“Politehnica” University of Bucharest

The Faculty of Electronics, Telecommunications and Information Technology

FACIAL ANALYSIS METHOD FOR RECOGNIZING THE EXPRESION OF SURPRISE

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Agenda

- Introduction to facial analysis
- Why have I chosen Emotion detection?
- How it works?
- Results
- Demo
- Conclusions
- Q&A





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Introduction to facial analysis

Identifying or verifying a person

Machine Learning

Artificial Inteligence

A ton of features

Automation (More and more powerfull)

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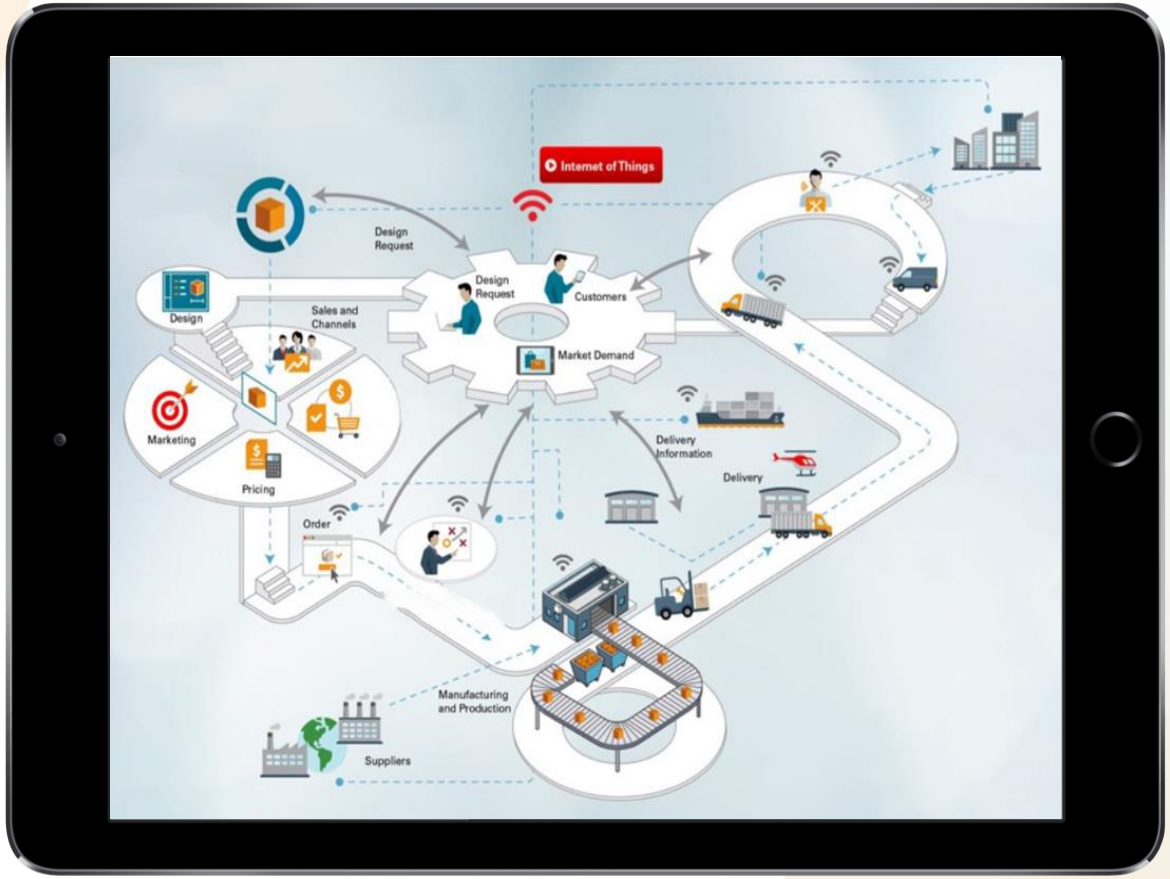
Why Emotion Detection?



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The Scheme:

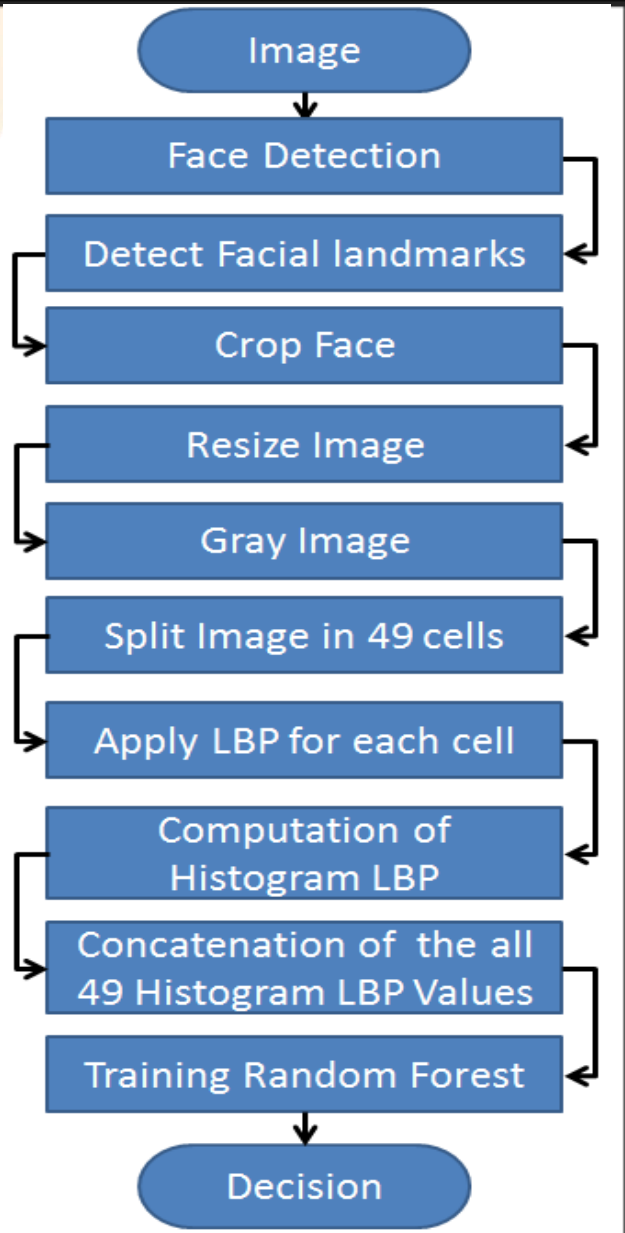
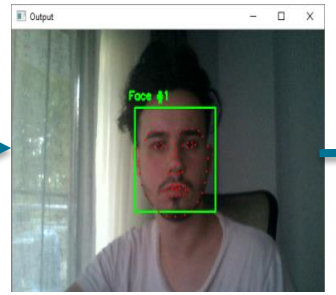


Image
Face Detection
Detect Facial landmarks
Crop Face
Resize Image
Gray Image
Split Image in 49 cells
Apply LBP for each cell
Computation of Histogram LBP
Concatenation of the all 49 Histogram LBP Values
Training Random Forest
Decision

How It works

Image



Detect Facial FaciLandmarks
&
The Face

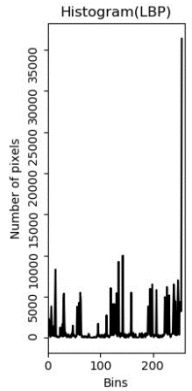
Crop the Face

Gray Image

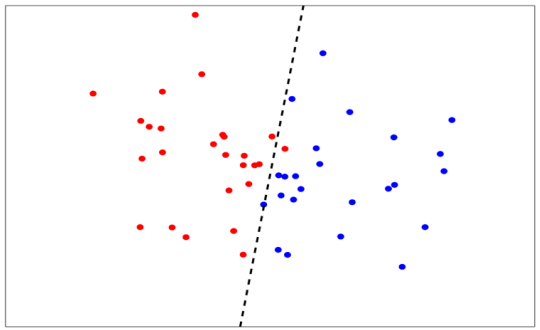
Split in 49 cells

Apply LBP for each cell

Computation of the
Histogram



Train Random Forest



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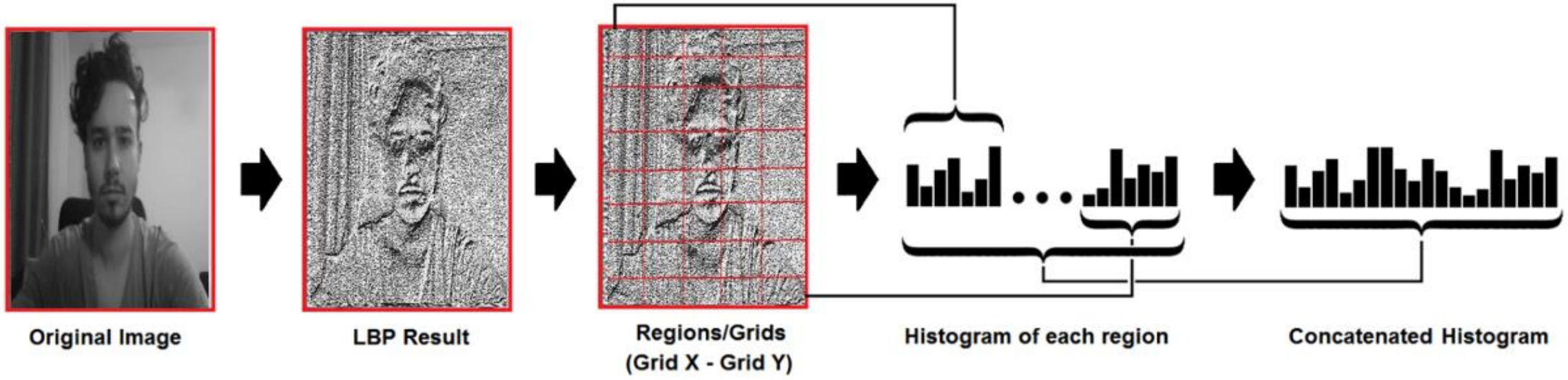
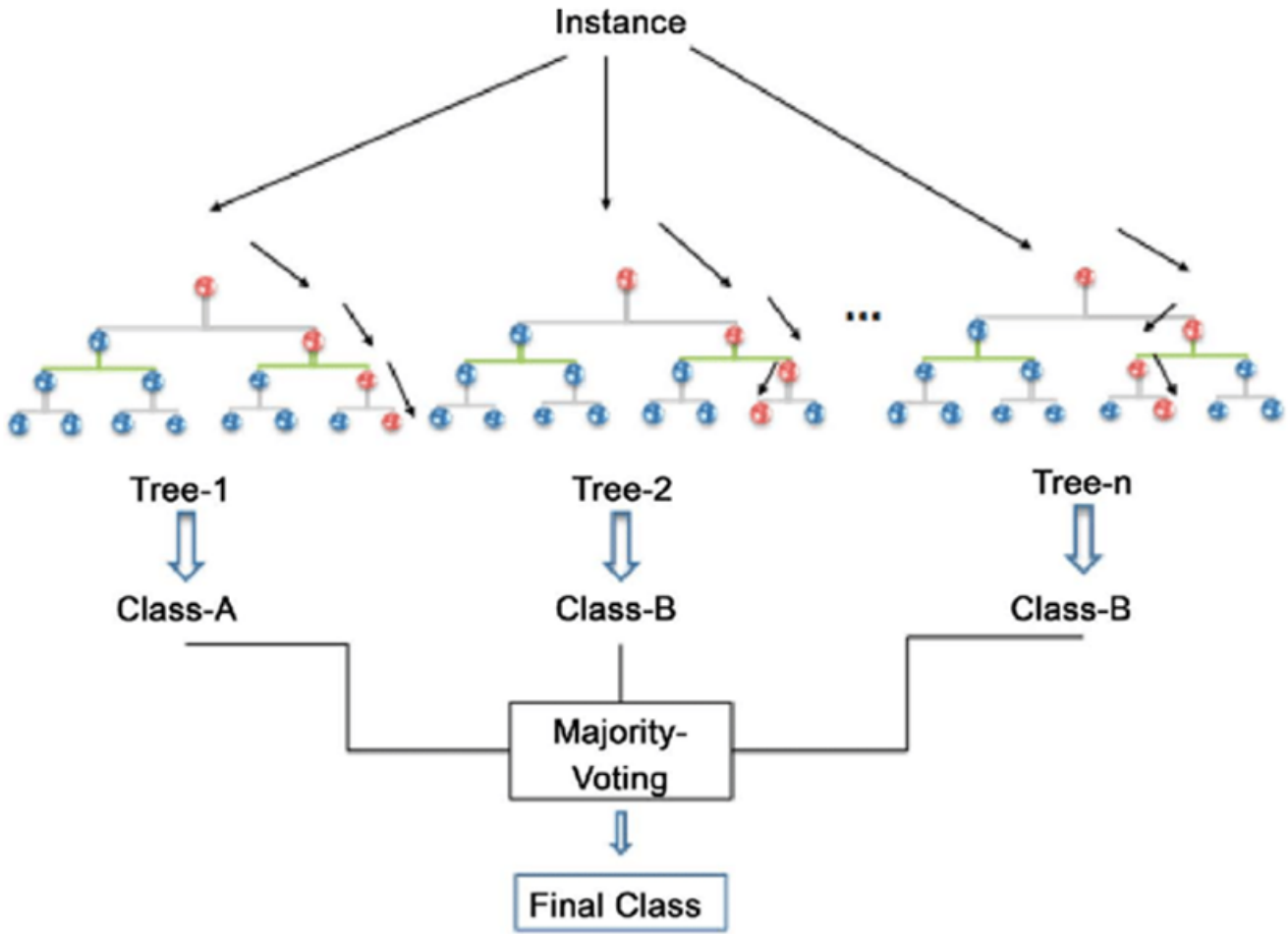
Local Binary Pattern



Random Forest Classifier



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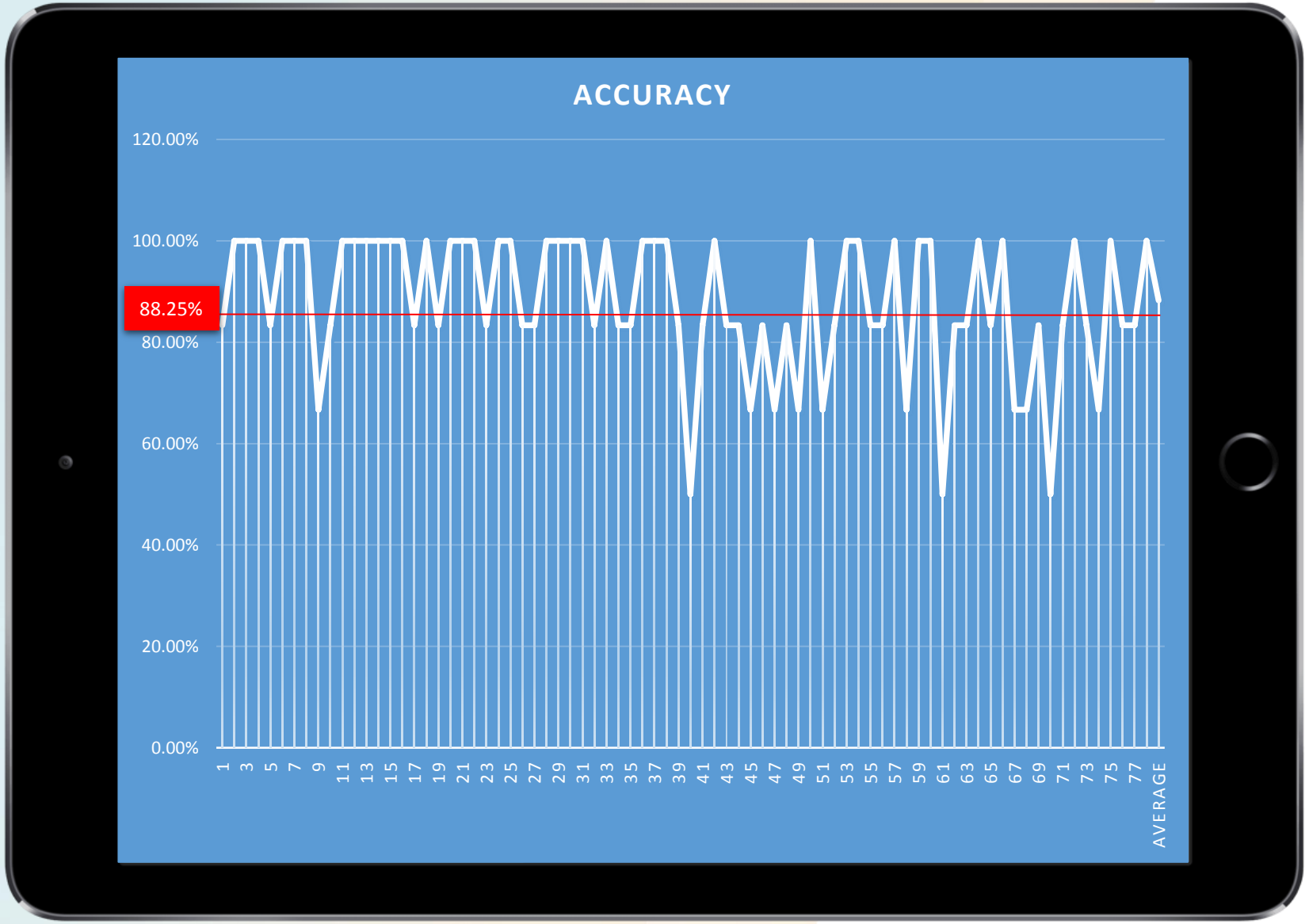
Experimental Results



Tests and Results from Subjects Perspective

- 78 subjects
- 3 photos that express surprise, and 3 other photos that express another emotion
- 30 Hours
- 22932 photos for each test

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Experimental Results

	SURPRISE	NEUTRAL	HAPPINESS	FEAR	CONTEMPT	SADNESS	DISGUST	ANGER
TOTAL PHOTOS	231	82	43	21	23	29	9	30
CORRECT	90.04%	85.37%	83.72%	95.24%	82.61%	89.66%	88.89%	86.67%
INCORRECT	9.96%	14.63%	16.28%	4.76%	17.39%	10.34%	11.11%	13.33%

Tests and Results from Emotion Perspective

90,04%

9,96%

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Conclusion

Very good accuracy on the tested dataset

A lot of practicality in real life

Can be implemented almost everywere

The Drawbacks

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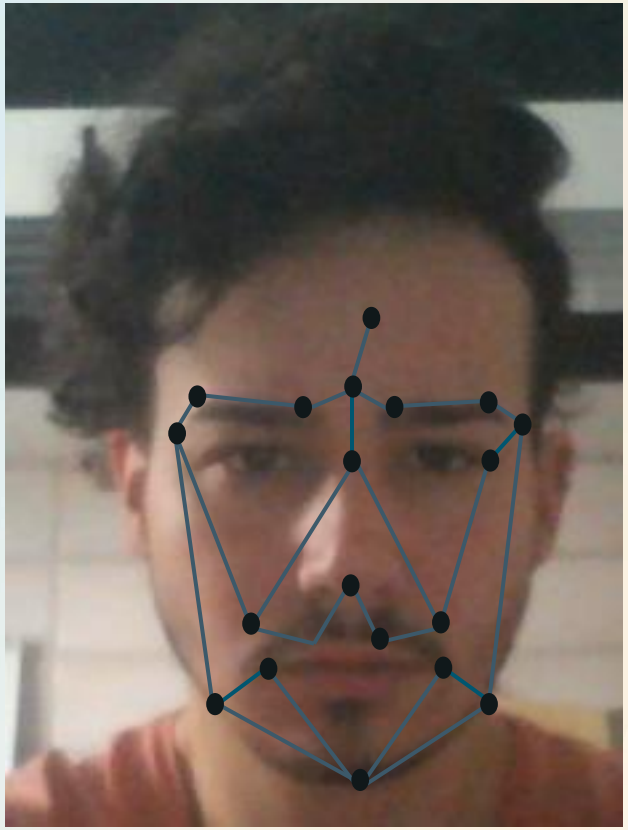
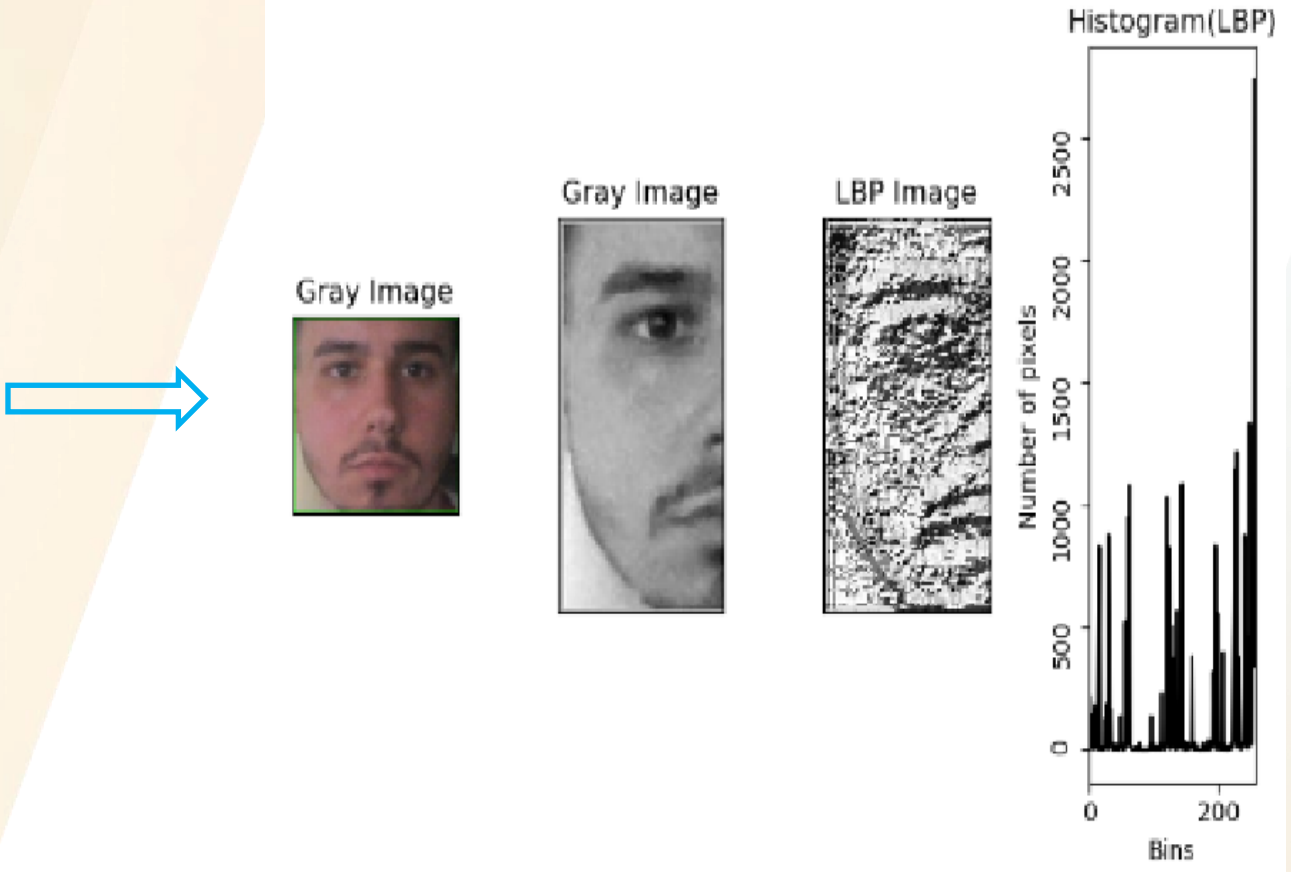
Demo




Gray Image
Gray Image
LBP Image
Histogram(LBP)
Number of pixels
0
500
1000
1500
2000
2500
0
200
Bins

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Q&A

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