



FACULTÉ DES SCIENCES DHAR EL MAHRAZ  
UNIVERSITÉ SIDI MOHAMED BEN ABDELLAH

# Classification Des Micro Expressions



Mood Check

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# PLAN

Etude de l'existant

Cahier de charge

Outils

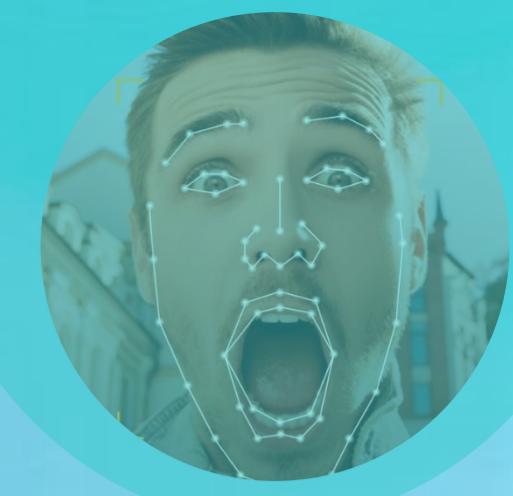
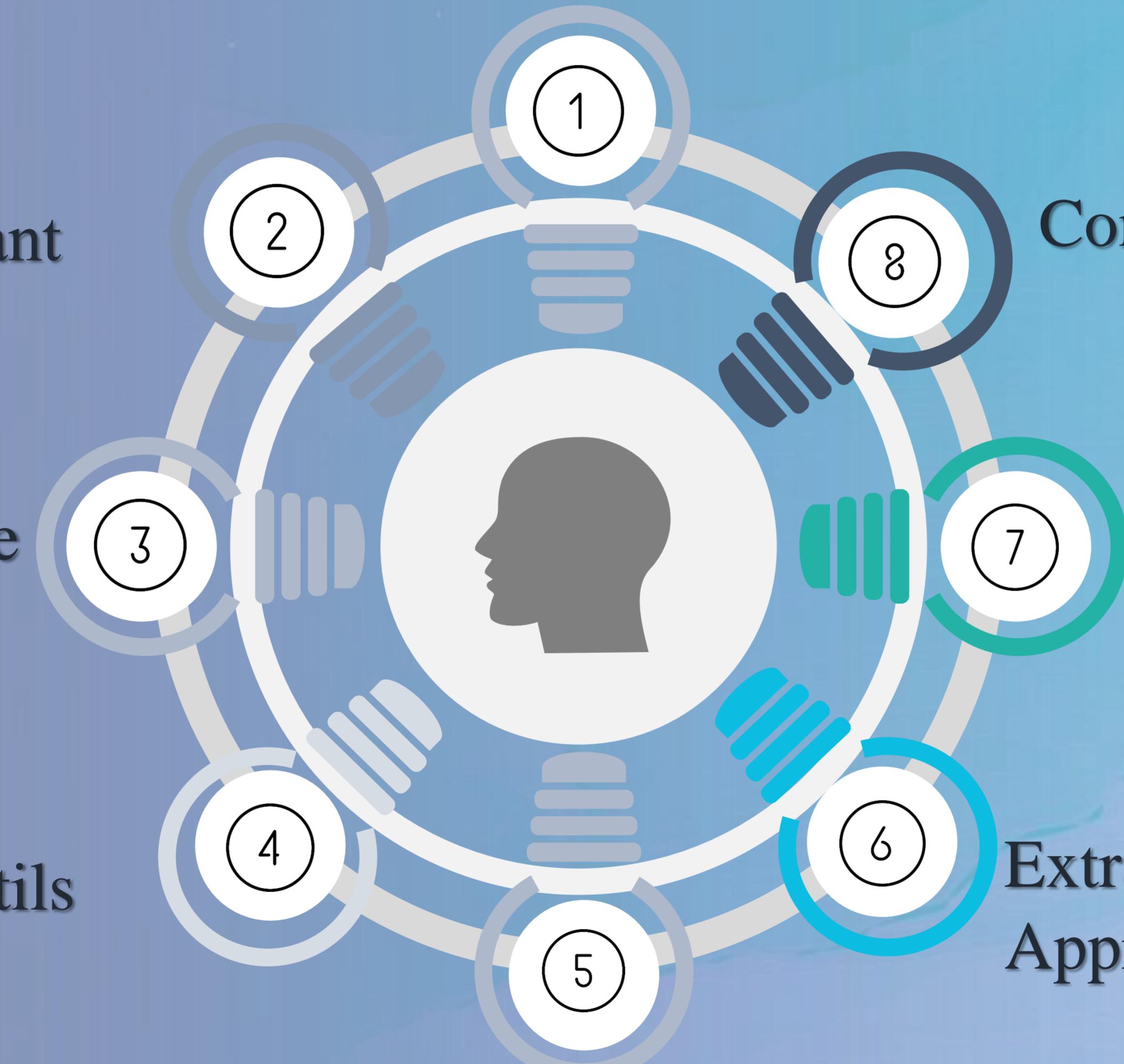
Introduction

Choix Data Sets

Extraction des Features et  
Apprentissage

Démonstration

Conclusion



# INTRODUCTION

- ♂ C'est quoi une micro expression?
- ♂ Pourquoi?
- ♀ Comment?



# Etude de l'existant



Peekabeat



Feely



Emotion Recognition

## ■ Points forts :

- ✓ Déetecter et classer les micro expressions.
- ✓ La reconnaissance ce fait localement.

## ■ Points faibles :

- ✗ Basé sur l'utilisation d'une autre application pour accomplir sa tâche.
- ✗ Pas de statistiques.

# Cahier de charges

## □ Besoins fonctionnels



Capturer une image ou de la télécharger depuis la galerie afin de détecter la nature de sa micro expression.



Avoir des statistiques *sur* son état émotionnelle.



Avoir des notifications concernant les statistiques.

## □ Besoins non fonctionnels



**La qualité :** facilité d'utilisation, bon design.



**La sécurité :** données de chaque utilisateur seront enregistrées localement, l'image requête ne sera pas conservé au niveau de notre serveur.

# Outils



**Python**



**Flask**



**Java**



**Jupyter**



**Android**



**Json**



**Colab**



**SQLite**

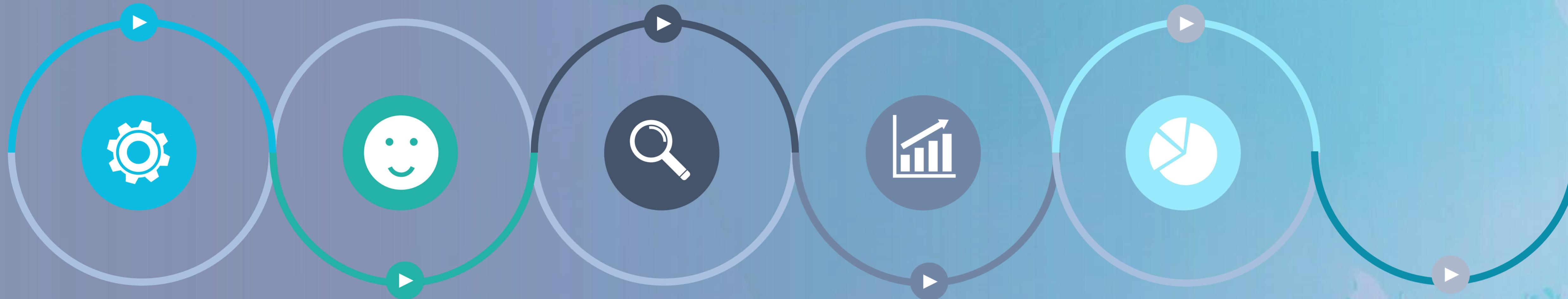
# Choix du Data sets

Nom de Data Sets	Caractéristiques
<b>Kohen &amp; kanade (CK+)</b>	- 1080 images - Bonheur, Dégout, Colère, Peur, Tristesse, Surprise.
<b>KDEF (Karolinska Directed Emotional Faces)</b>	- 4,900 images. - Bonheur, Dégout, Colère, Peur, Neutre, Tristesse, Surprise.
<b>FaceDB</b>	- 259 images. - Bonheur, Dégout, Colère, Peur, Neutre, Tristesse, Surprise.
<b>GoogleSet *</b>	- 181 images. - Bonheur, Dégout, Colère, Peur, Neutre, Tristesse, Surprise. - Pas utilisé (données aberrantes)
<b>CFD (Chicago Face DataBase)</b>	- 1203 images. - Bonheur, Colère, Peur, Neutre.
<b>Amsterdam Dynamic Facial Expression Set ADFES</b>	- 216 images. - Bonheur, Dégout, Colère, Peur, Neutre, Tristesse, Surprise.
<b>Data set Collecté)</b>	- 324 images. - Bonheur, Dégout, Colère, Peur, Neutre, Tristesse, Surprise.

# Extraction Features & Apprentissage établissem



# Schéma fonctionnel



**Préparation des  
Data Sets**  
(Taille utilisé: 3918)

**Extraction de  
visage**

**Extraction  
des Features**

**Normalisation  
des Features**

**Features  
Engineering**

**Apprentissage**

# Extraction de visage

- Algorithme Viola Jones :

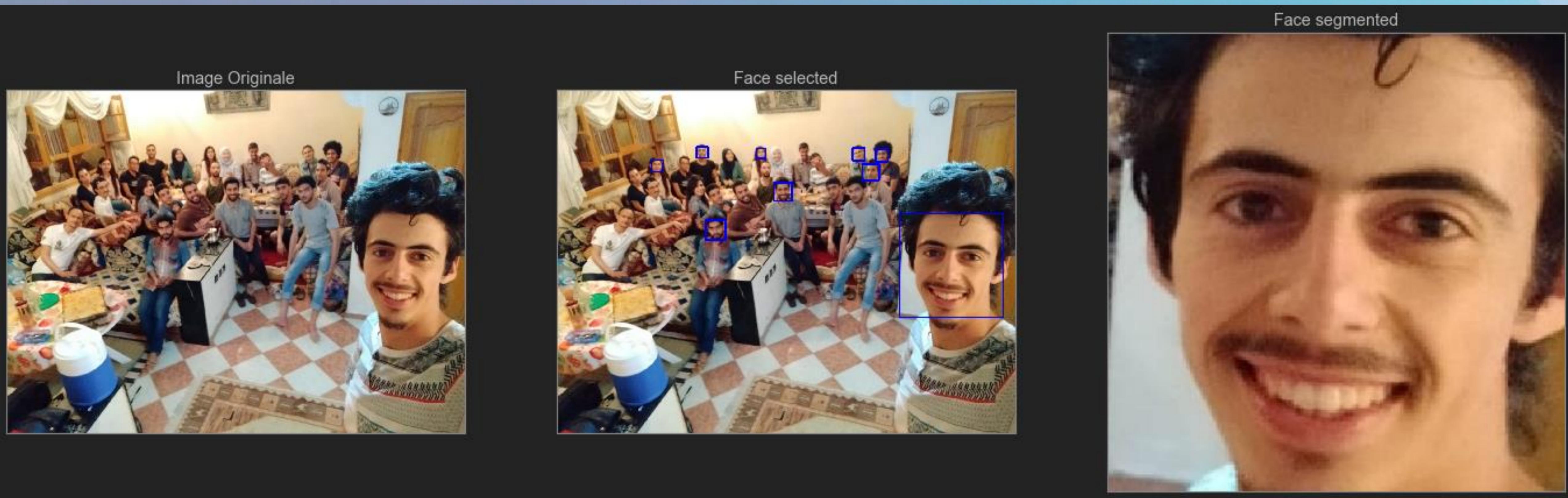


Image Originale

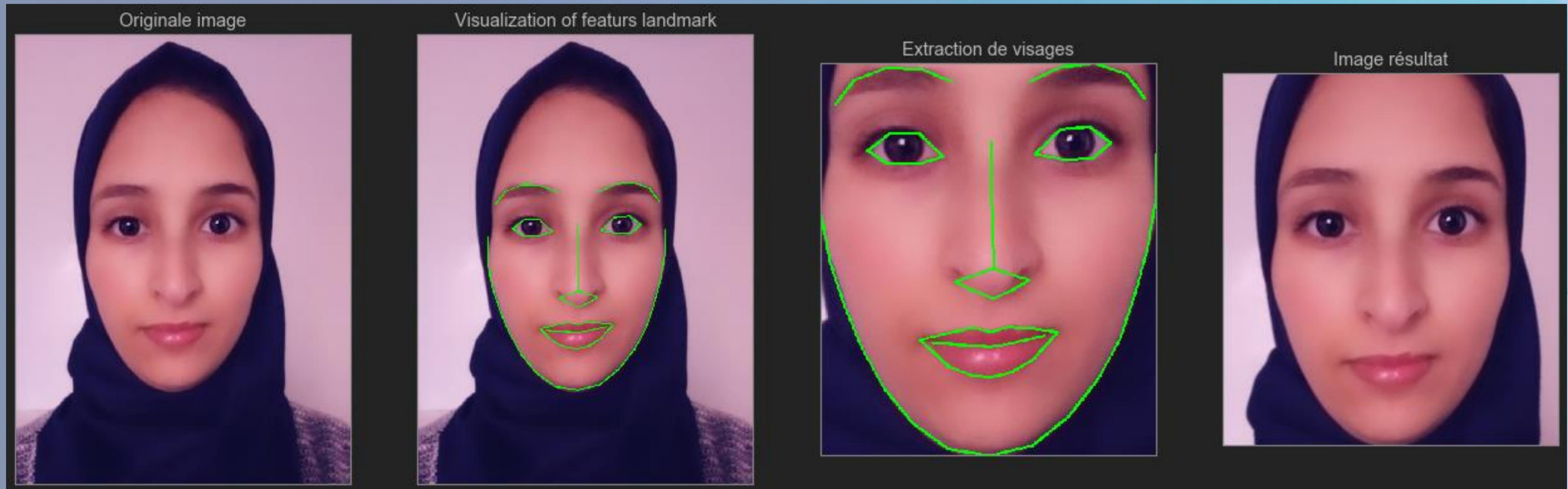
Face selected

Face segmented

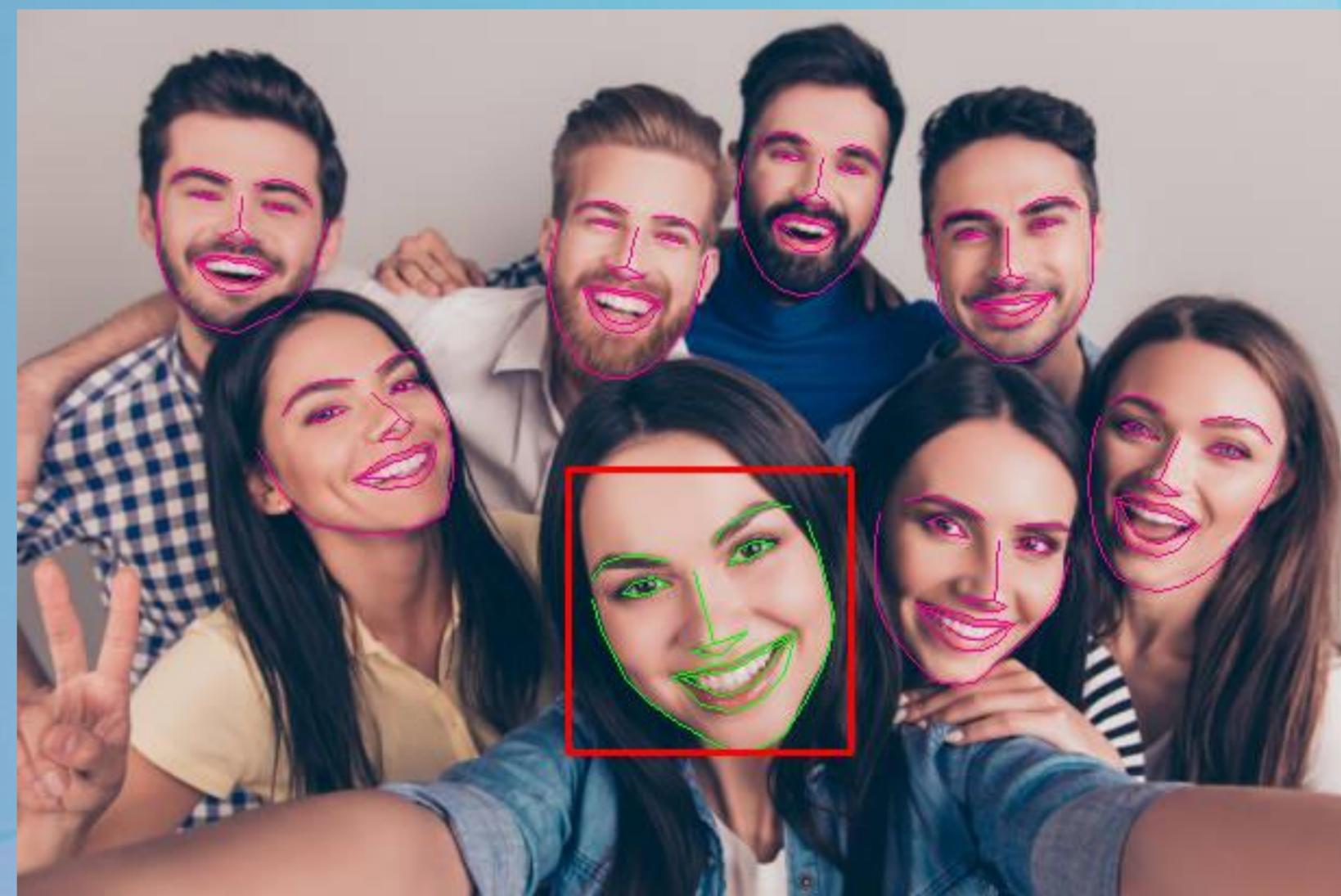


# Extraction de visage

- Algorithme Landmark :

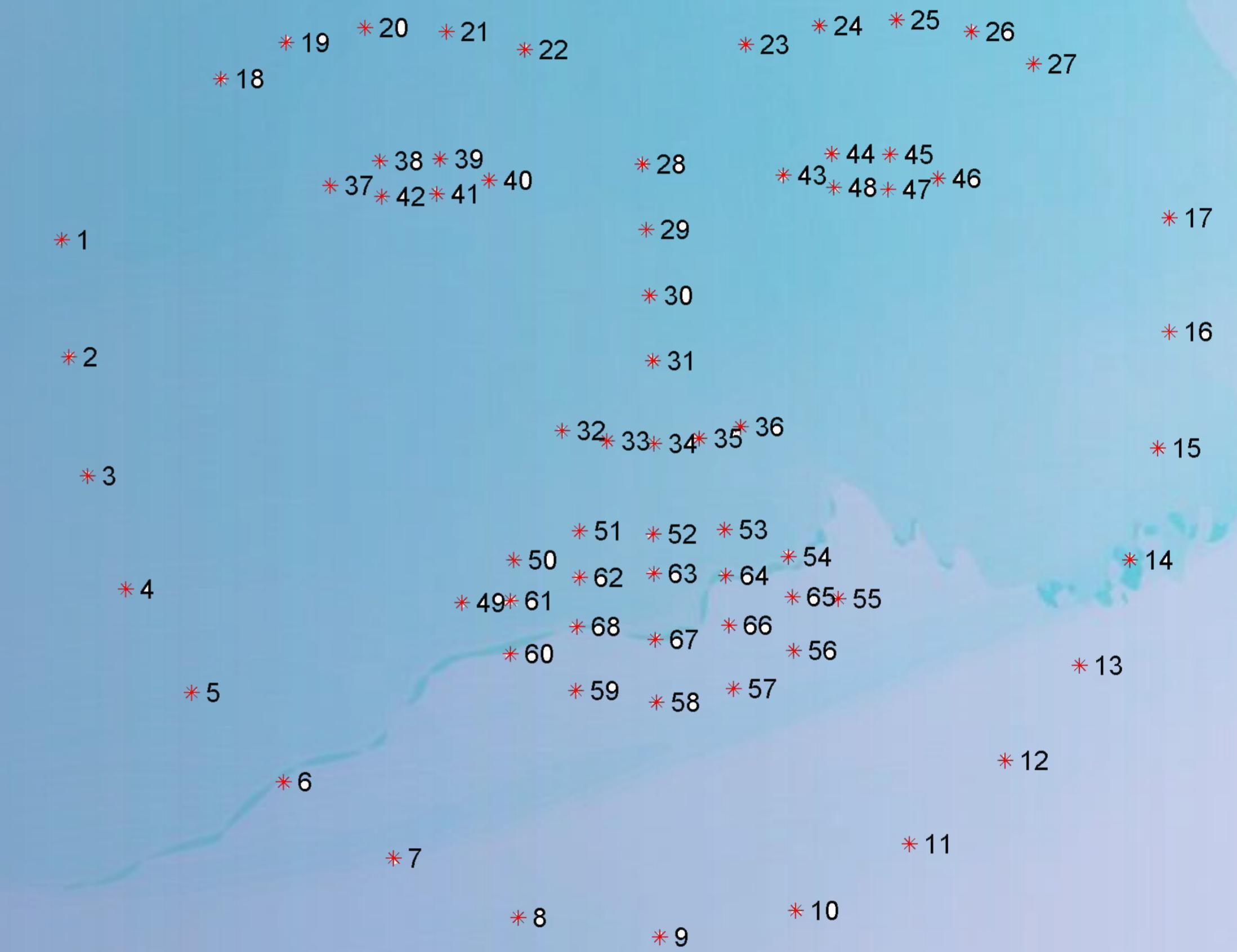
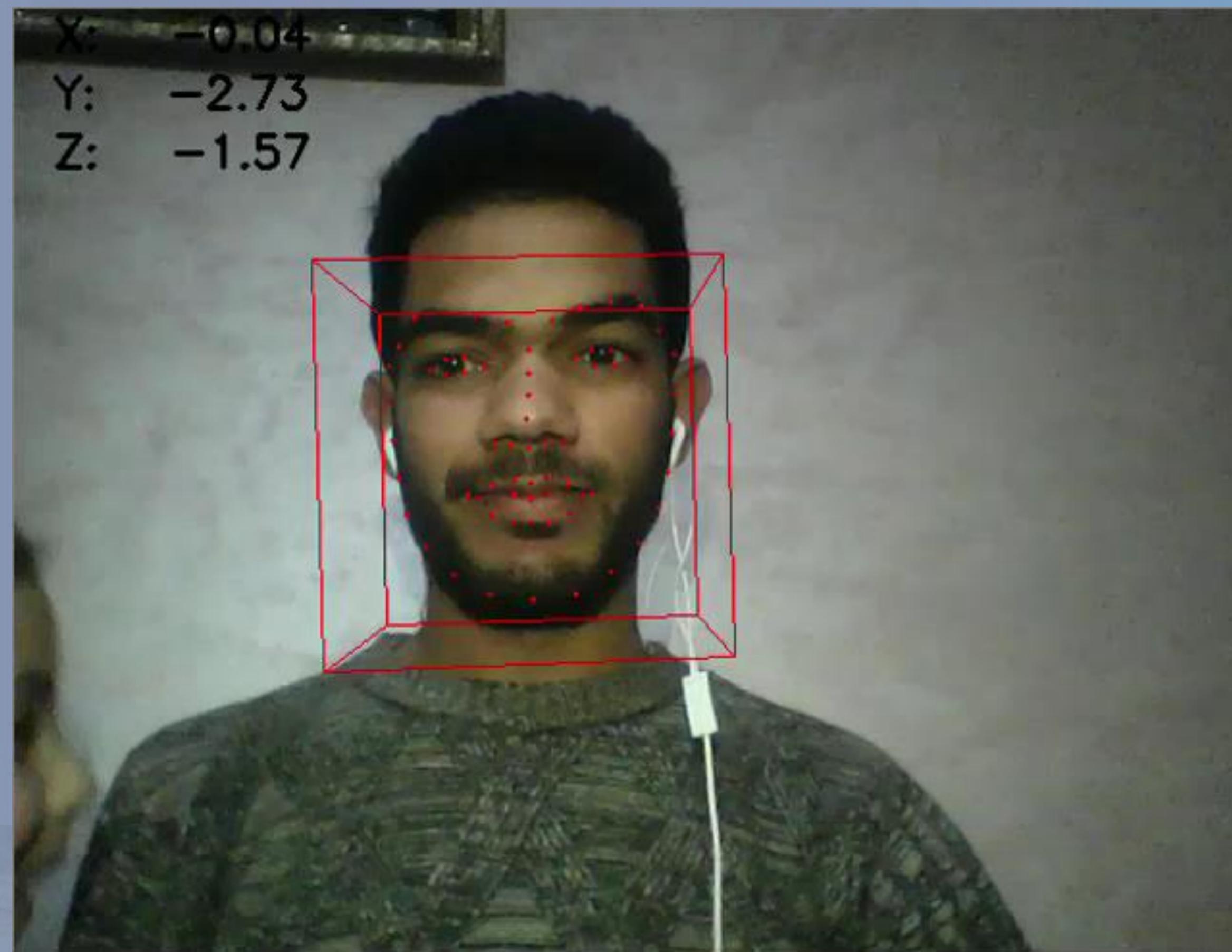


# Cas de multiple visages

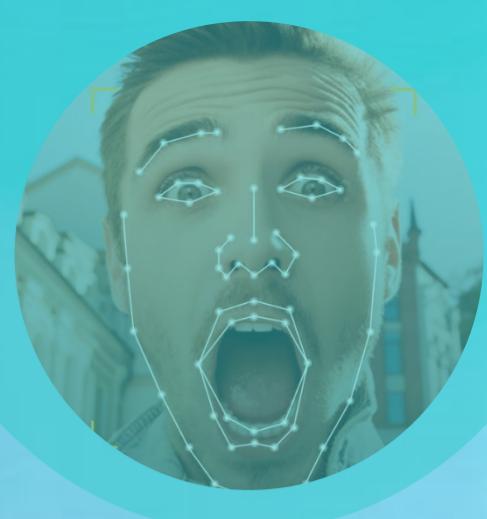


# Extraction de Features

## ■ Algorithme Landmark :



# Extraction de Features



- Algorithme Landmark personnalisé :

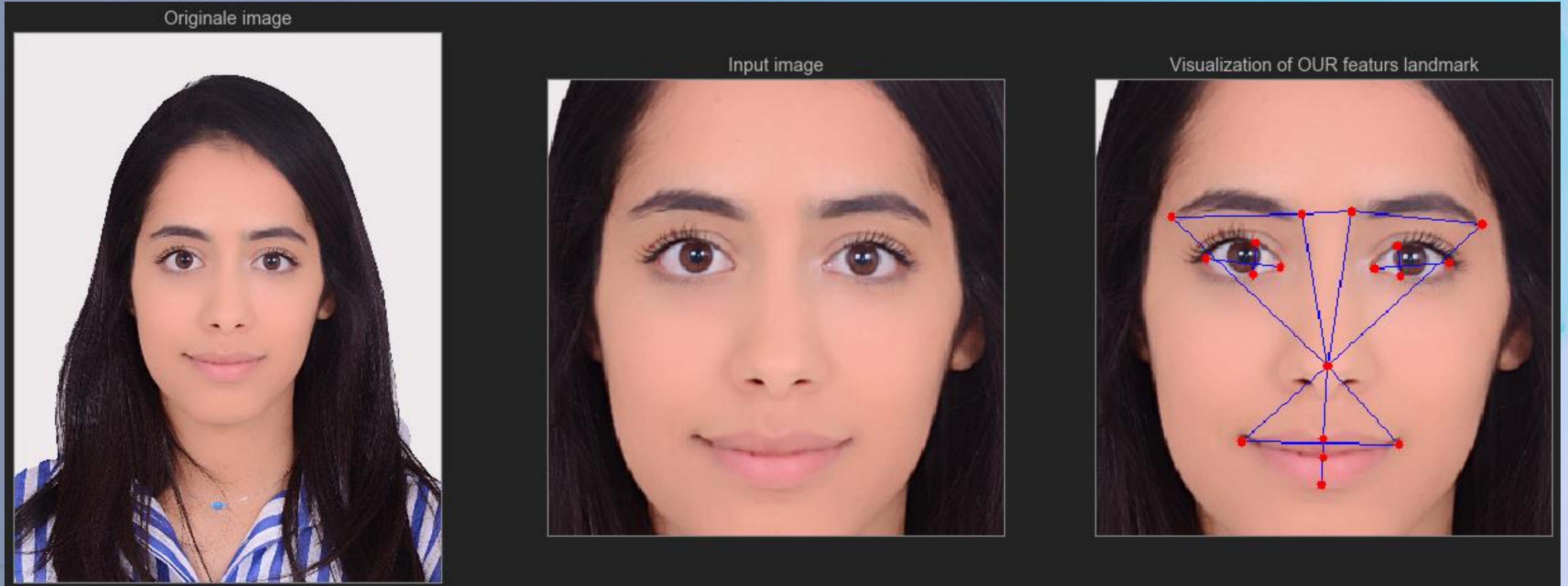
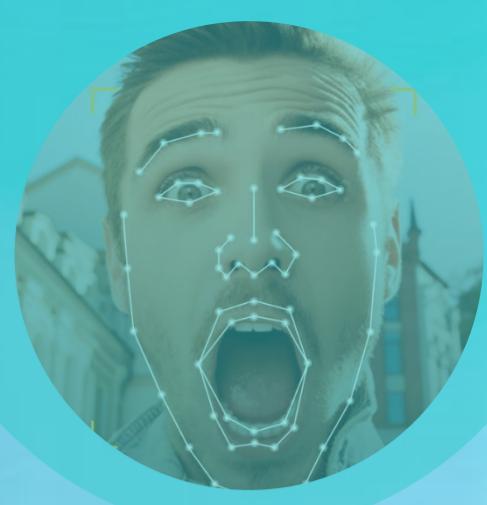


Image Originale

Input Image

Visualisation of OUR  
features Landmark

# Extraction de Features



- Algorithme Gabor Filters :

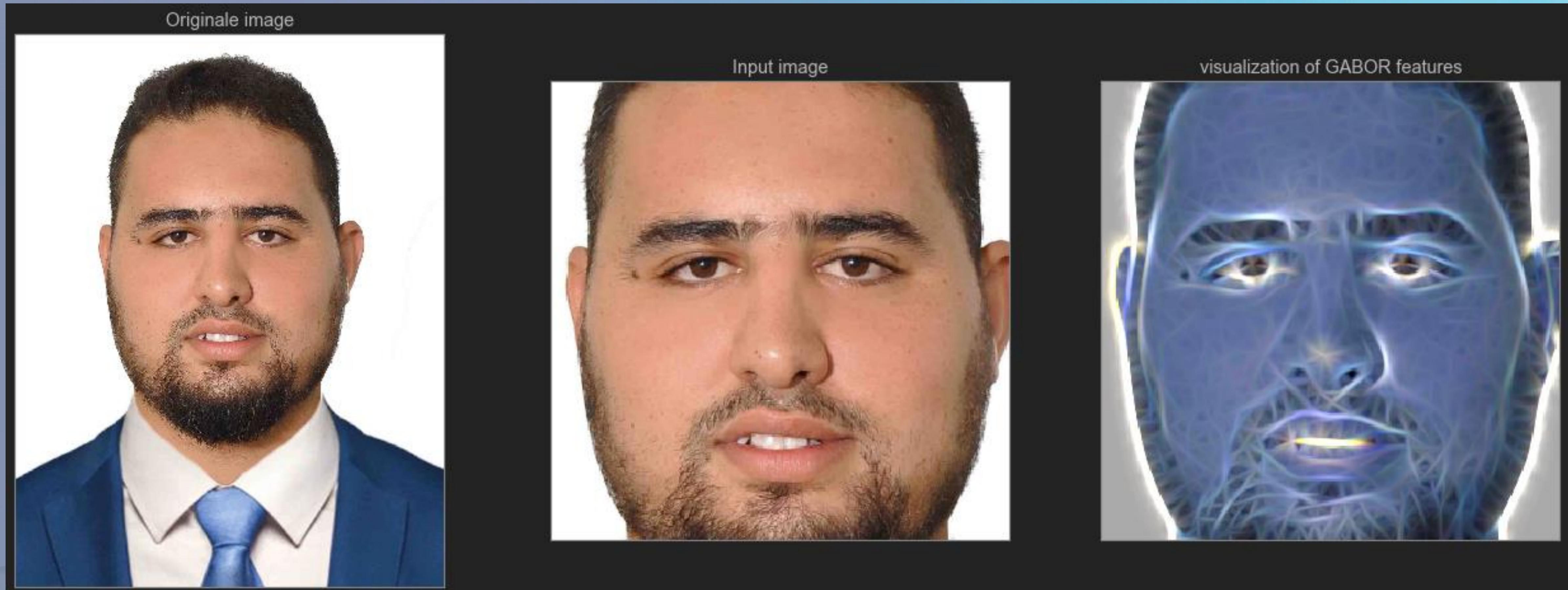


Image Originale

Image segmentée

Image résultat

# Extraction de Features

- Algorithme Histogram Oriented Gradient (HOG):

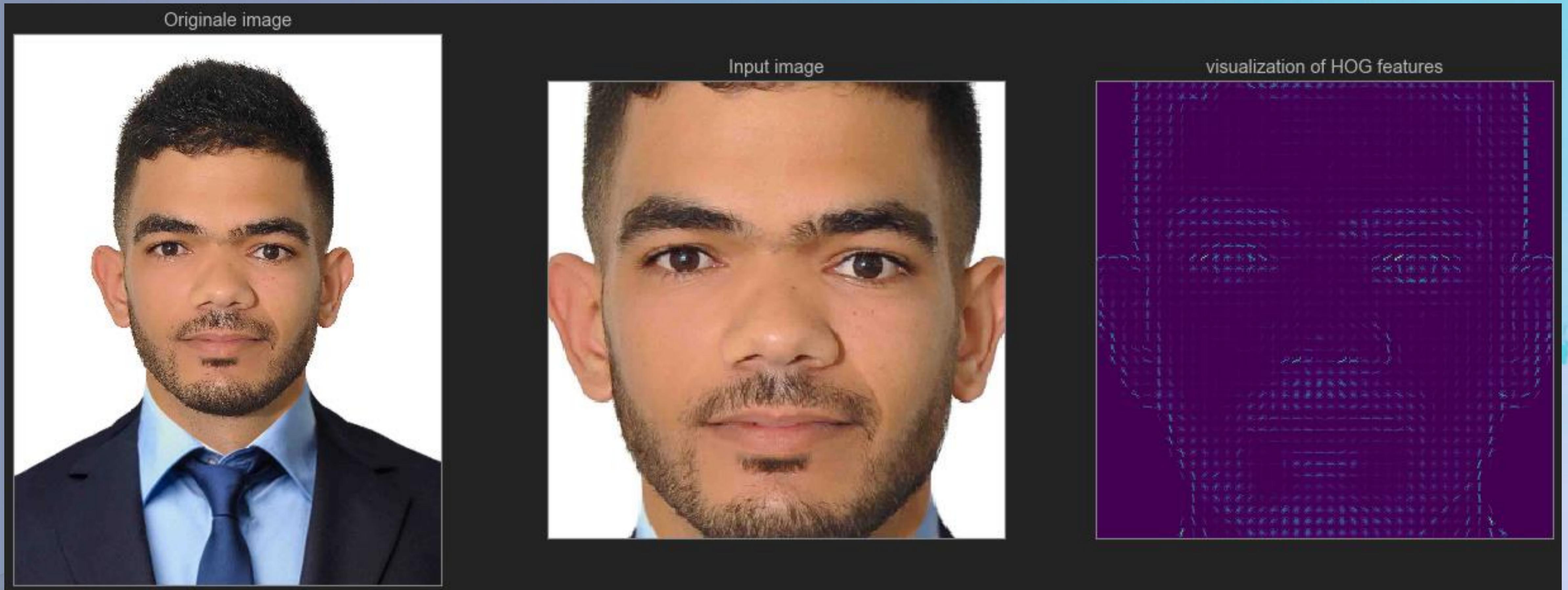


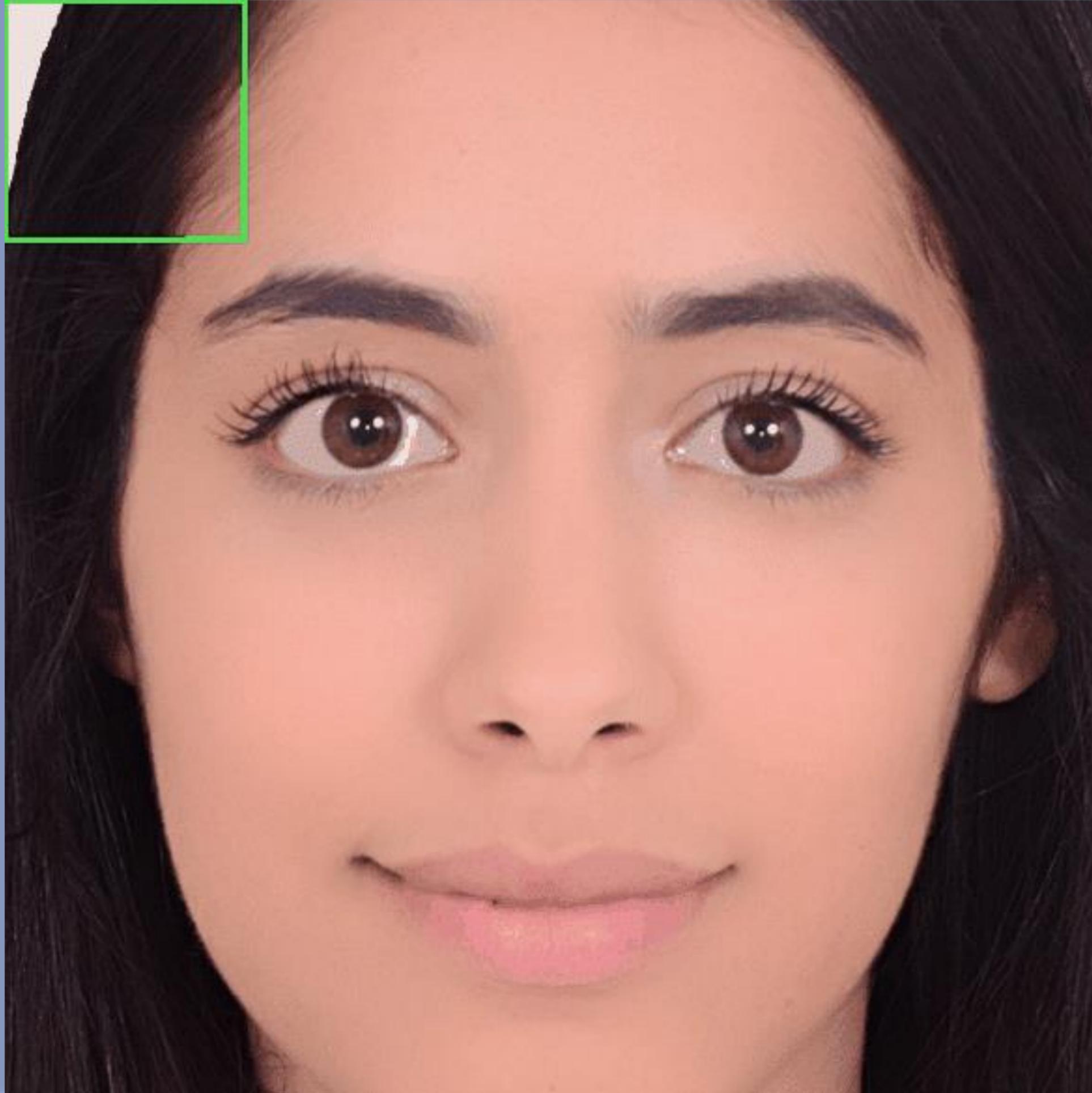
Image Originale

Input Image

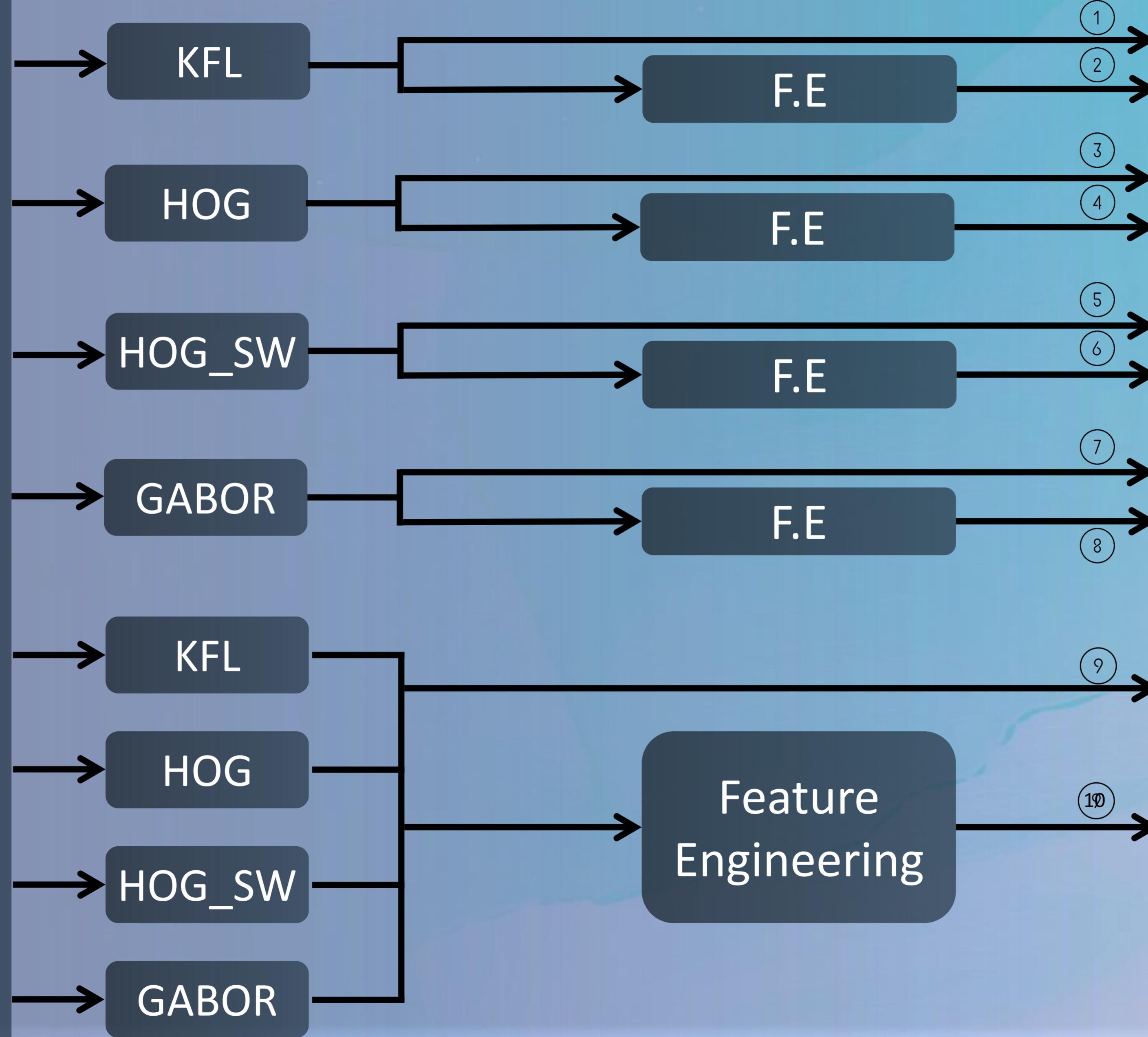
Visualisation of HOG  
features

# Extraction de Features

- Algorithme HOG Sliding Window :

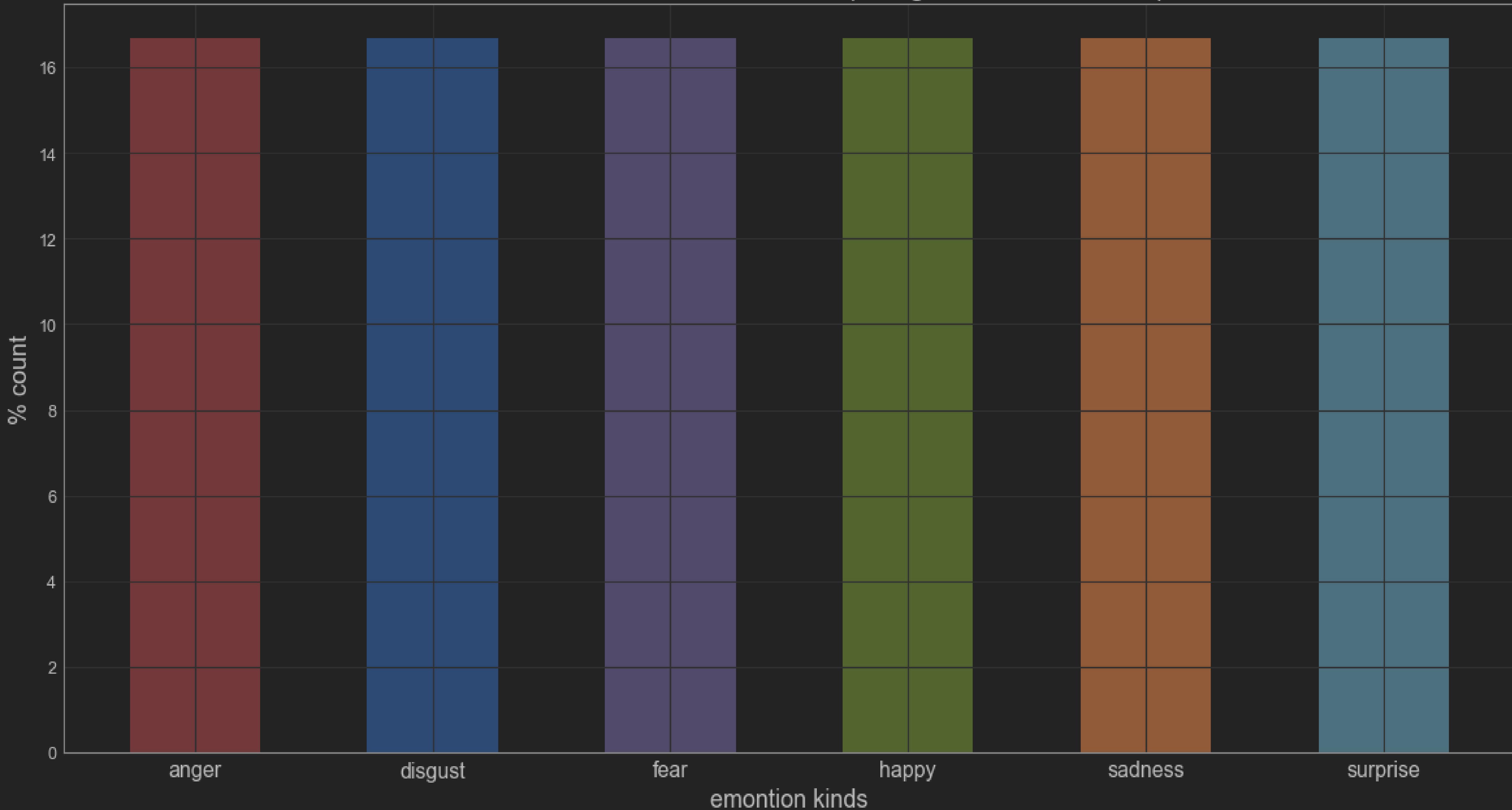


## Pre-processing

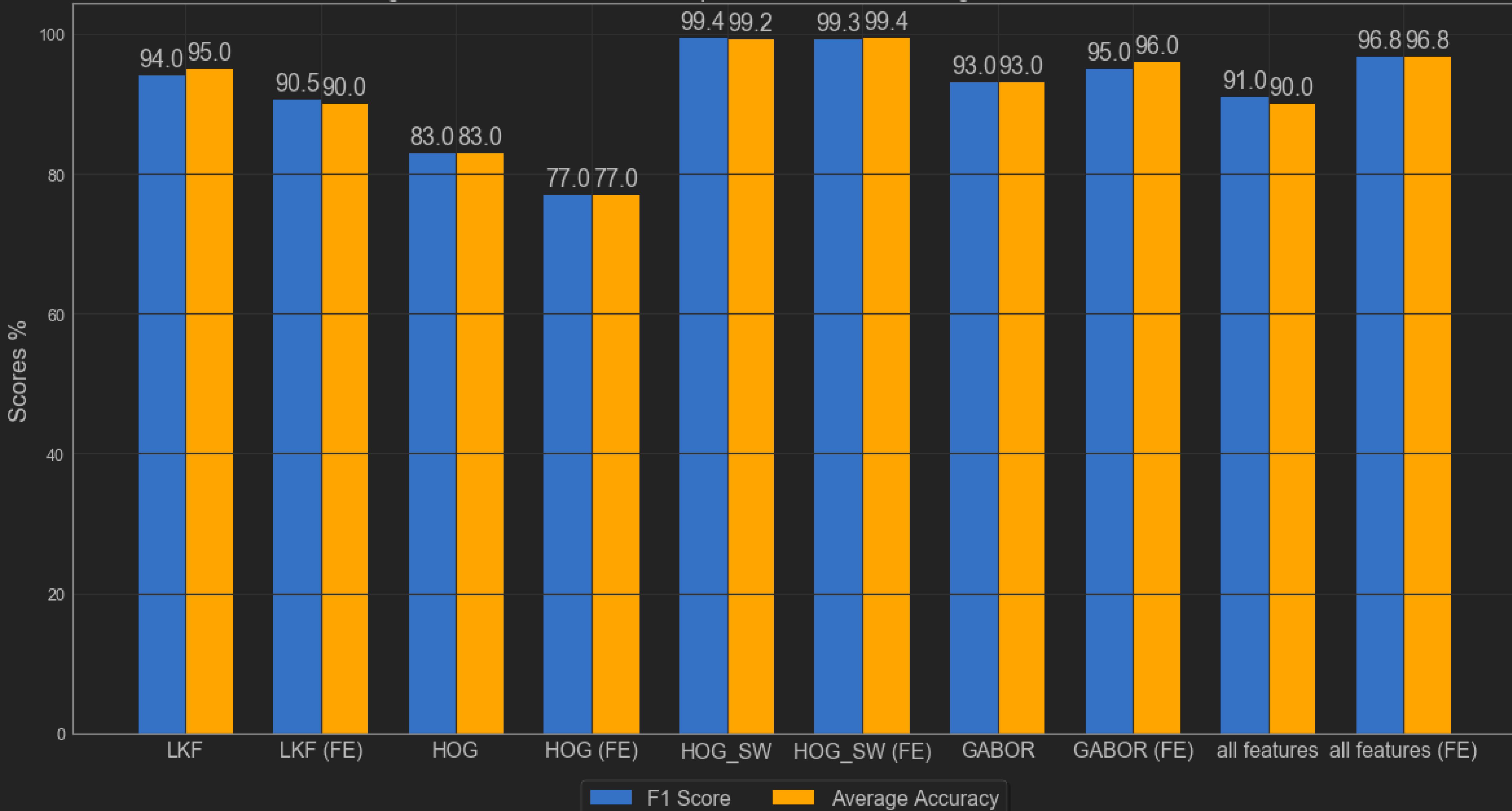


- Classifiers:
- ✓ SVM
  - lineare
  - rbf
  - ✓ LR
  - ✓ KNN
  - ✓ NBC

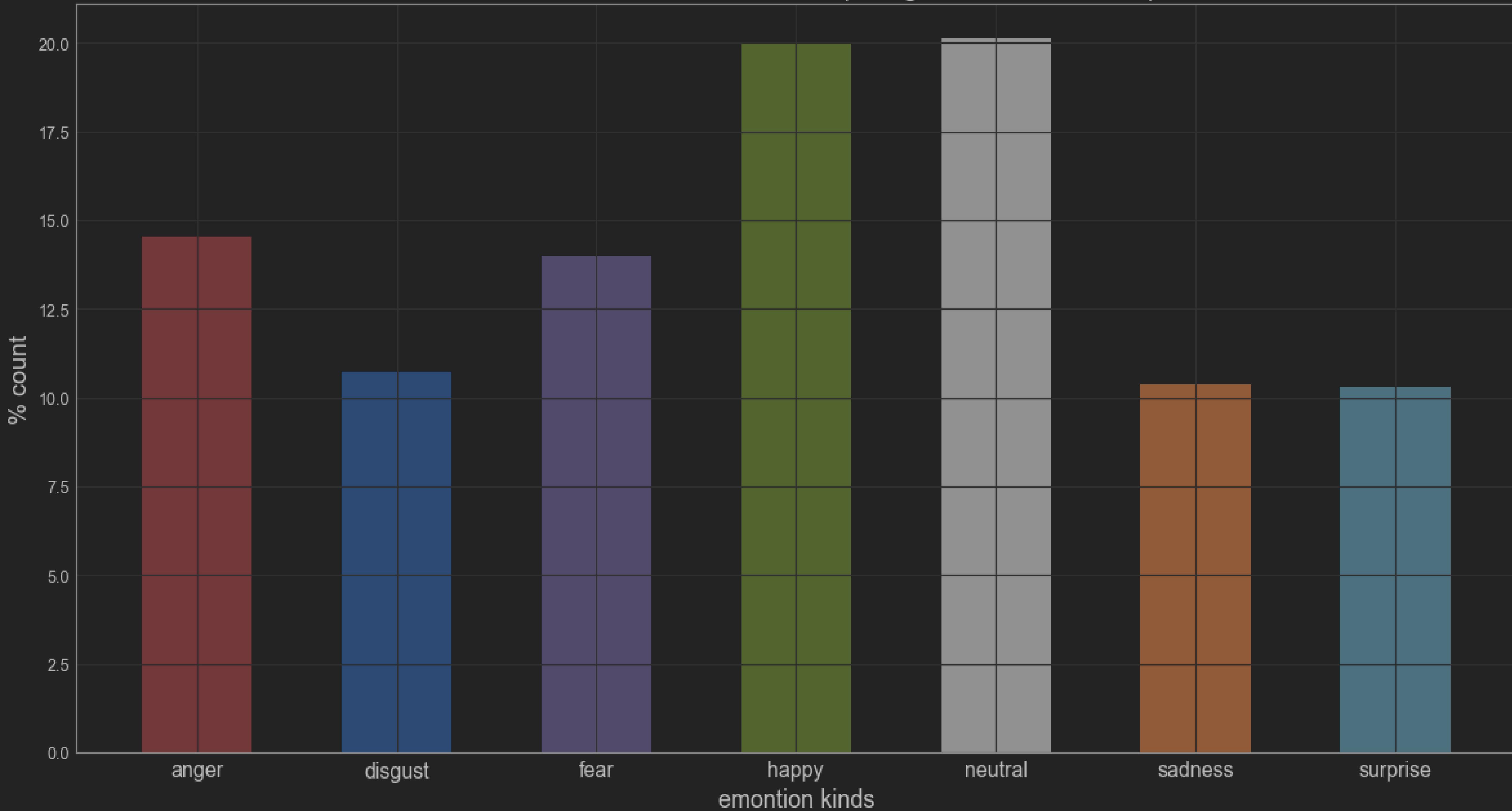
CK+ DataSet emotion distribution ( images number : 1080 )



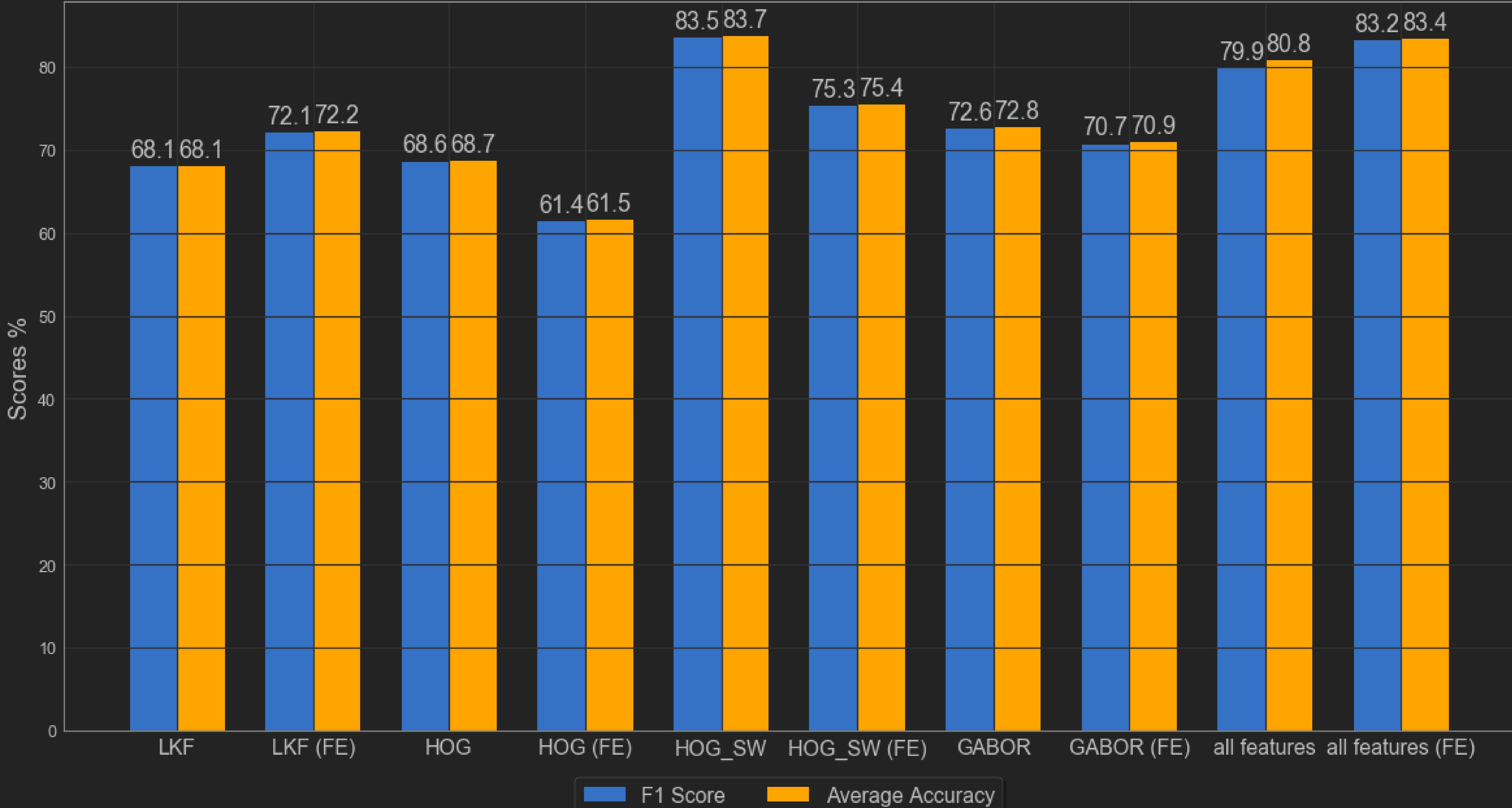
Highest accuracies & F1 scores per features extraction algorithms for CK+ DataSet



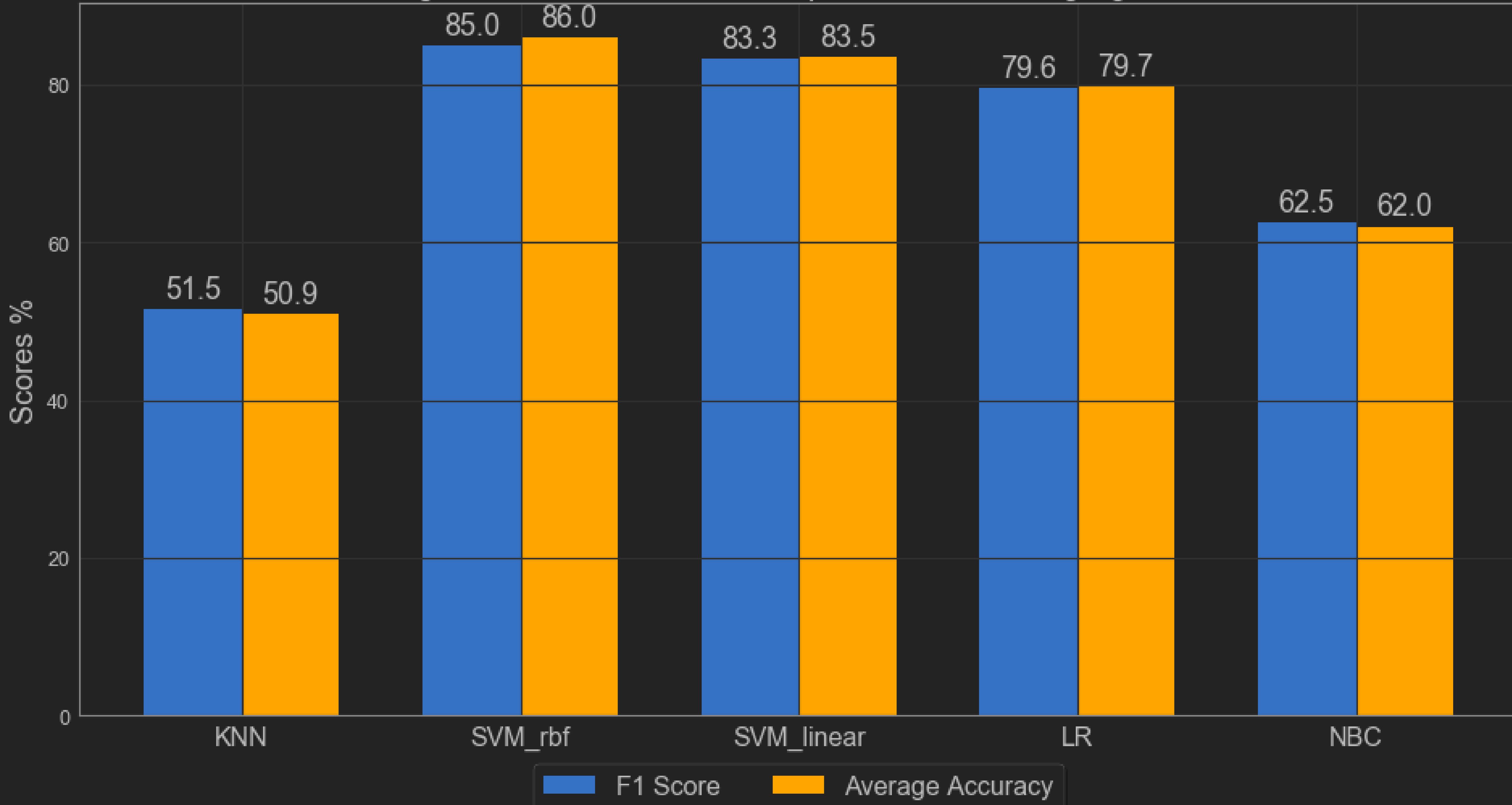
## All DataSet emotion distribution ( images number : 3918 )



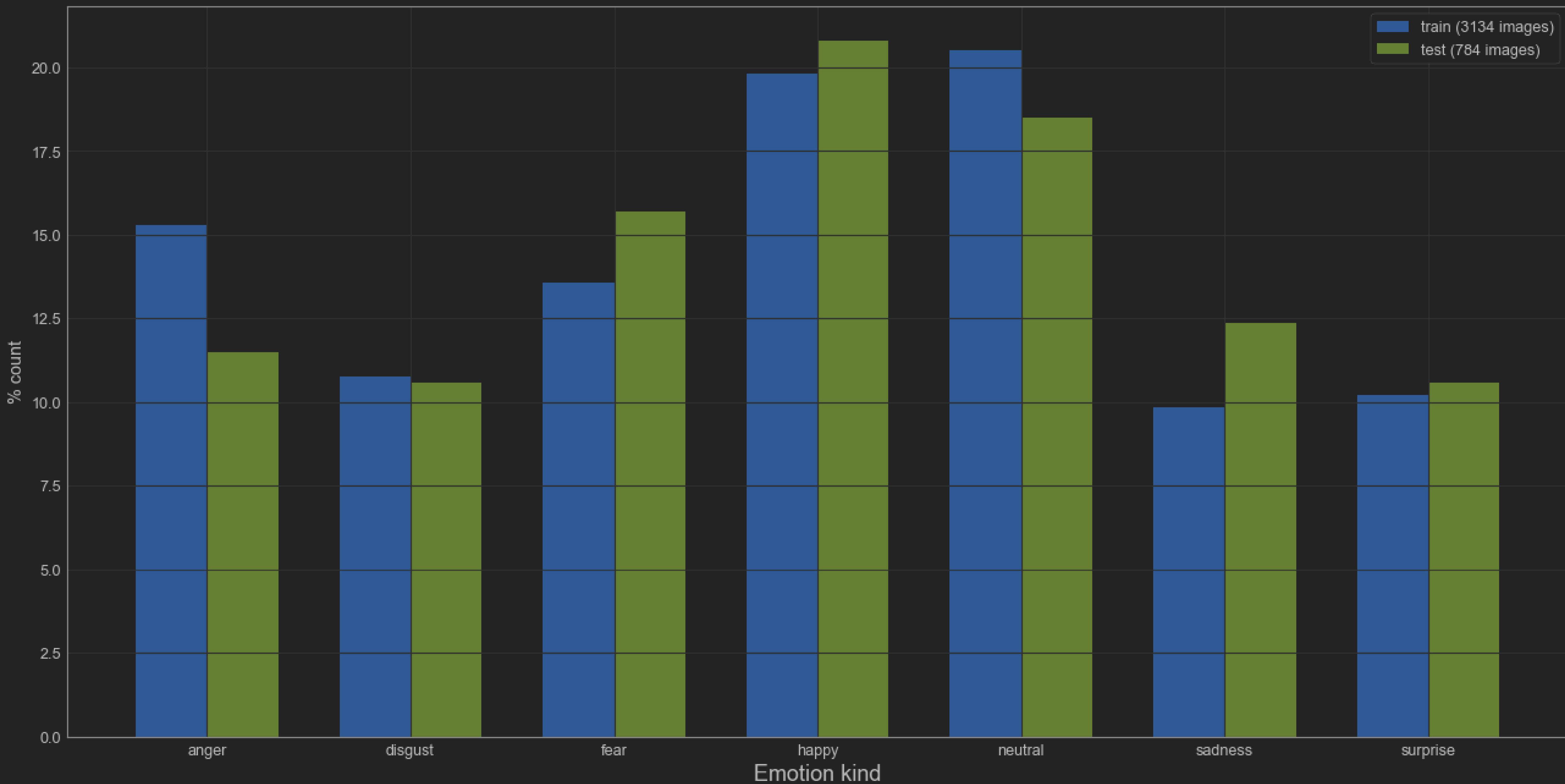
Highest accuracies & F1 scores per features extraction algorithms for ALL DataSet

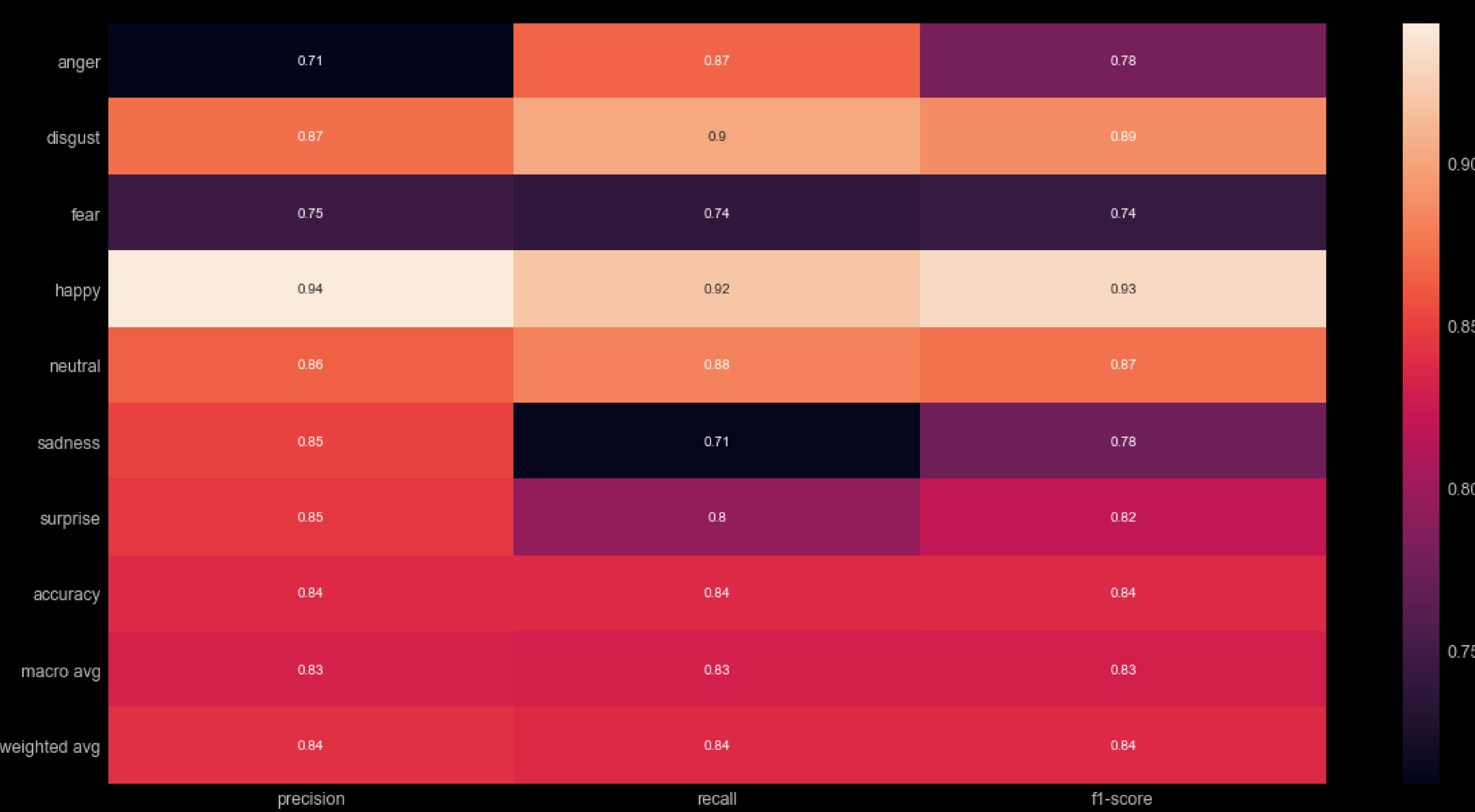


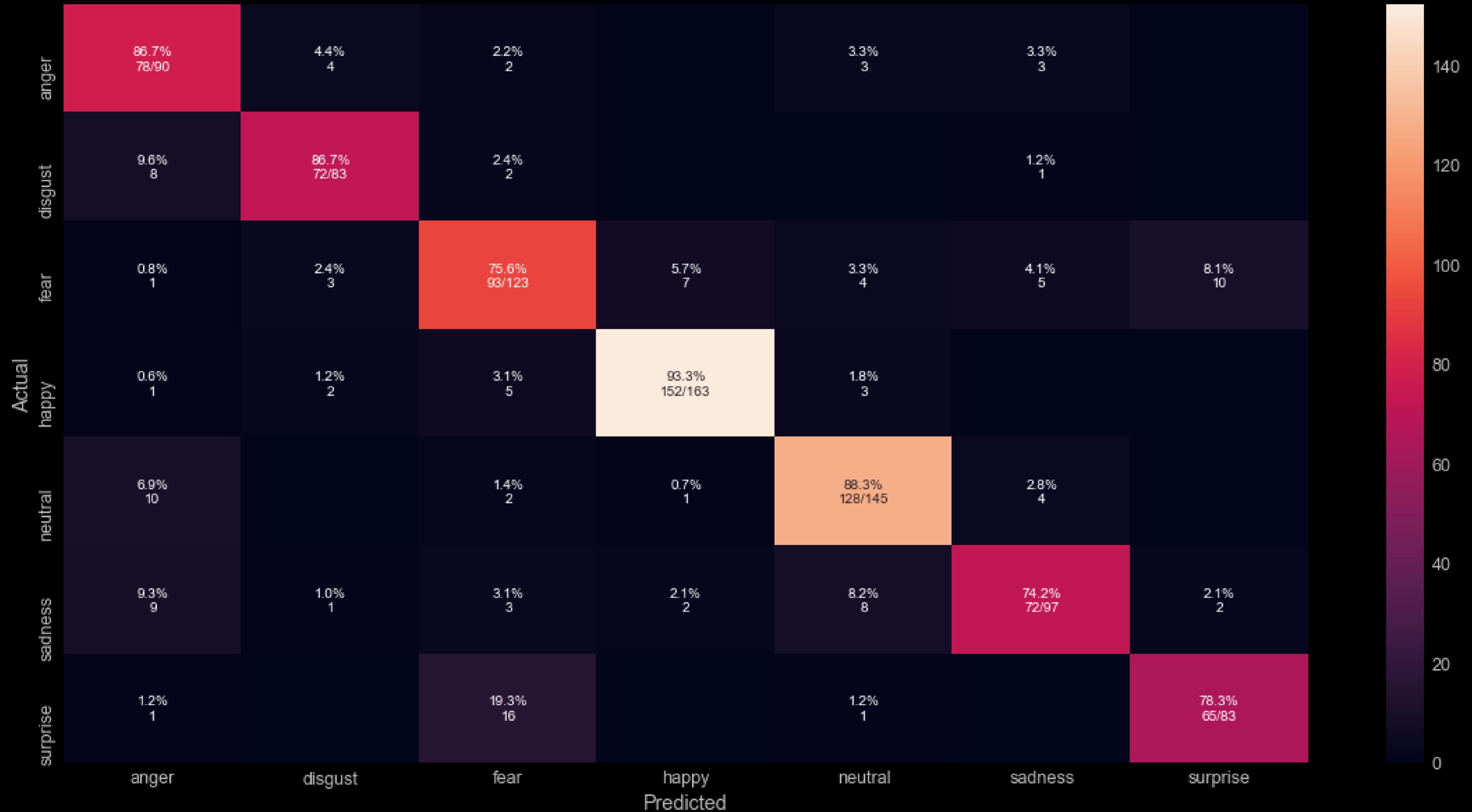
# Highest accuracies & F1 scores per machine learning algorithm



All DataSet emotion distribution ( images number : 3918 )

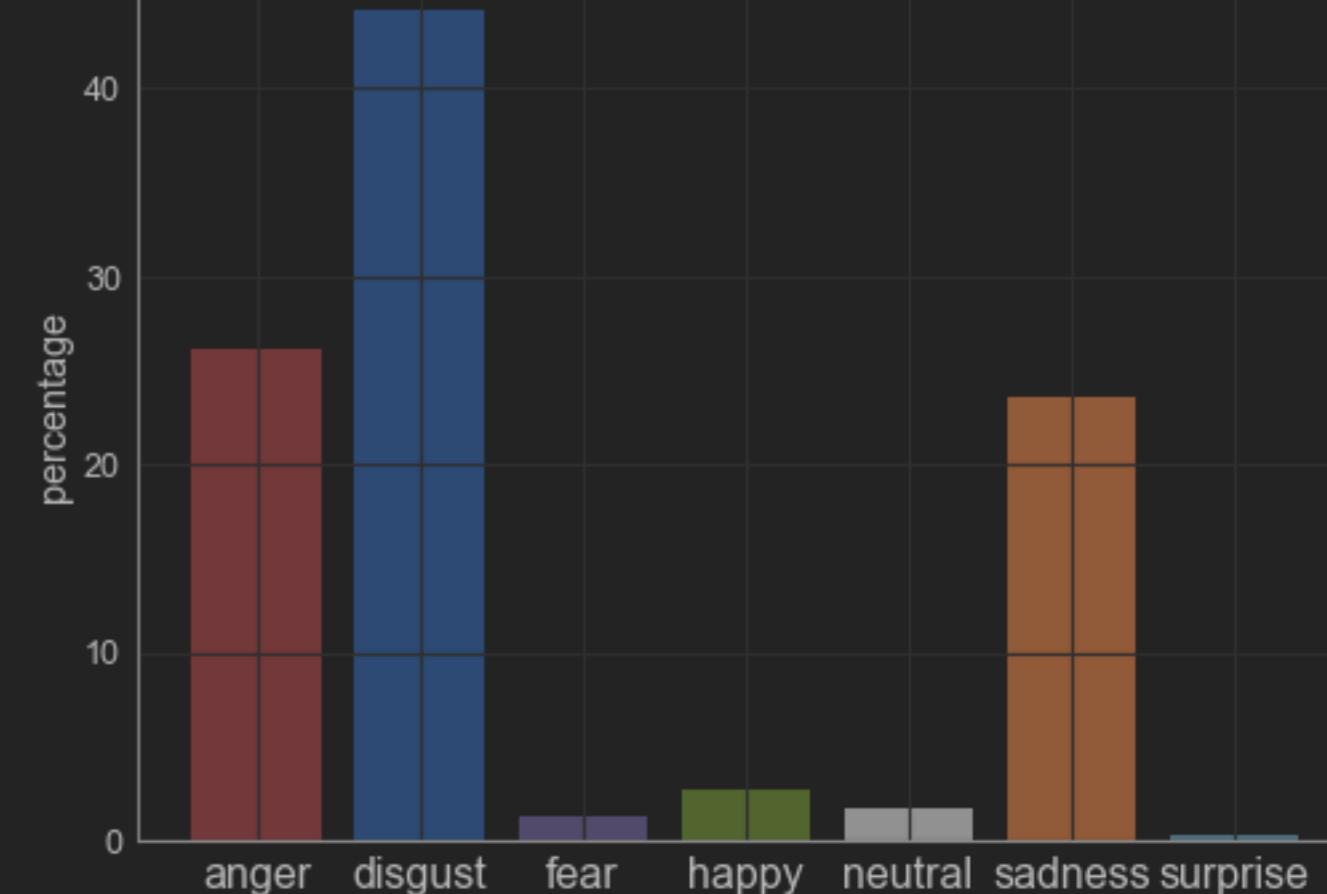
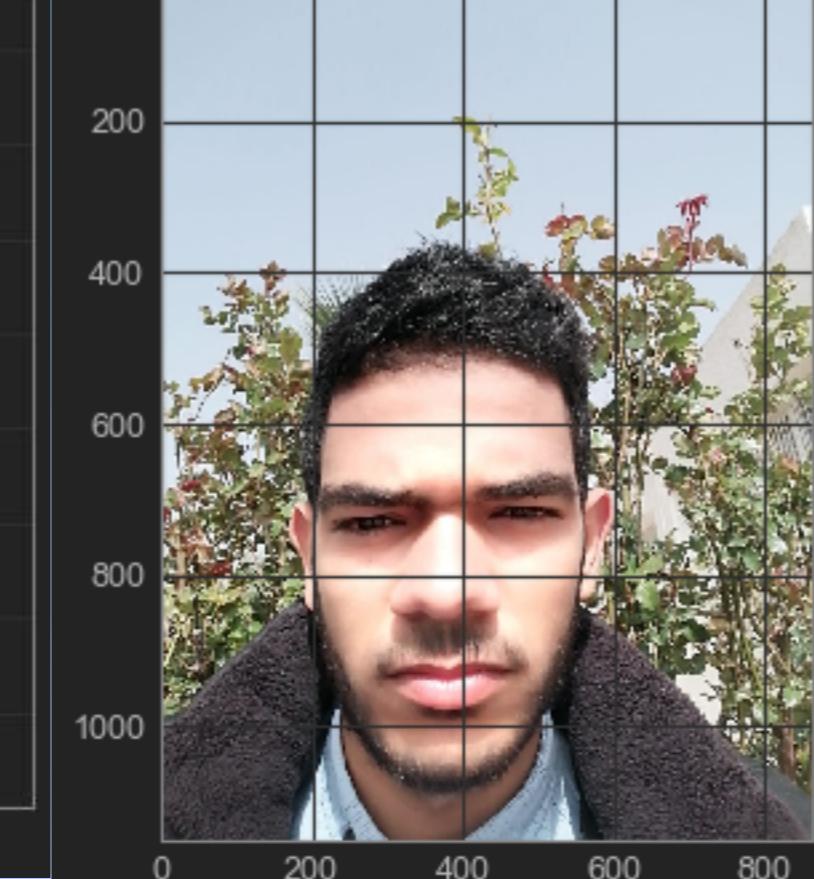
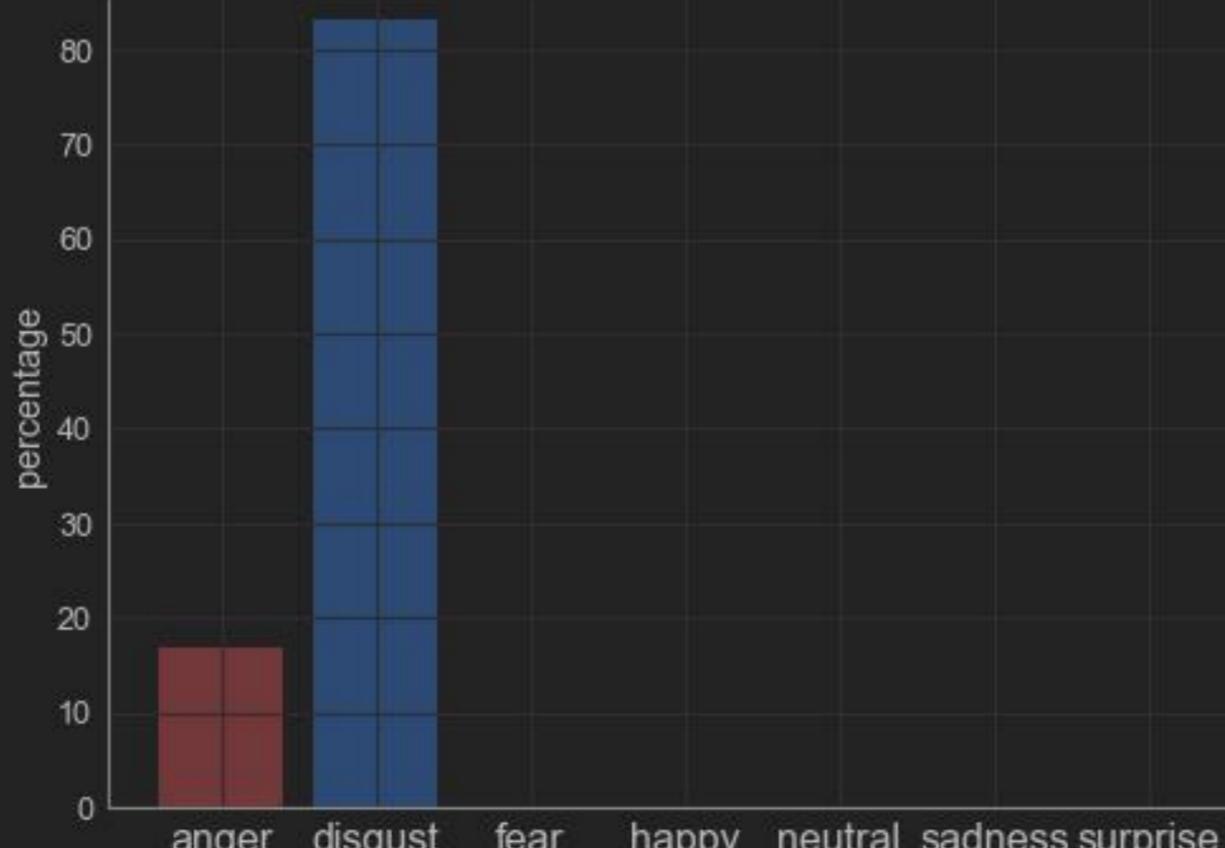
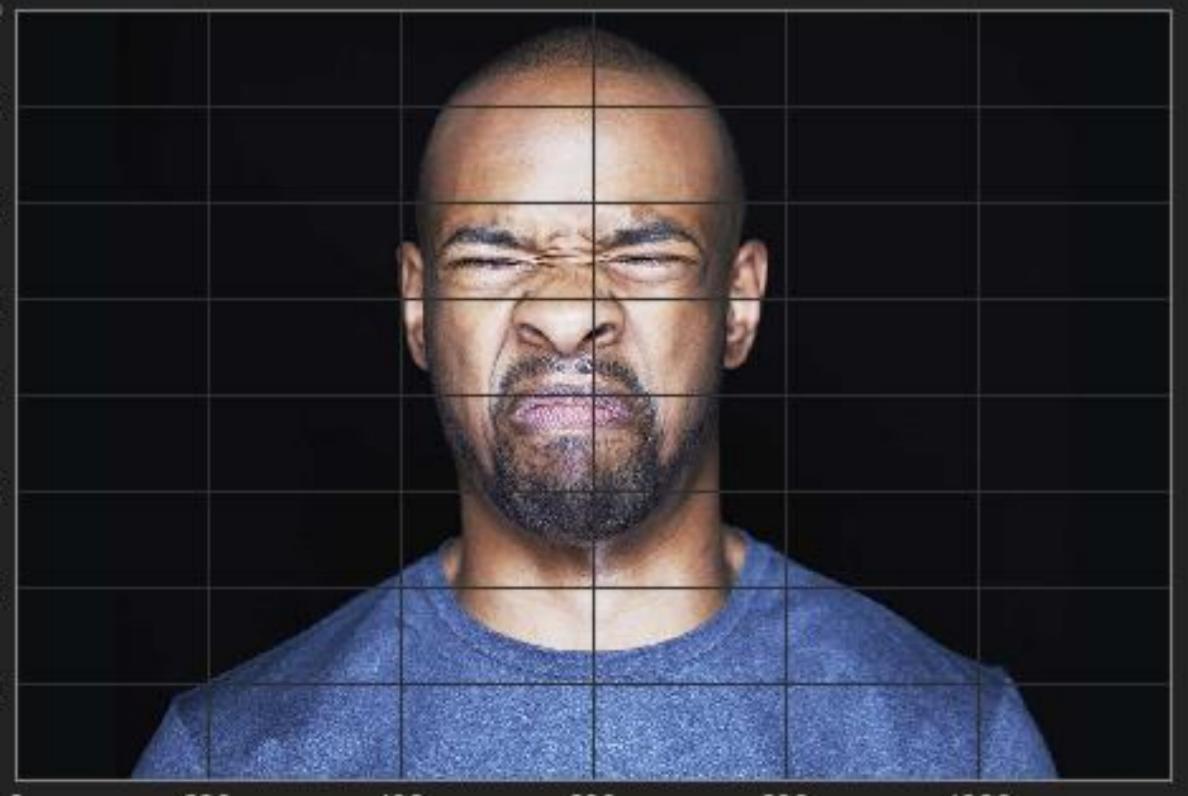
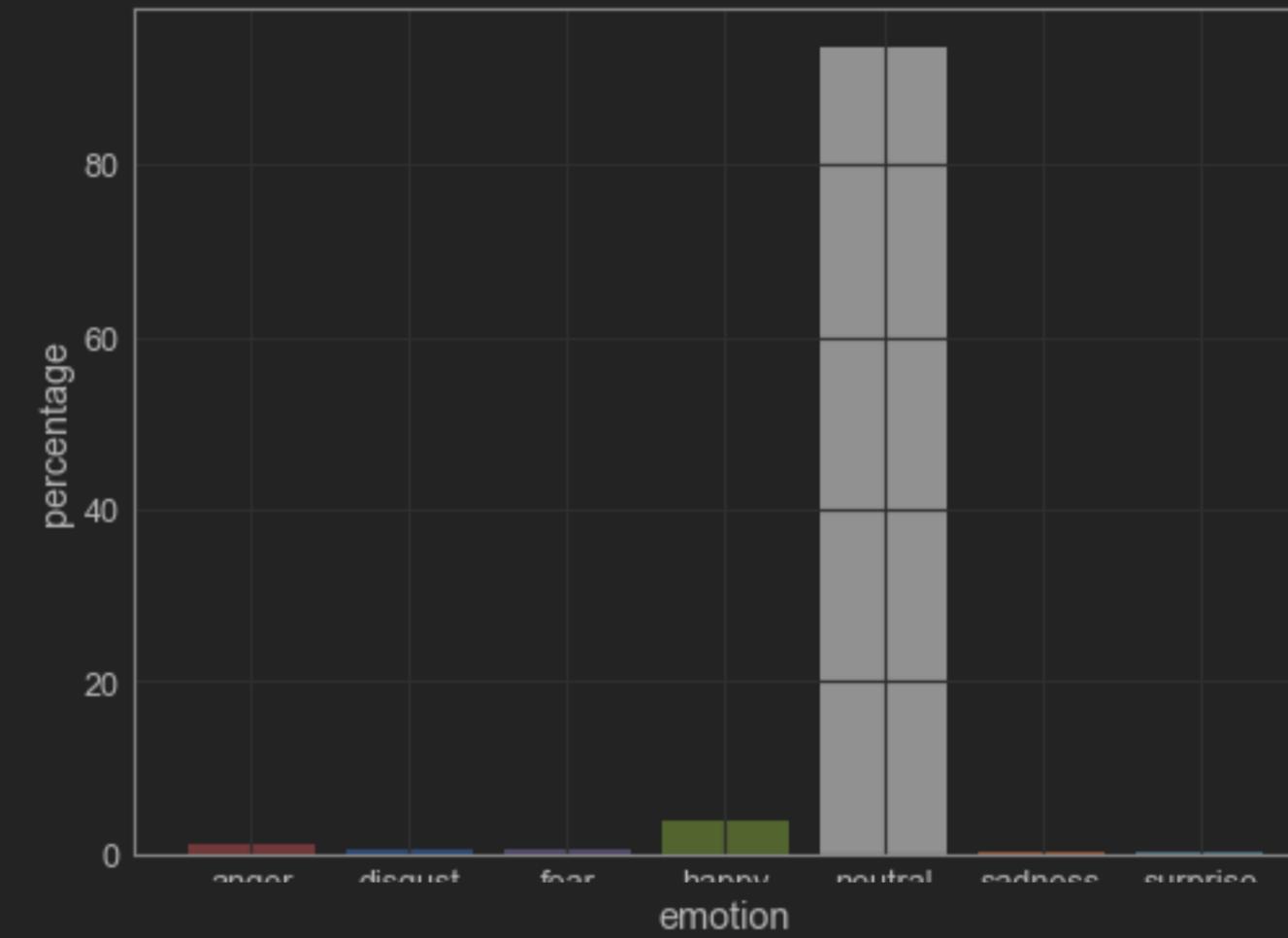
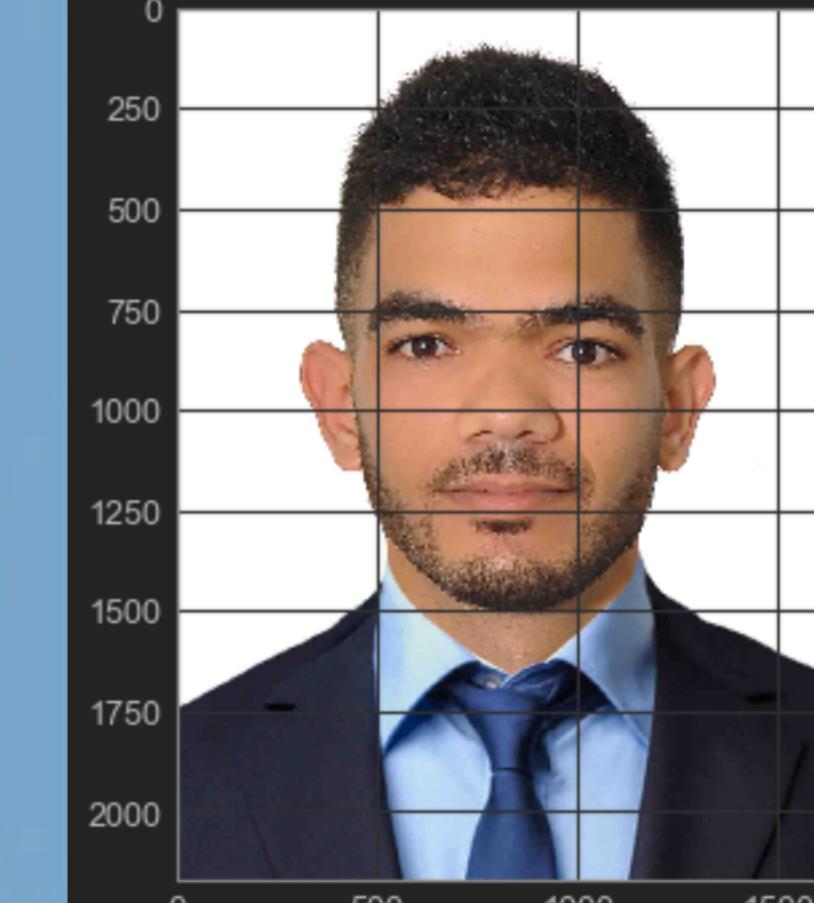
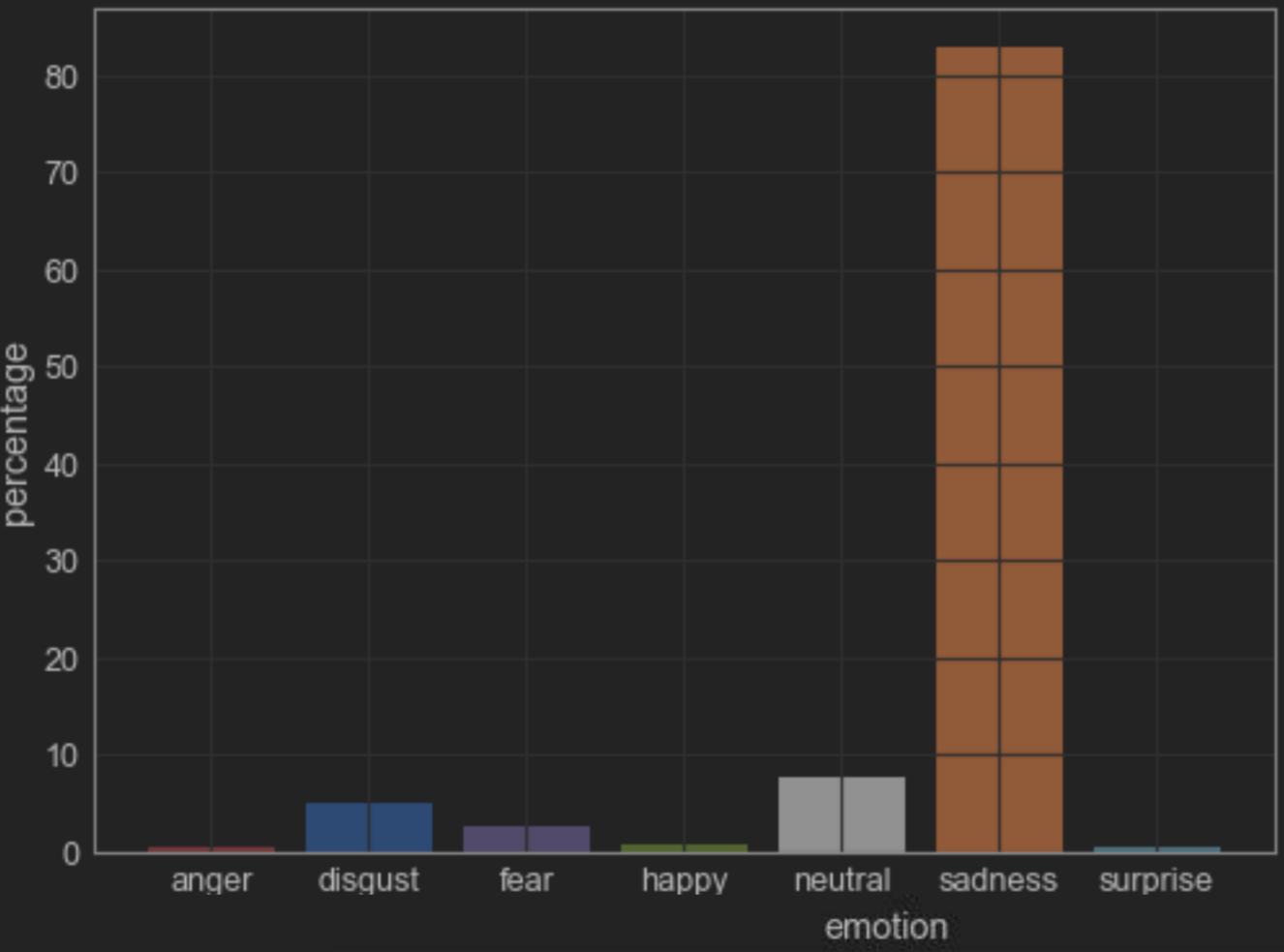
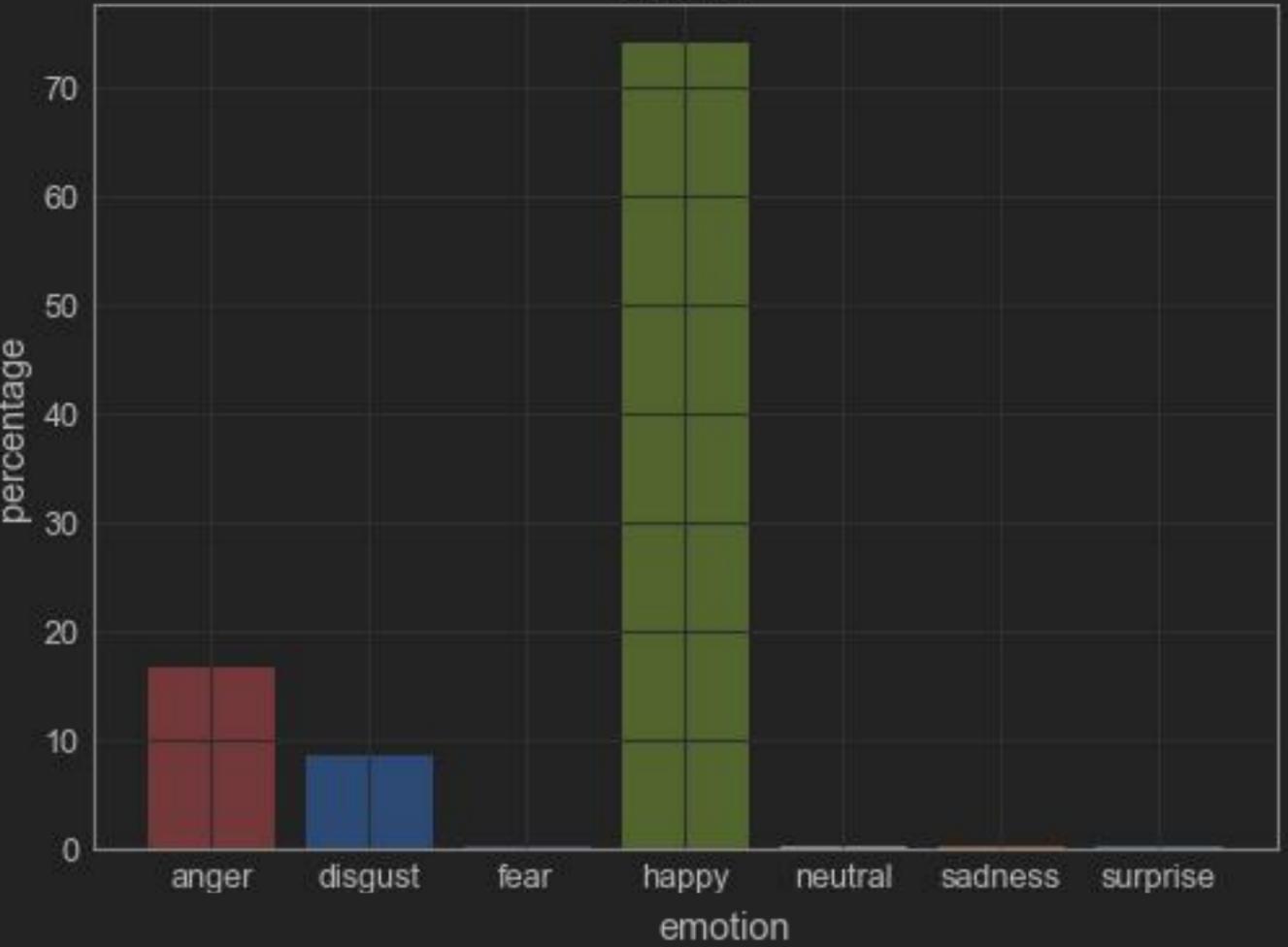
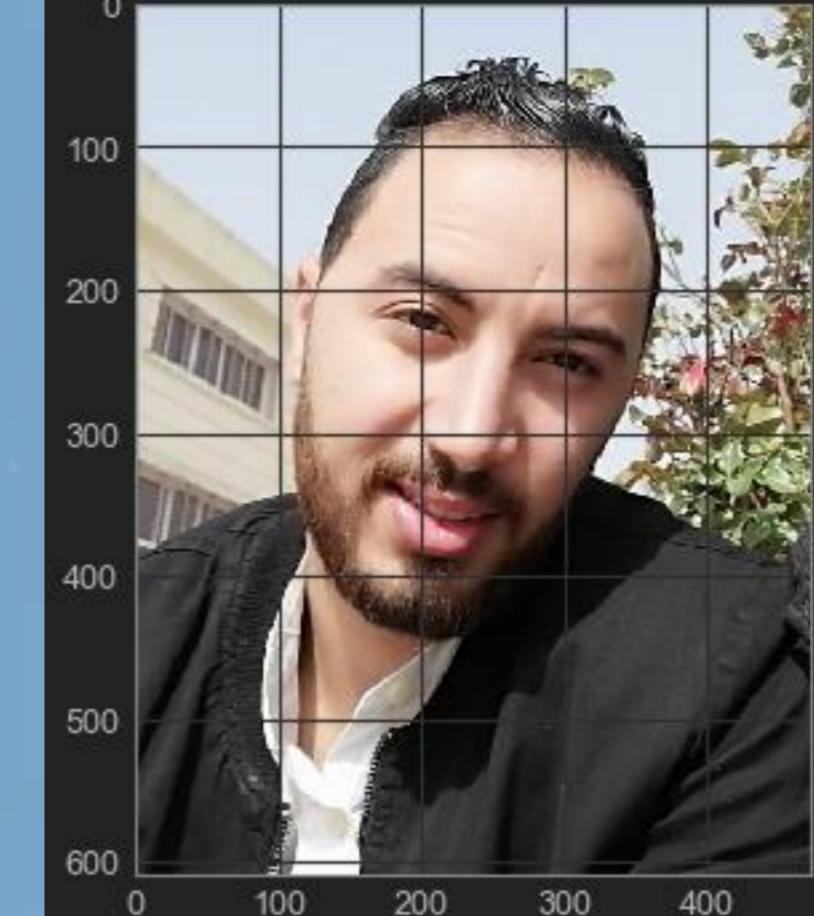
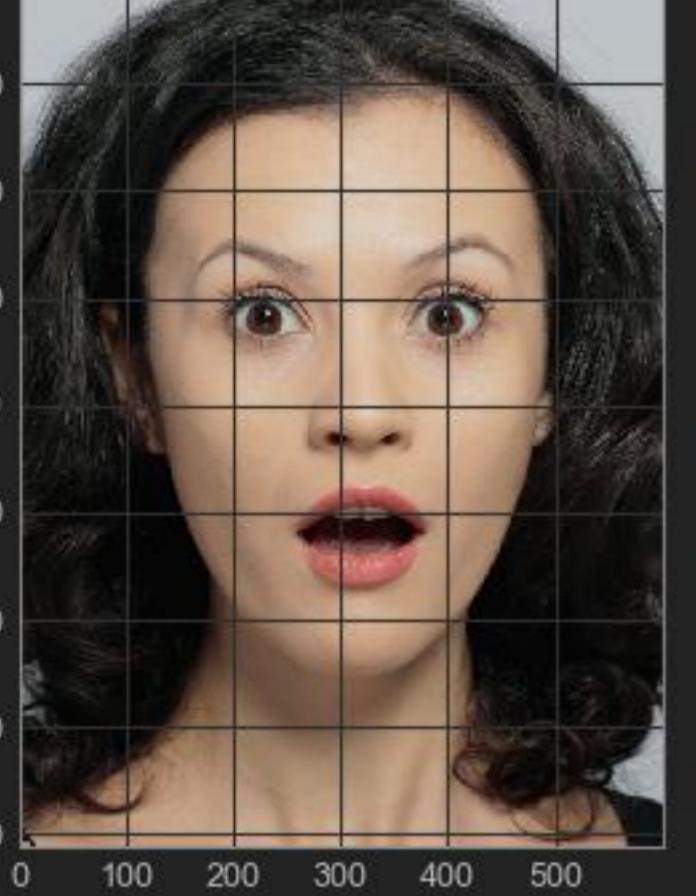






# DEMONSTRATION





# CONCLUSION ET PERSPECTIVES

БЕЗВЕСИДАЕС

СОЗГРАДИДИ





# MERCI DE VOTRE ATTENTION