SI Project

Supervised By:
Eng. Amr Ahmed Abdelbaqi

Team members

Abdullah Mahmoud
Ahmed Hamdy Mohamed
Ahmed Mahmoud Hafez

Agenda

Classical Models

- Data preprocessing
- Feature extraction
- Models Used
- Models Evaluation

Deep-Learning Models

- Data preprocessing
- Feature extraction and Selection
- Models Used
- Models Evaluation

Coloring Flood Pixels

Classical Models

Data preprocessing

- **Resizing Images to be all the same.**
- **Remove some noise from it using Blurring.**

Feature extraction

- *Histogram of oriented gradients*
- *Local Binary Pattern*
- *GLCM*

Models Used

- *Logistic Regression*
- *Random Forrest*
- *Naive bayes*

Models Evaluation

(with respect to macro F1-score)

Model/feature	LBP	Histogram	LBP +Histogram
Logistic Regression	0.79	0.73	0.79
Random Forrest	0.79	0.80	0.79
Naive bayes	0.84	0.76	0.77

Models Evaluation

Model/feature	LBP			Histogram			LBP +Histogram		
	P.	R.	F1.	P.	R.	F1.	P.	R.	F1.
LR 0	.73	.89	.80	.67	.84	.74	.73	.89	.80
LR 1	.88	.71	.79	.82	.63	.71	.88	.71	.79
RF 0	.74	.85	.79	.8	.76	.78	.81	.74	.77
RF 1	.85	.73	.79	.8	.84	.82	.78	.85	.81
NB 0	.82	.86	.84	.72	.80	.76	.73	.80	.77
NB 1	.87	.83	.85	.81	.72	.76	.81	.73	.77

Models Evaluation

Model/feature	LBP			Histogram			LBP +Histogram		
	Acc	OE.	CE.	Acc.	OE.	CE.	Acc.	OE.	CE.
LR	.79	28.5	12.5	.73	36.7	18.4	.79	28.5	12
RF	.79	26.5	15.2	.8	16.3	20.3	.79	15.3	21
NB	.84	17.3	12.9	.76	27.5	19.3	.77	26.5	19

Models Evaluation

(W.R.T To Confusion Matrix)

Model/feature	LBP	Histogram	LBP +Histogram
Logistic Regression	[[77 10] [28 70]]	[[73 14] [36 62]]	[[77 10] [28 70]]]
Random Forrest	[[74 13] [26 72]]	[[66 21] [16 82]]	[[64 23] [15 83]]
Naive bayes	[[75 12] [17 81]]	[[70 17] [27 71]]	[[70 17] [26 72]]

Models Evaluation

(Model Evaluation using GLCM)

Model/Matrix	F1 macro	OE	CE	ACC.	Conf Matrix
Logistic Regression	.77	21.4	21.4	.77	[[66 21] [21 77]]
Random Forrest	.84	15.31	14.43	.84	[[73 14] [15 83]]
Naive bayes	.8	18.73	19.2	.8	[[68 19] [18 80]]

Models Evaluation

Model/feature	GLCM		
	P.	R.	F1.
LR 0	.76	.76	.76
LR 1	.79	.79	.79
RF 0	.83	.84	.83
RF 1	.86	.85	.85
NB 0	.79	.78	.79
NB 1	.81	.82	.8

Deep-Learning Models

Data preprocessing

- **Data Augmentation**
- **Data Splitting**

Steps to Train Model

- **MoblieNet**
- **Transfer learning using ImageNet Weights**

HyperParameter Tuning

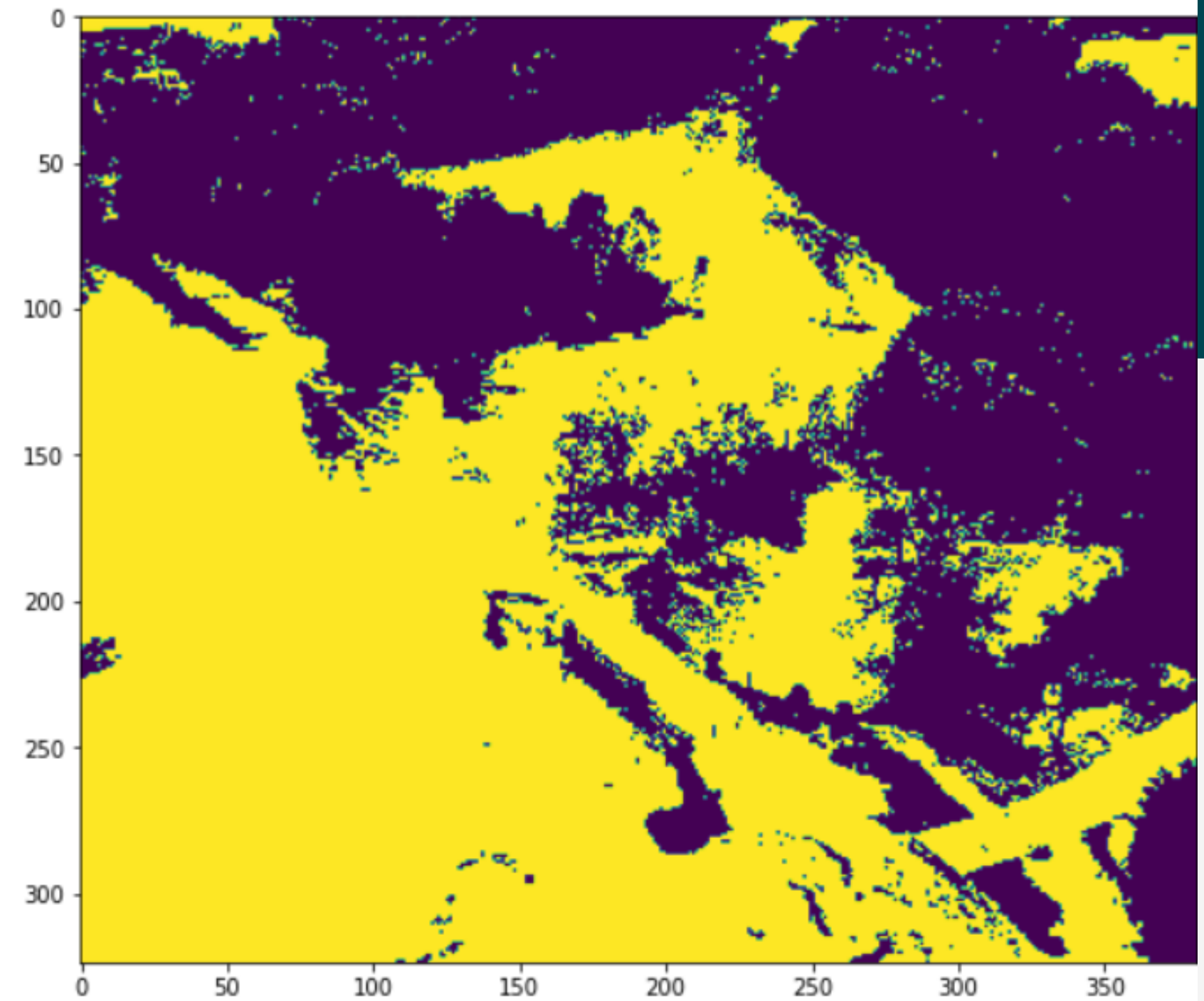- *Tune the number of trained layers and the optimal one is used*
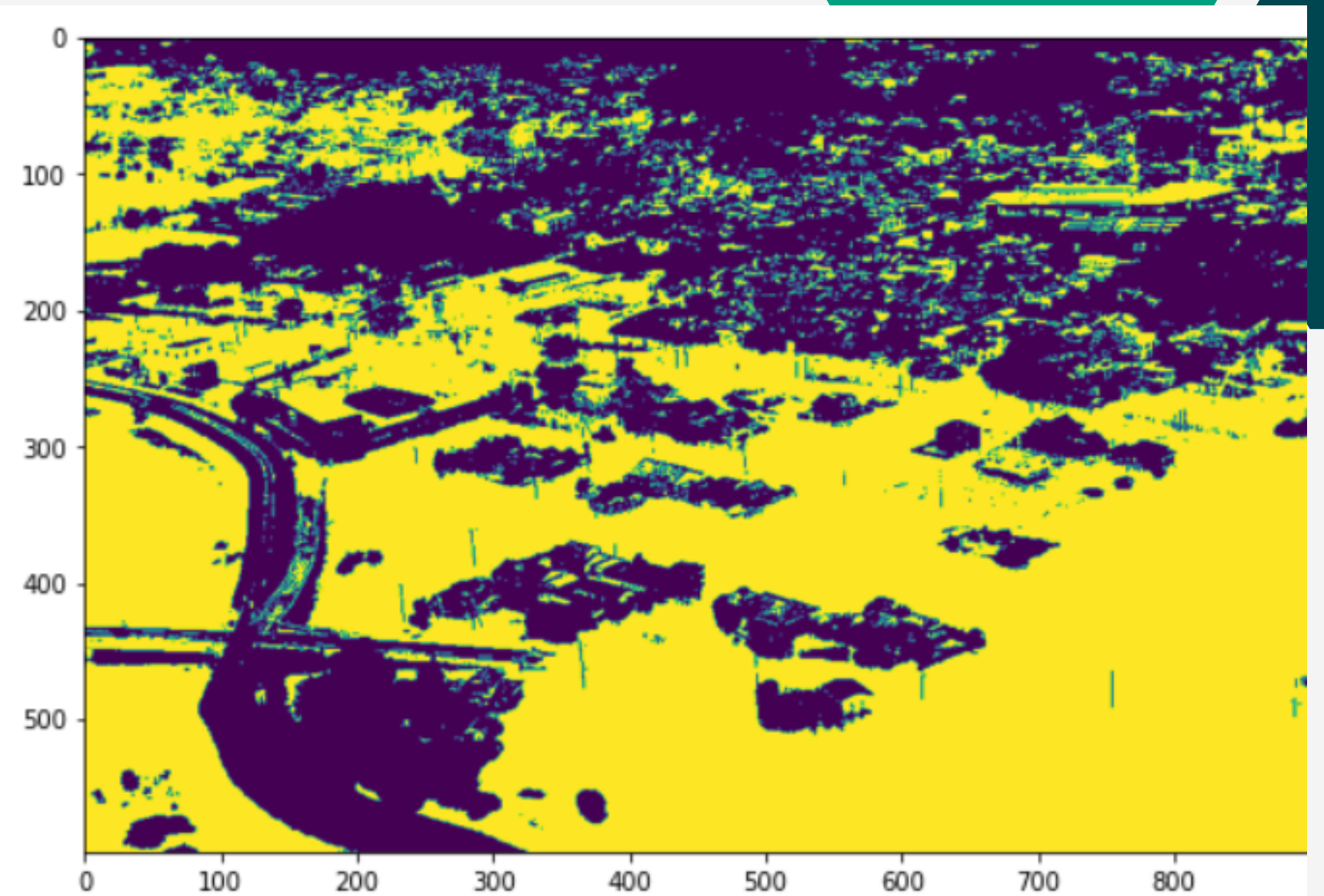
Models Evaluation

- *Training : 98.5%*
- *Test:97%*

Coloring
Flood Pixels

Kmeans

ISOData

Thank You