



Project 50 – Celebrity Video Face Recognition

Semester Project Presentation

DANG Ngoc-Vien
NGUYEN Thanh-Long

Outline

1. Task definition
2. Approach & Implementation
3. Experimental results
4. Conclusion

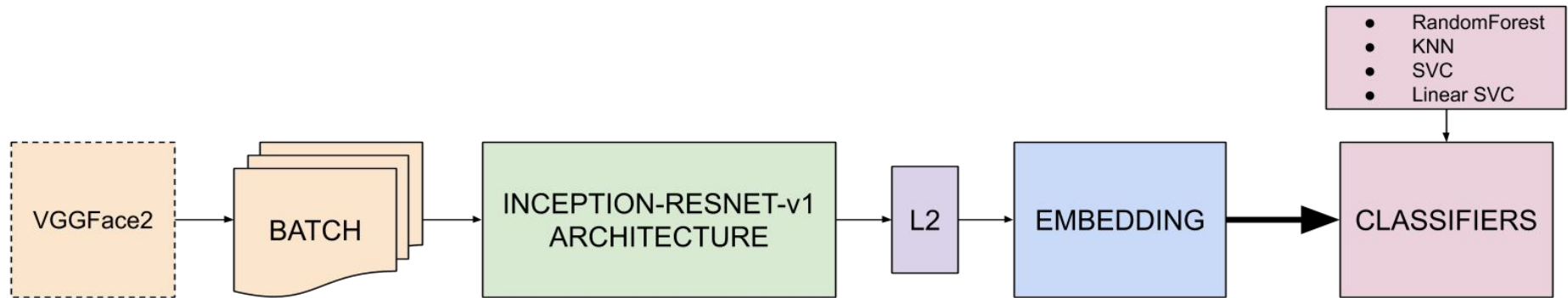
Task Definition

Task Definition

- The major purposes of the project:
 - Comparing the performance and the coverangece rate of the K-Nearest Neighbor (KNN), Support Vector Machine (SVM), and Random Forest classifier for the system, called FaceNet.
 - Implementation of a Face Recognition system with video as an input

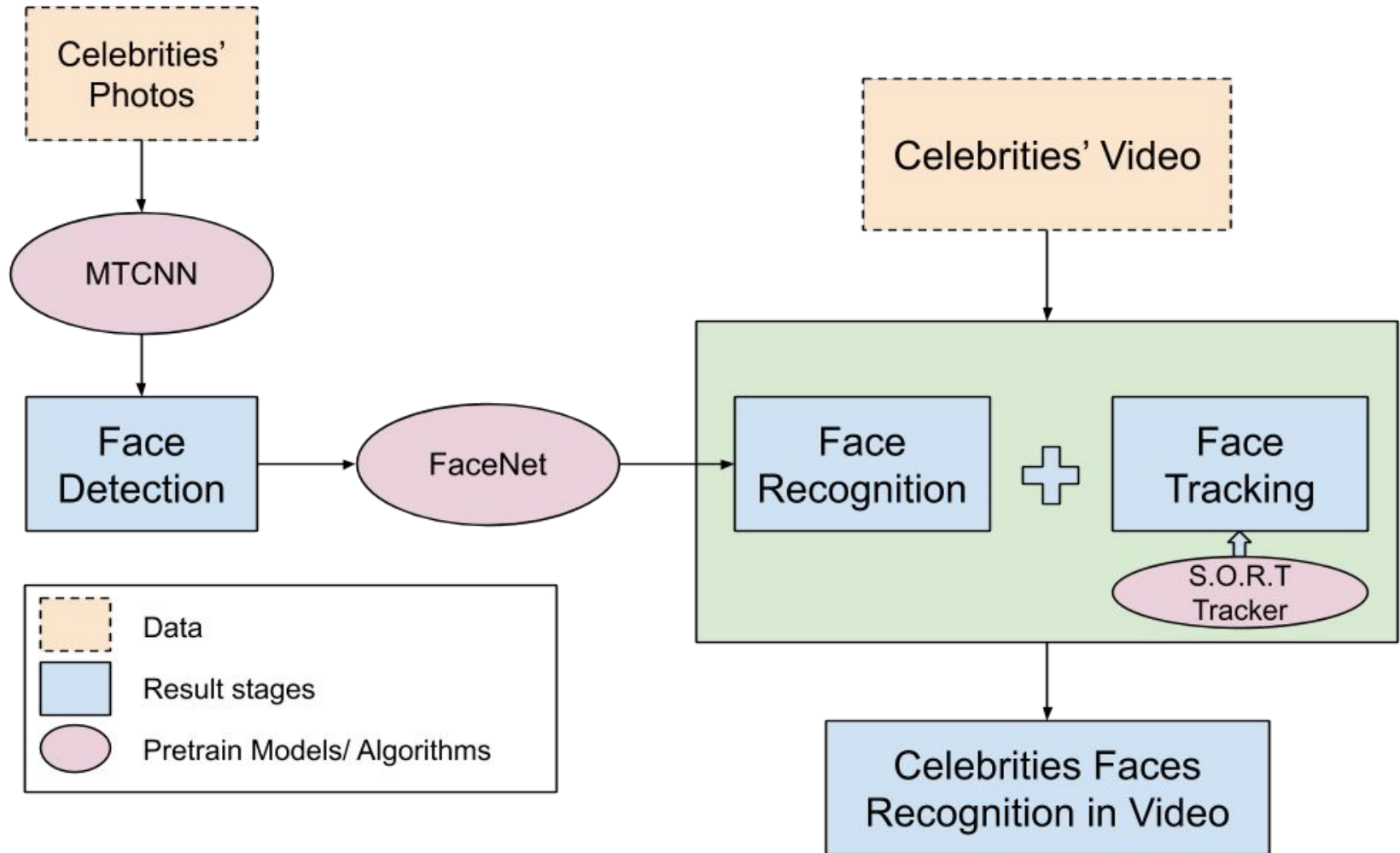
Approach & Implementation

The System - FaceNet



- Inception Net
- Resnet
- Inception-ResNet-v1
- The suggested pre-train FaceNet model: Inception-ResNet-v1 architecture trained with VGGFace2 data-set

Proposed Approach



Experimental results

Experimental results

- **Test Case 1:** Comparing the performance of the KNN, SVM, and Random Forest classifier when only one or few training samples are provided.
- **Test Case 2:** Comparing the convergence rate of the SVM and Random Forest classifiers when adding a new person into an existing embedding.
- **Test Case 3:** the performance of the system when combination FaceNet with tracker with video as input.

Test Case 1

Minimum No. image per class	No. training image per class	SVM	KNN	RF
40	35	0.999	1.000	0.998
5	1	0.000	0.920	0.344
10	1	0.000	0.952	0.771
20	1	0.000	0.982	0.927
5	2	0.282	0.972	0.440
10	2	0.348	0.980	0.820
20	2	0.351	0.991	0.974
5	3	0.942	0.977	0.543
10	3	0.908	0.985	0.857
20	3	0.990	0.993	0.986

Test Case 2

The result on the scenario with the existing embedding having 142 classes and 3425 images. Each class contains at least 5 images.

	SVC(kernel="linear")		
	Before	After but just 142-old persons	After with 143 persons
F-measure	0.9360960080196552	0.9360960080196552	0.9365428890824549
The training time (seconds)	23.190608739852905		

	RF		
	Before	After but just 142-old persons	After with 143 persons
F-measure	0.9631363941223097	0.9602554722273033	0.9605334059879514
The training time (seconds)	136.9974958896637		

Test Case 3



CONCLUSION

Conclusion

- The classification-time of KNN was fastest, followed by SVM and slowest was Random Forest.
- KNN worked really well even when only have a single image.
- The accuracy of SVM when only a few samples were provided is really low (even reached 0.000 % when only one provided).
- The accuracy of Random Forest even reached about 34.40% (in LFW dataset) with a single image and gradually increased when more samples are provided.
- Combination FaceNet with Tracker Approach works well in almost frames.

THANK FOR LISTENING