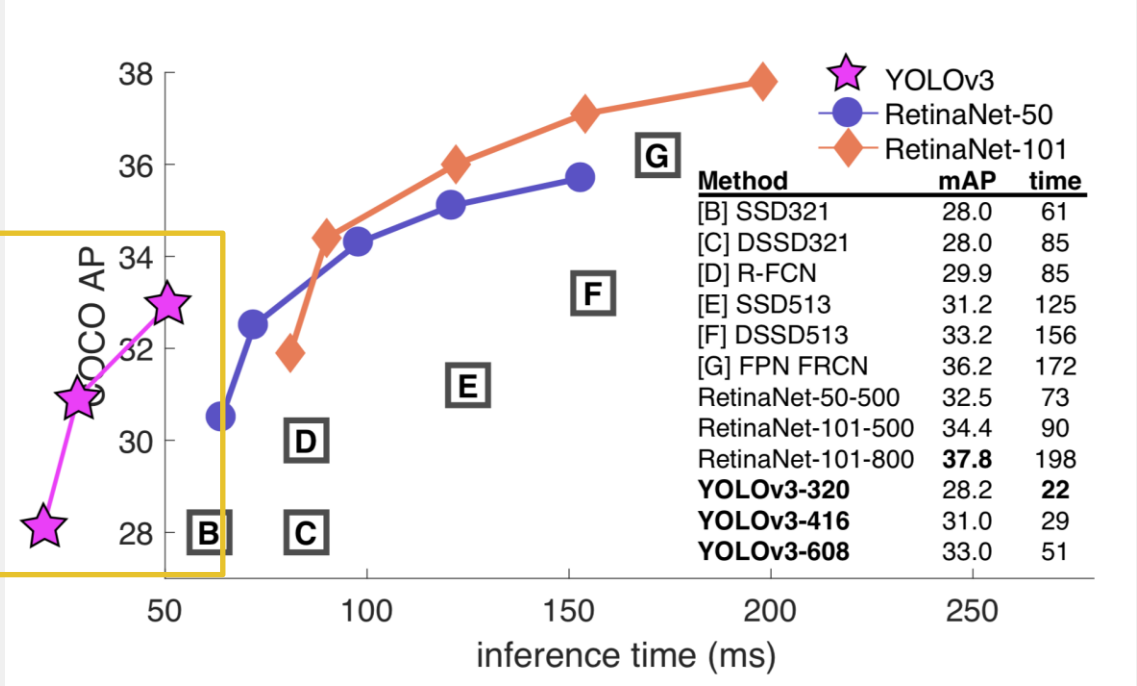
Do you have any questions?

Resources:

Theory	History of computer vision	Lil'log
	Understanding MAP metric	Medium
	Understanding labelling	SuperAnnotate
	Understanding YOLOv3	Paper
Computer vision workflow	Labelling with labelImg	Labelmg github Roboflow
	Getting started with VS Code	VS Code
	How to use YOLOv3 with Keras	Machine learning mastery
	How to train YOLOv3	Experiencor github Gilbert Tanner Kaggle
	COCO dataset	COCO
Stretch goals	Multi-label CV using Keras	Analytics Vidhya

Annex: Why YOLOv3 and Not Other Models?

YOLOv3 excels in detection speed, enabling object detection in real-time videos



Method	mAP	time
[B] SSD321	28.0	61
[C] DSSD321	28.0	85
[D] R-FCN	29.9	85
[E] SSD513	31.2	125
[F] DSSD513	33.2	156
[G] FPN FRCN	36.2	172
RetinaNet-50-500	32.5	73
RetinaNet-101-500	34.4	90
RetinaNet-101-800	**37.8**	198
YOLOv3-320	28.2	**22**
YOLOv3-416	31.0	29
YOLOv3-608	33.0	51