UNIVERSITI TEKNOLOGI MARA
Fakulti Sains Komputer Dan Matematik
EMINES School of Industrial Management
UNIVERSITÉ MOHAMMED VI POLYTECHNIQUE
ADVANCED ANALYTICS ENGINEERING Centre of Exellence

PRESENTATION

MONUMENTS RECOGNITION

AUGUST 2019

Supervisors:

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Dean of FSKM

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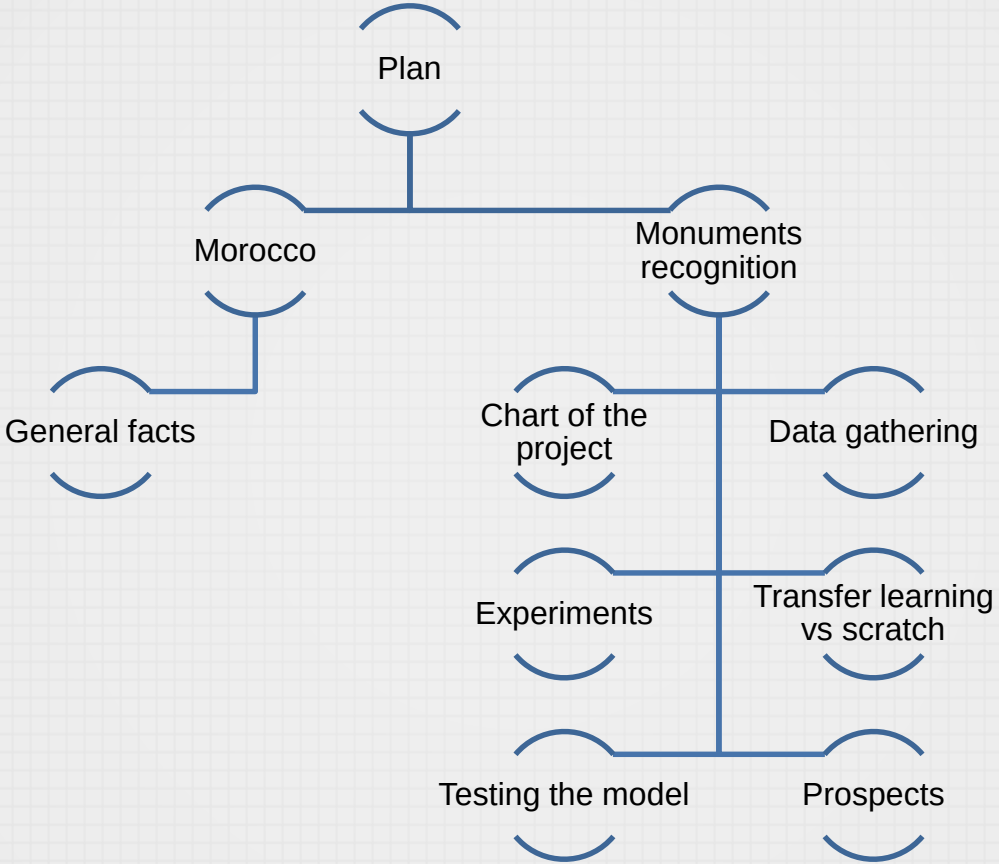
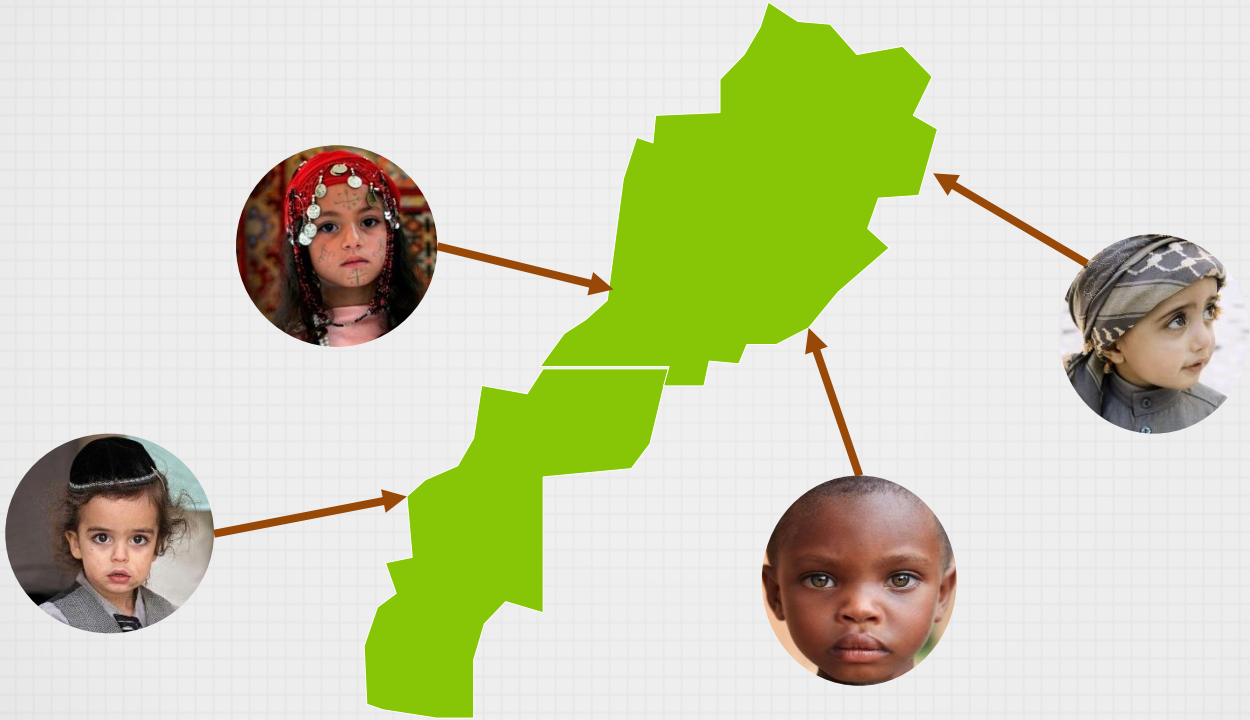
Head of AAEC. FSKM


Plan
Morocco
Monuments recognition
General facts
Chart of the project
Data gathering
Experiments
Transfer learning vs scratch
Testing the model
Prospects

Morocco: General Facts

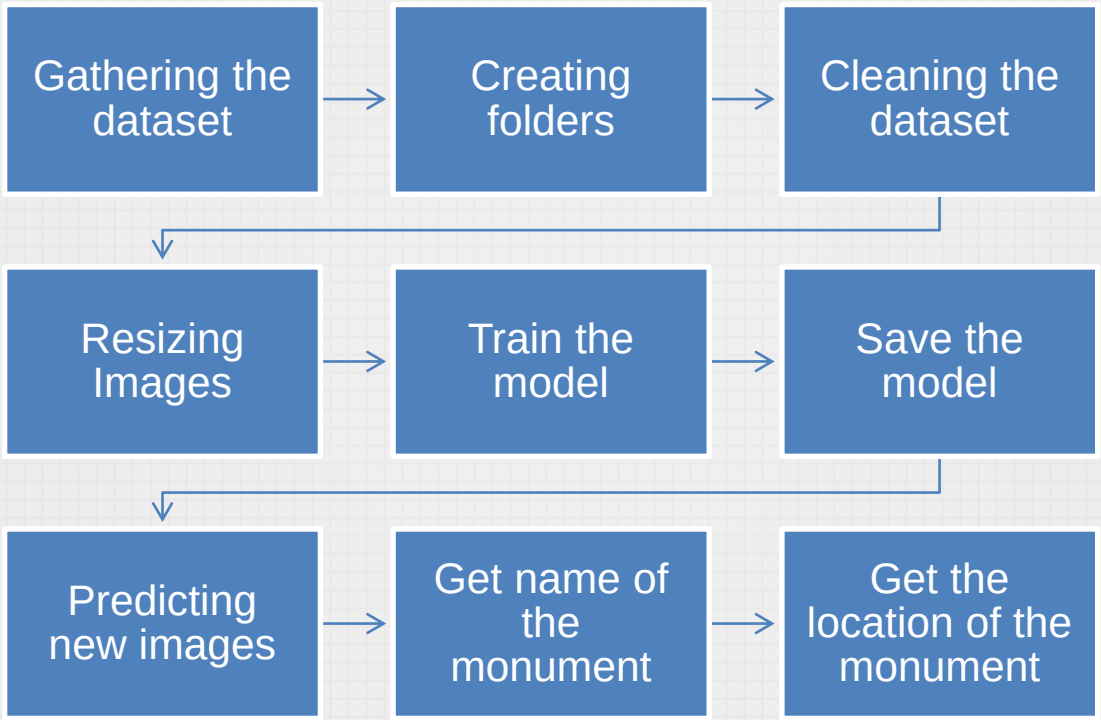
Morocco: General Facts

Morocco: General Facts



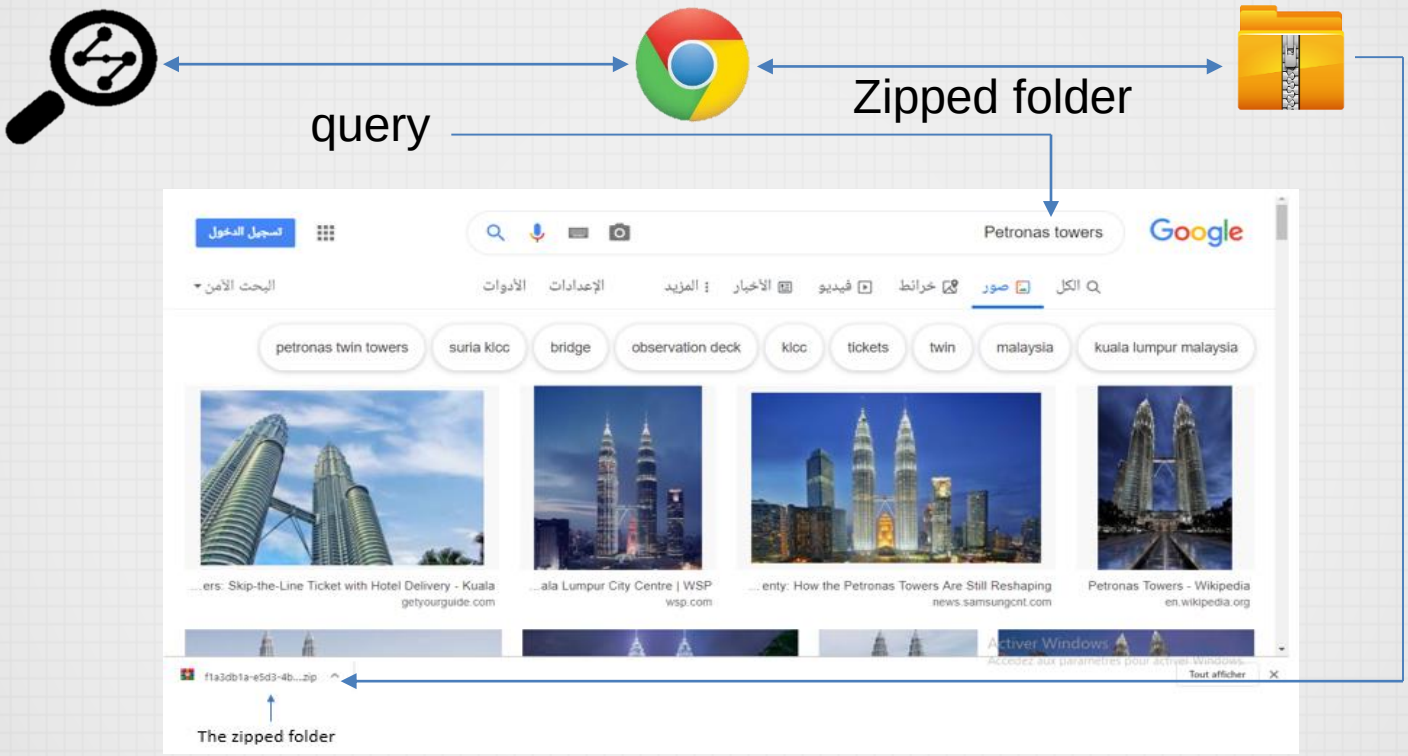
Monuments Recognition

Chart of the project



Data gathering

Data gathering:



Data gathering:

Eiffel Tower

France
451

Big Ben

England
359

Petronas Towers

Malayisa
537

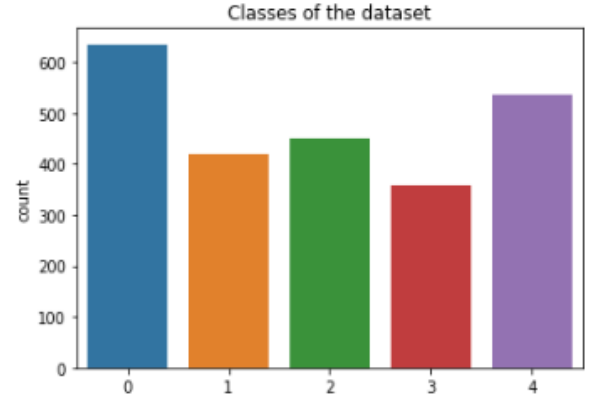
Statue Of Liberty

USA
635

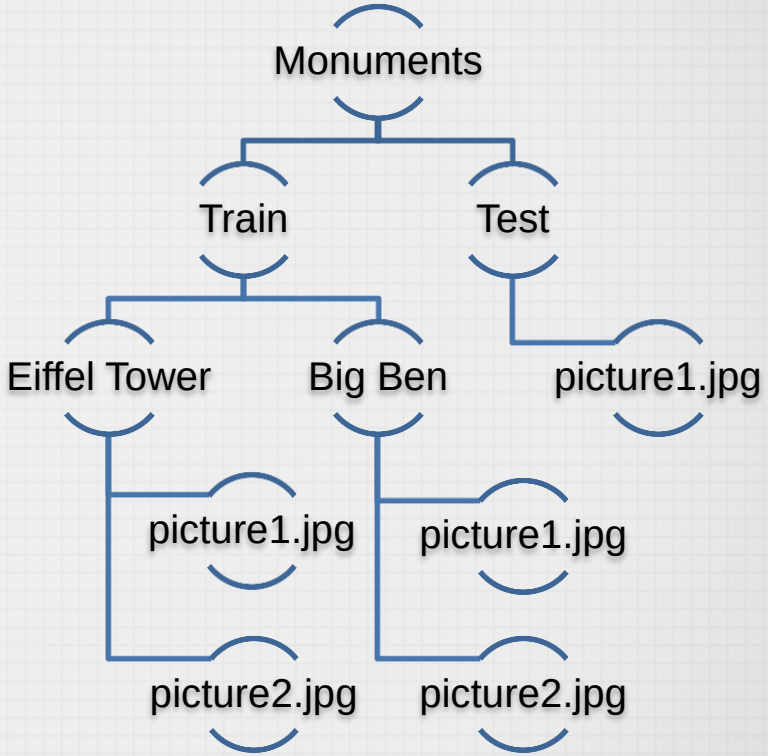
Taj Mahal

India
420

Data gathering:

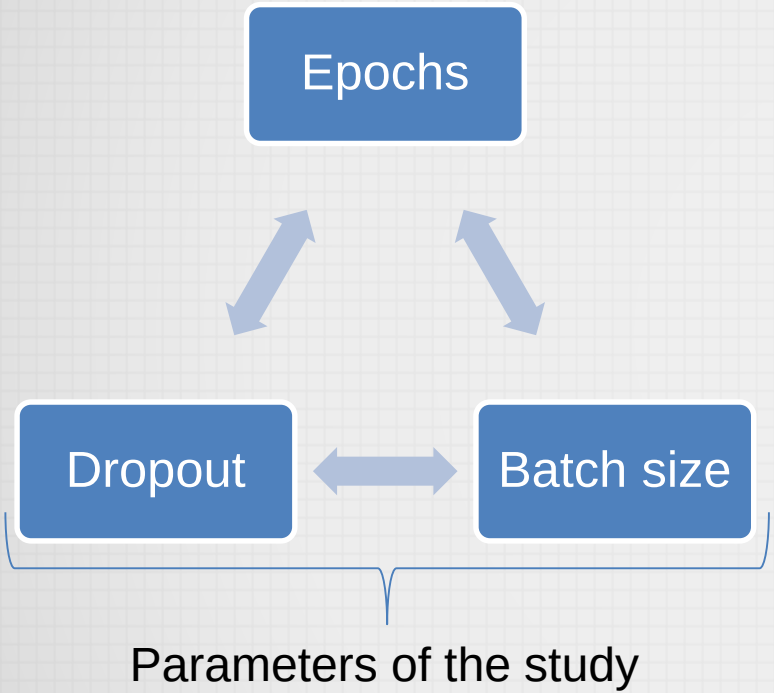


- Statue of Liberty
- Taj Mahal
- Eiffel Tower
- Big Ben
- Petronas Towers



Experiments

Experiments:



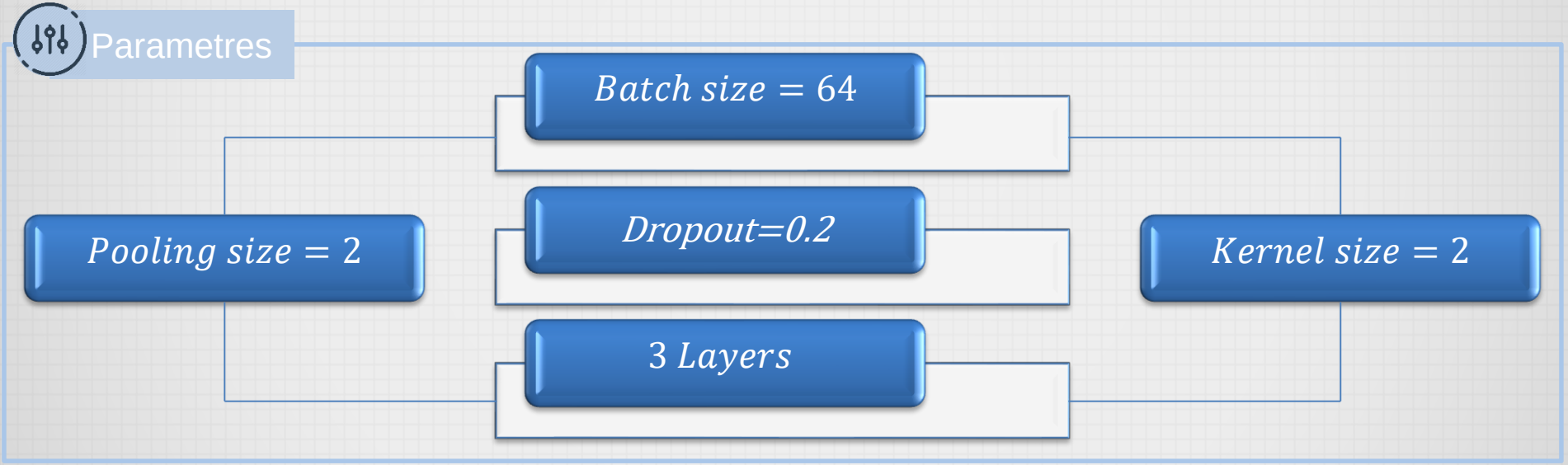
Procedure:

Run the program 10 times

Choose the best validation accuracy

Graph of the validation accuracies

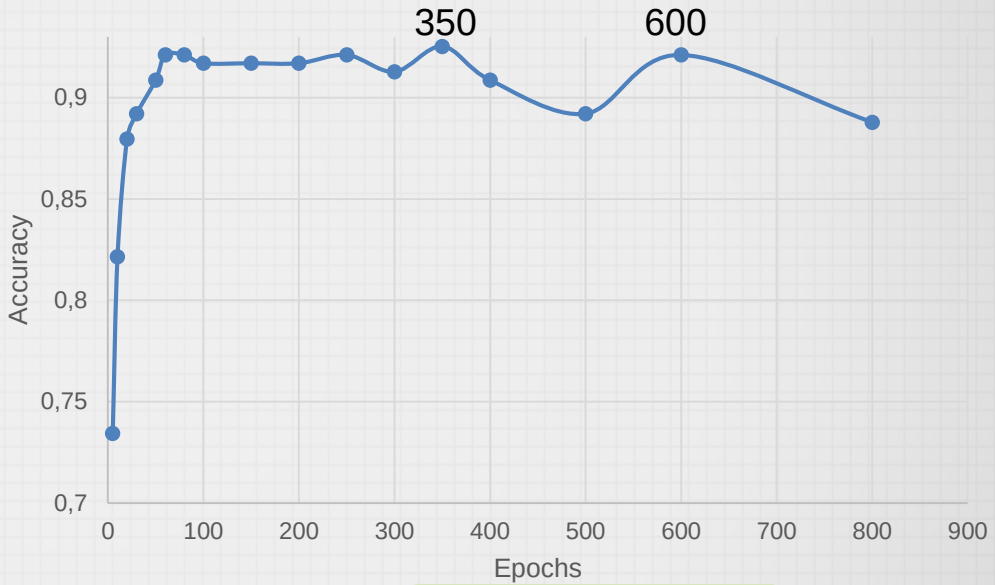
Experiments: Epochs



Experiments: Epochs

Results

Validation *Accuracy*	*Epochs*
0.7344	5
0.8215	10
0.8796	20
0.8921	30
0.9087	50
0.9211	60
0.9211	80
0.917	100
0.917	150
0.917	200
0.9211	250
0.9128	300
0.9253	350
0.9087	400
0.8921	500
0.9211	600
0.8879	800



$Epochs = 350$

Experiments: Dropout

Hypothesis

Dropout ↗ ⟷ $\Delta(train - test)_{accuracy}$ ↘

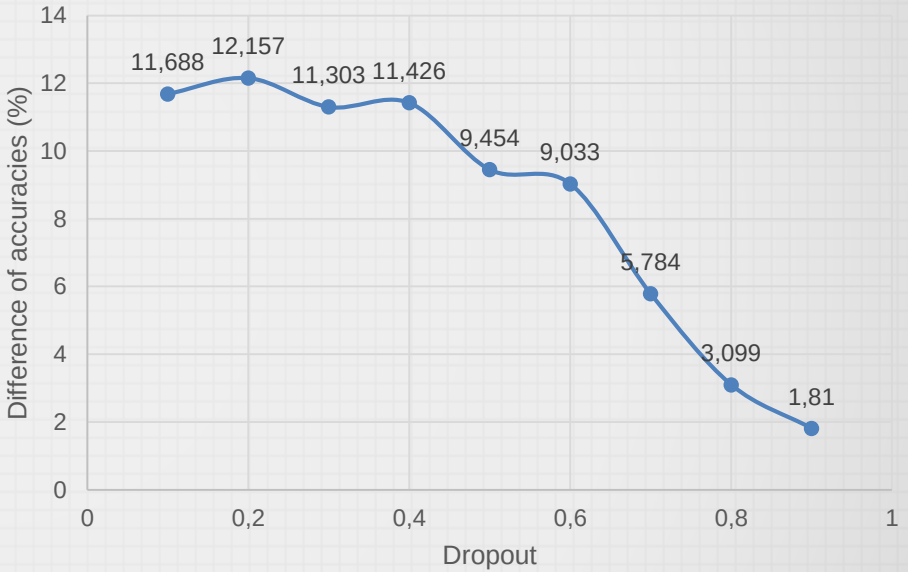
Parametres

- $Epochs = 100$
- $Batch\ size=64$
- $3\ Layers$
- $Pooling\ size = 2$
- $Kernel\ size = 2$

Experiments: Dropout

Results

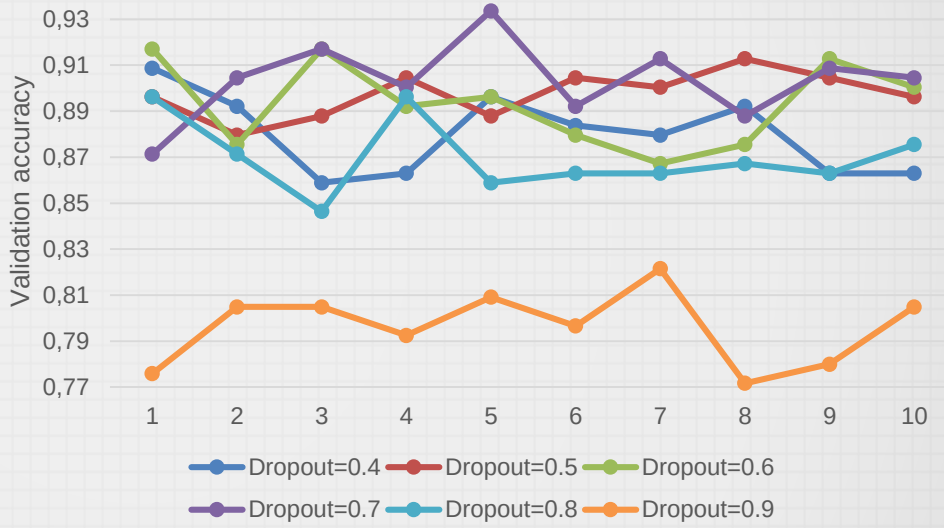
Dropout	Difference between accuracies
0.1	11.68
0.2	12.16
0.3	11.3
0.4	11.42
0.5	9.45
0.6	9.03
0.7	5.78
0.8	3.1
0.9	1.81



Experiments: Dropout

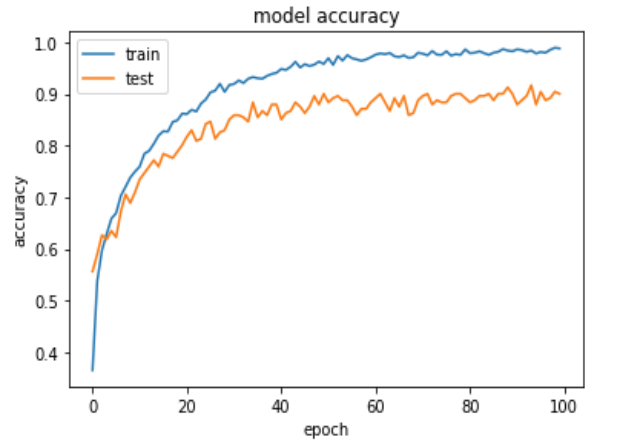
Results

Dropout	Mvalidation accuracy
0.4	0.9087
0.5	0.9128
0.6	0.917
0.7	0.9336
0.8	0.8755
0.9	0.8215

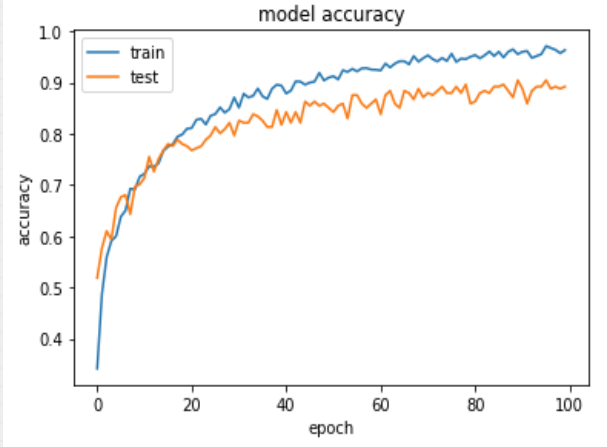


Experiments: Dropout

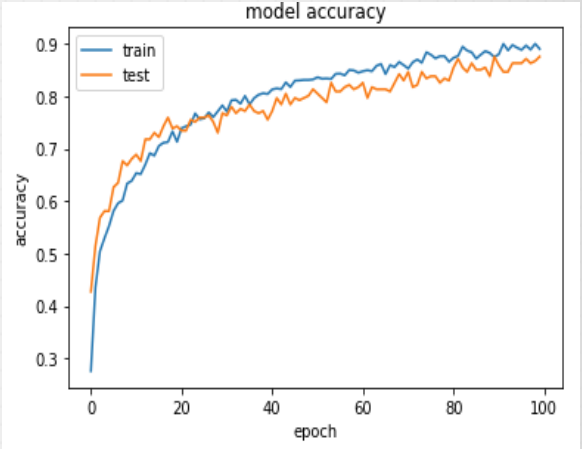
Results



$Dropout = 0.6$



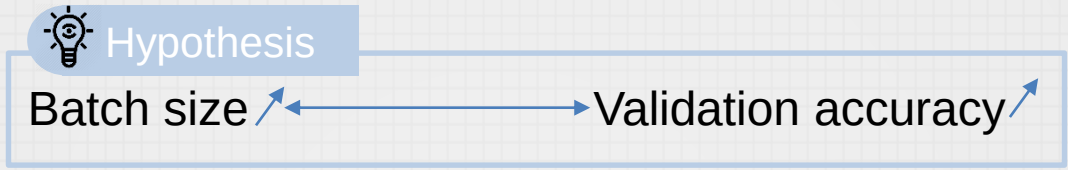
$Dropout = 0.7$

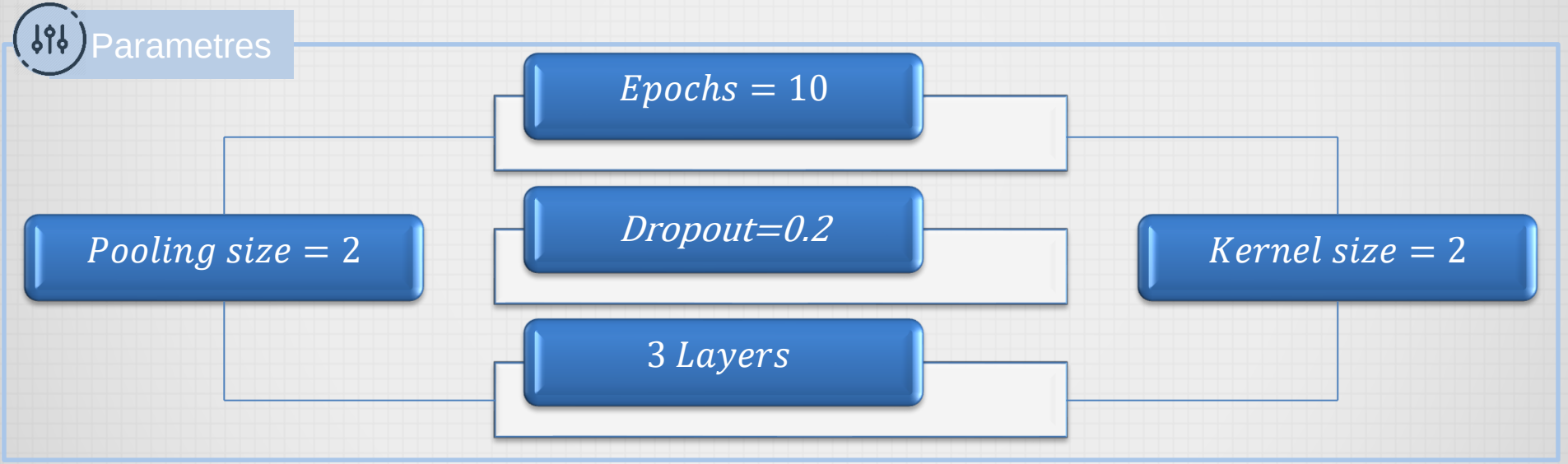


$Dropout = 0.8$

$$\Delta(train - validation)_{accuracy} \searrow + \; validation_{accuracy} \nearrow \xrightarrow{Dropout} 0.7$$

Experiments: Batch size

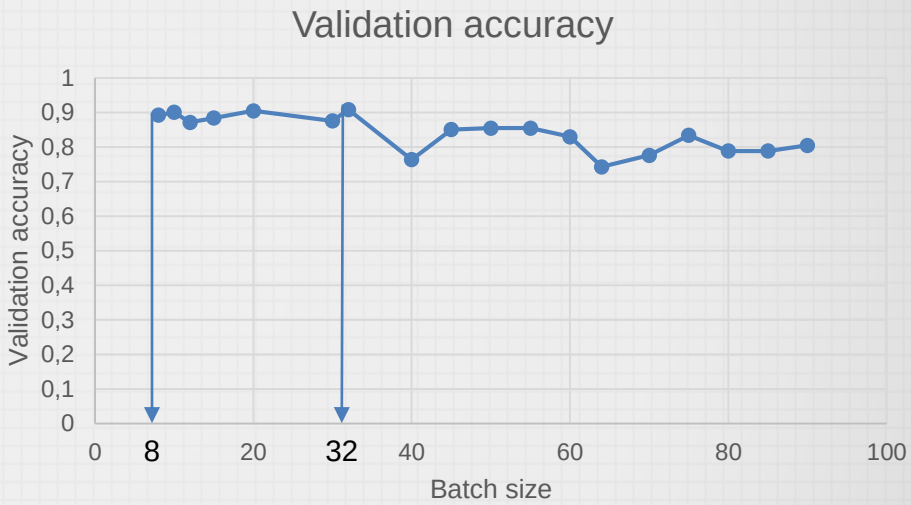




Experiments: Batch size

Results

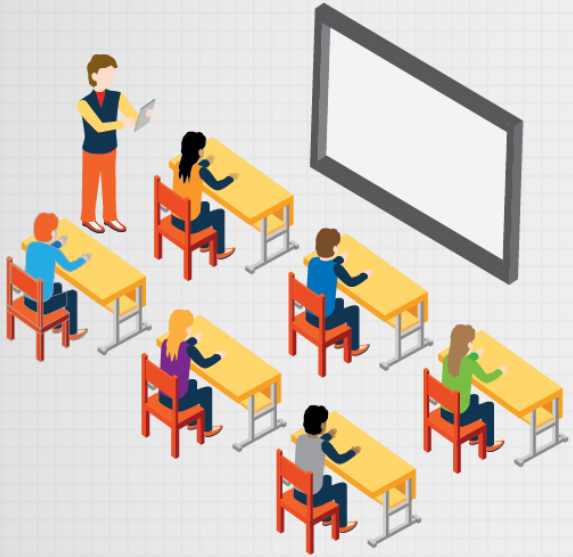
Batch Size	Validation accuracy
8	0.892116183
10	0.900414931
12	0.871369296
15	0.883817434
20	0.904564307
30	0.875518665
32	0.908713693
40	0.763485475
45	0.850622415
50	0.854771779
55	0.854771793
60	0.829875503
64	0.742738585
70	0.77593361
75	0.834024902
80	0.788381727
85	0.788381727
90	0.804979244



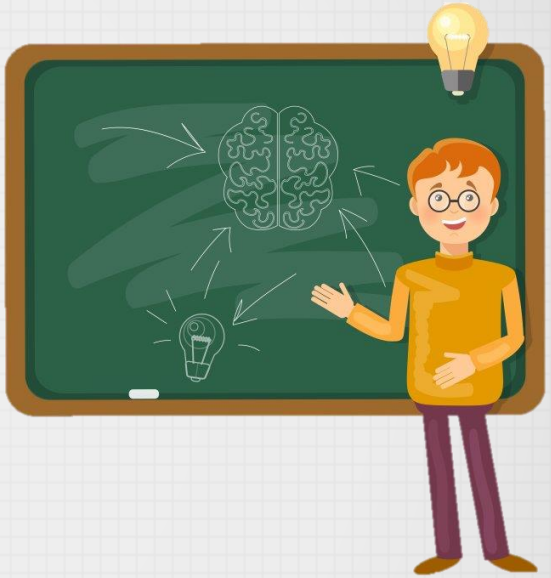
$Batch\ size = 32$

Transfer learning vs scratch models

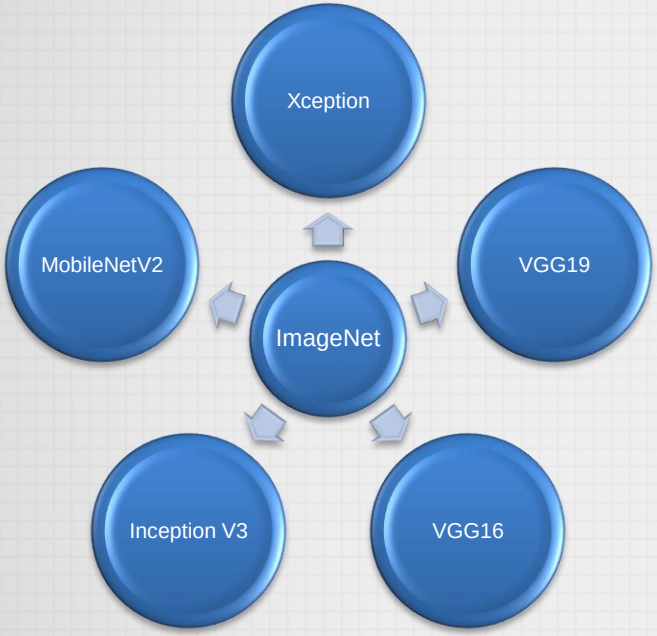
Transfer learning:



Transfer learning



Transfer learning:



From scratch

- 3 layers

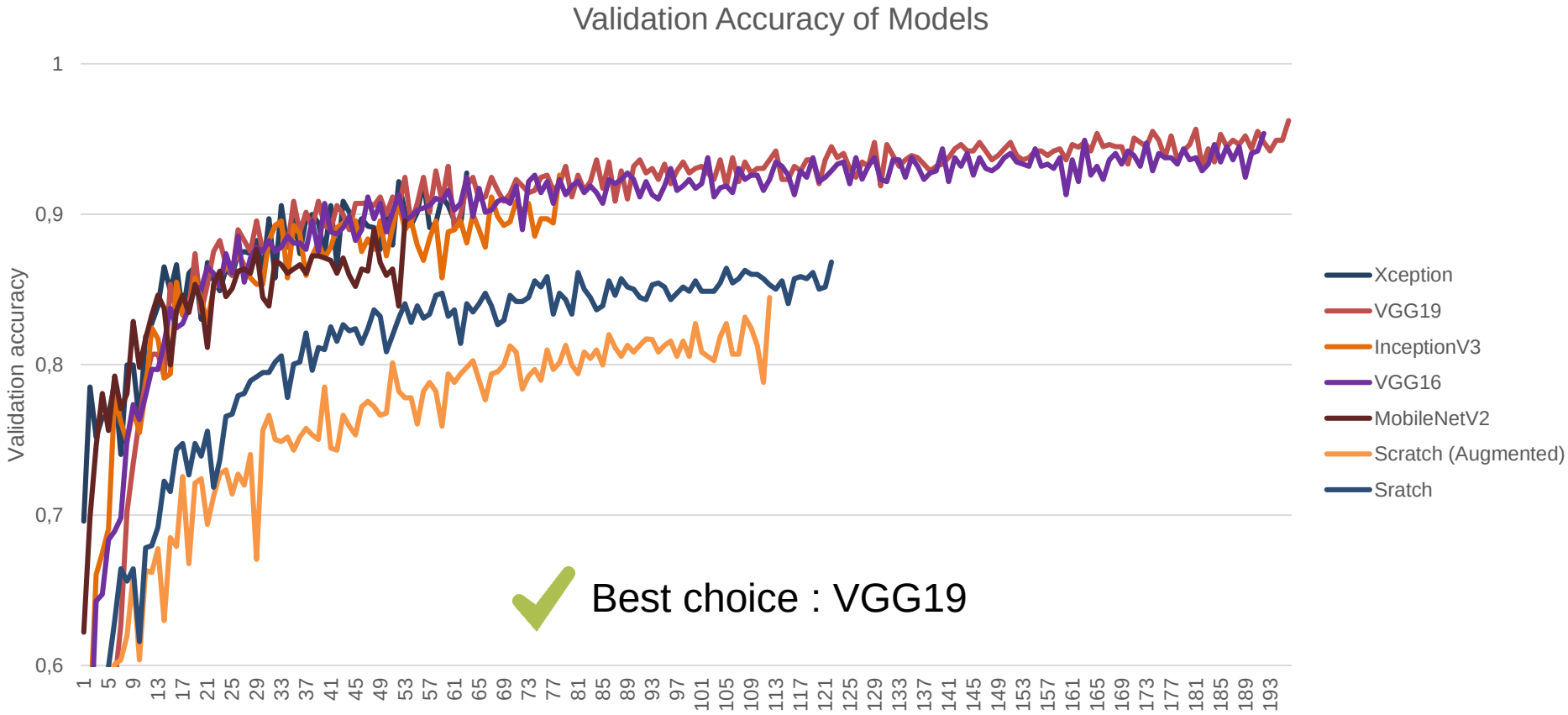
From scratch

- 3 layers (augmented)

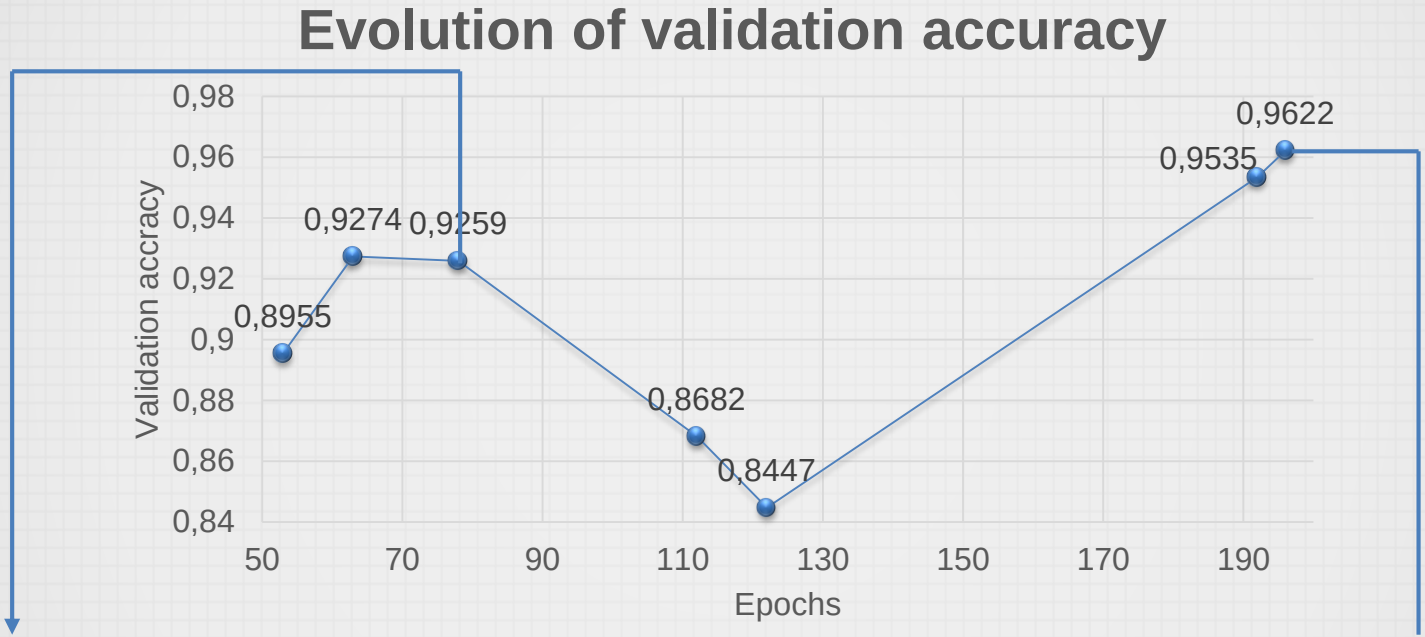
Transfer learning:

Model	Epochs	Mvalidation accuracy
Xception	63	0.9274
VGG19	196	0.9622
VGG16	192	0.9535
InceptionV3	78	0.9259
MobileNetV2	53	0.89550
From scratch	112	0.8682
From scratch (augmented)	122	0.8447

Transfer learning:



Transfer learning:



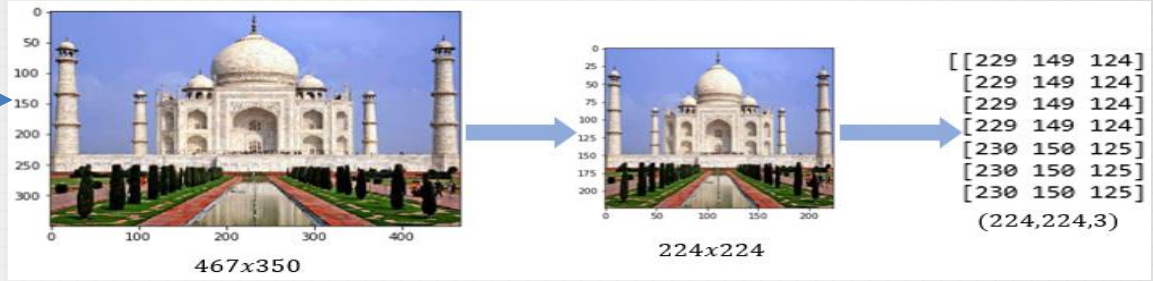
- Good Accuracy
- Less time consuming

- High Accuracy
- More time consuming

TESTING THE MODEL

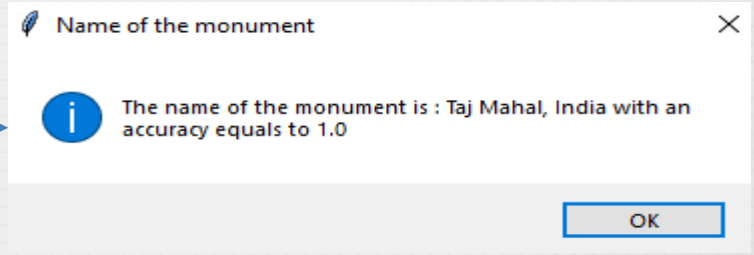
Testing the model:

- Processing the images

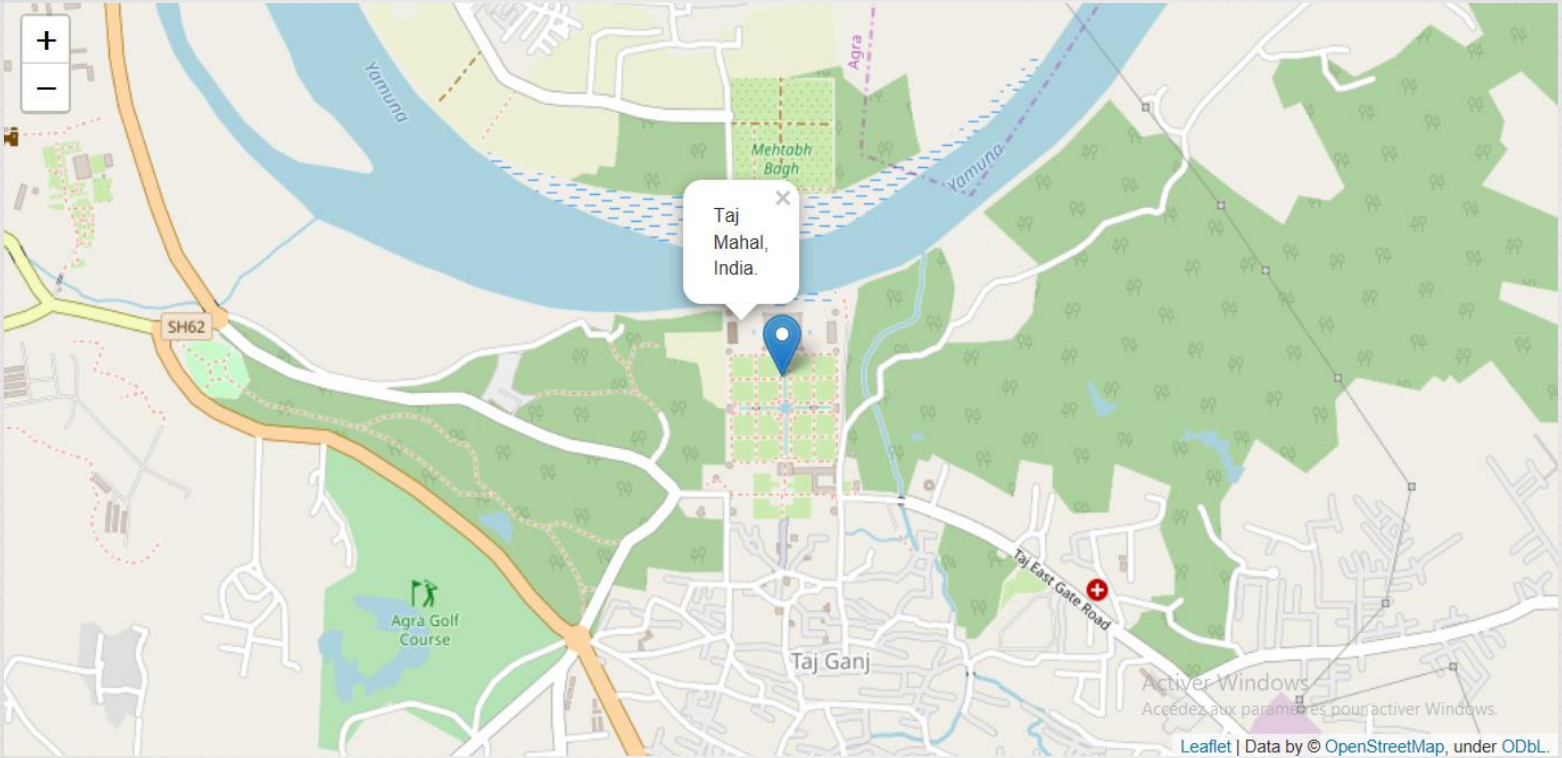


- Prediction

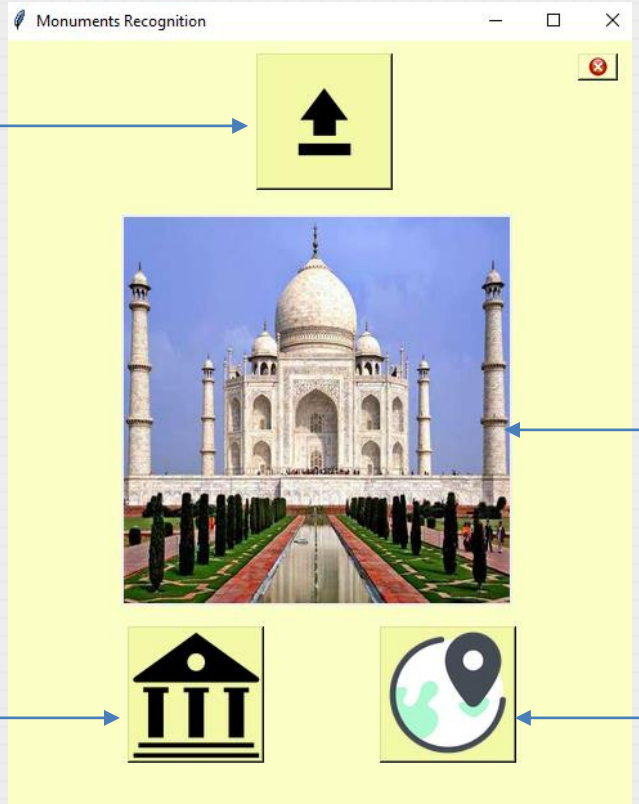
- Name of the monument



Testing the model:



Testing the model: Interface



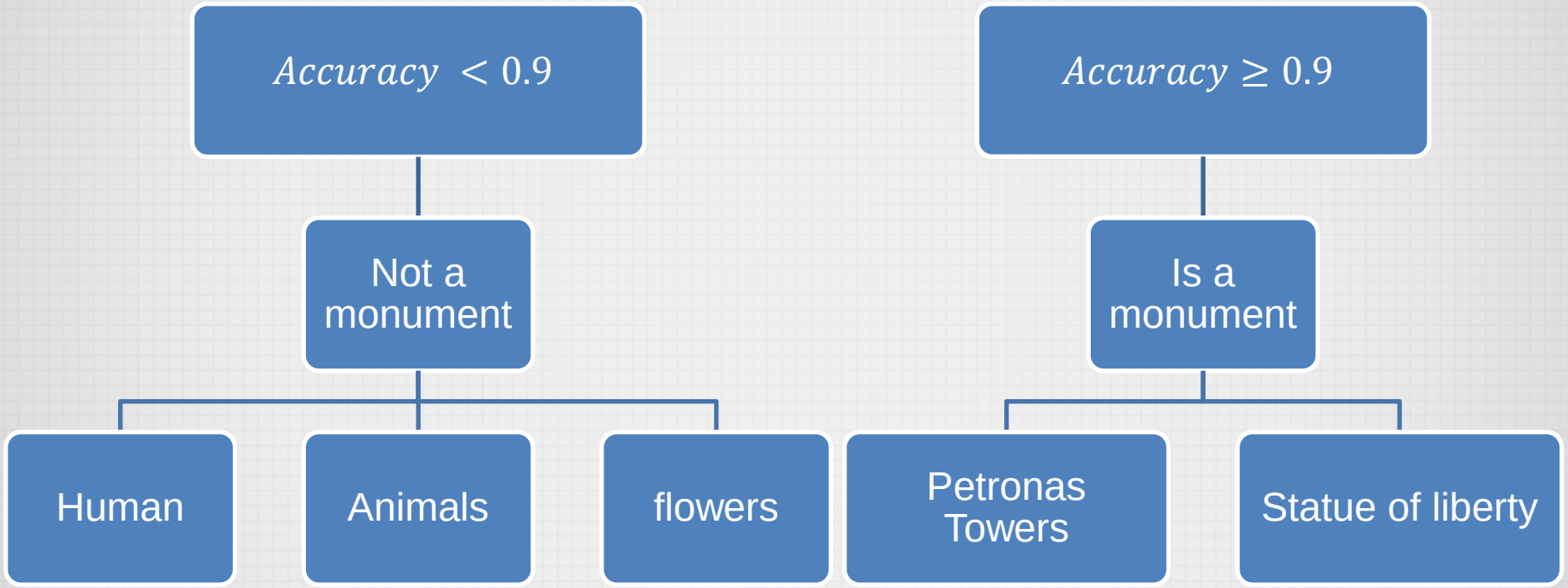
Upload an image

Label of the image

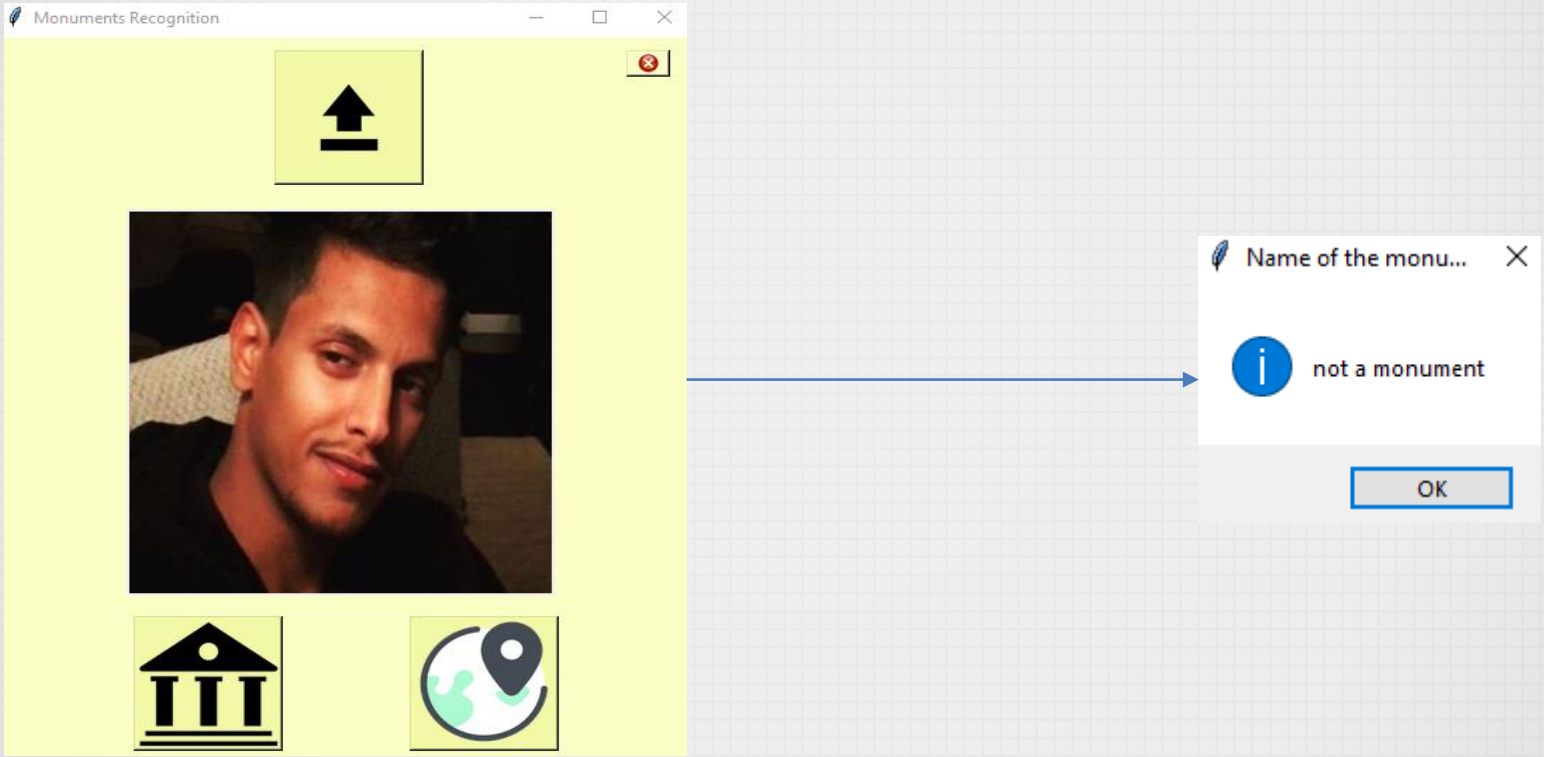
Get the name

Get the location

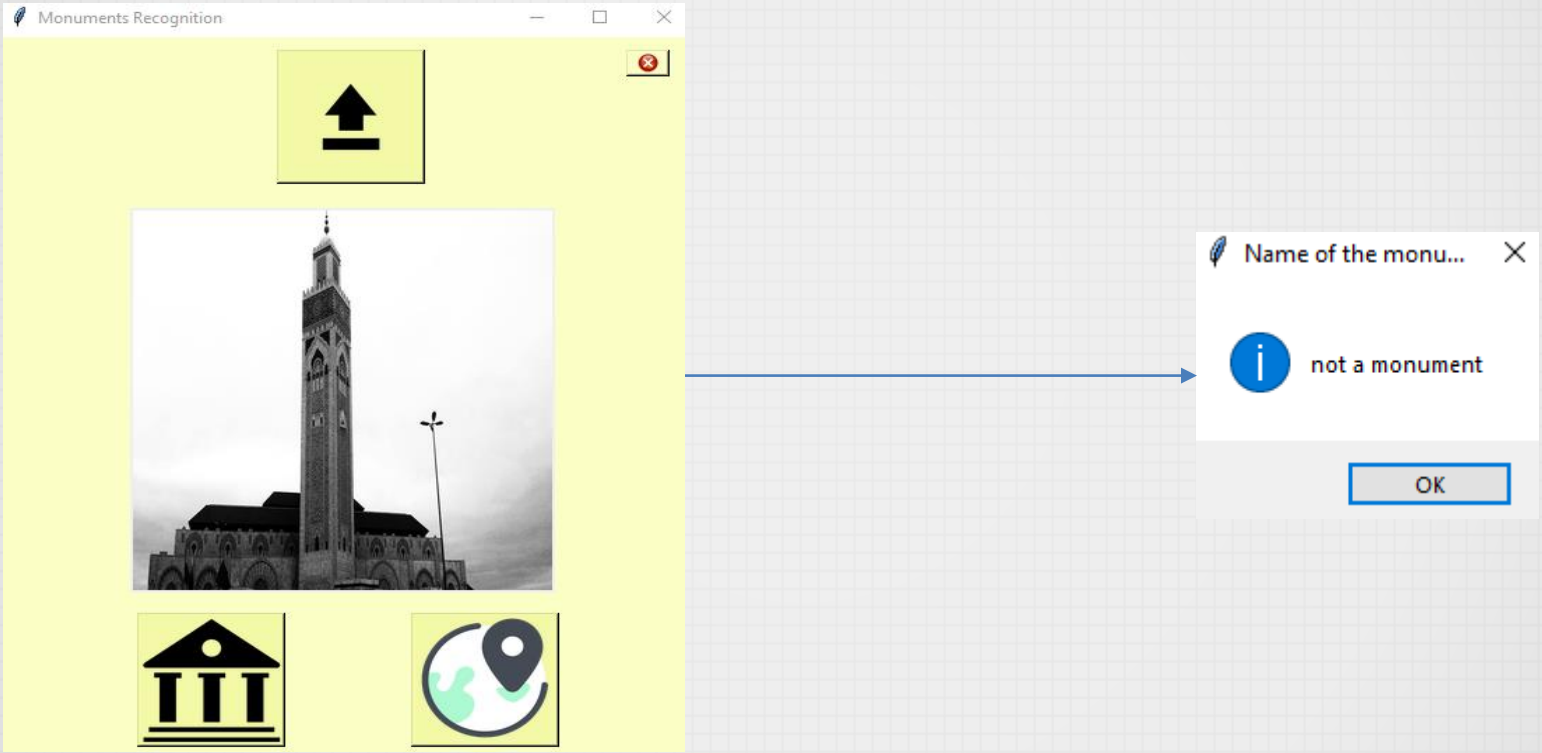
Testing the model: Not a monument



Testing the model: Not a monument



Testing the model: Not a monument



Prospects:

Add more monuments in the dataset.

Add a button for training the new images.

Design mobile application for the interface.