COMPUTER VISION

EMOTION EXPRESSION BAG OF VISUAL WORD AND DEEP LEARNING

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May, 16th, 2018

Agenda

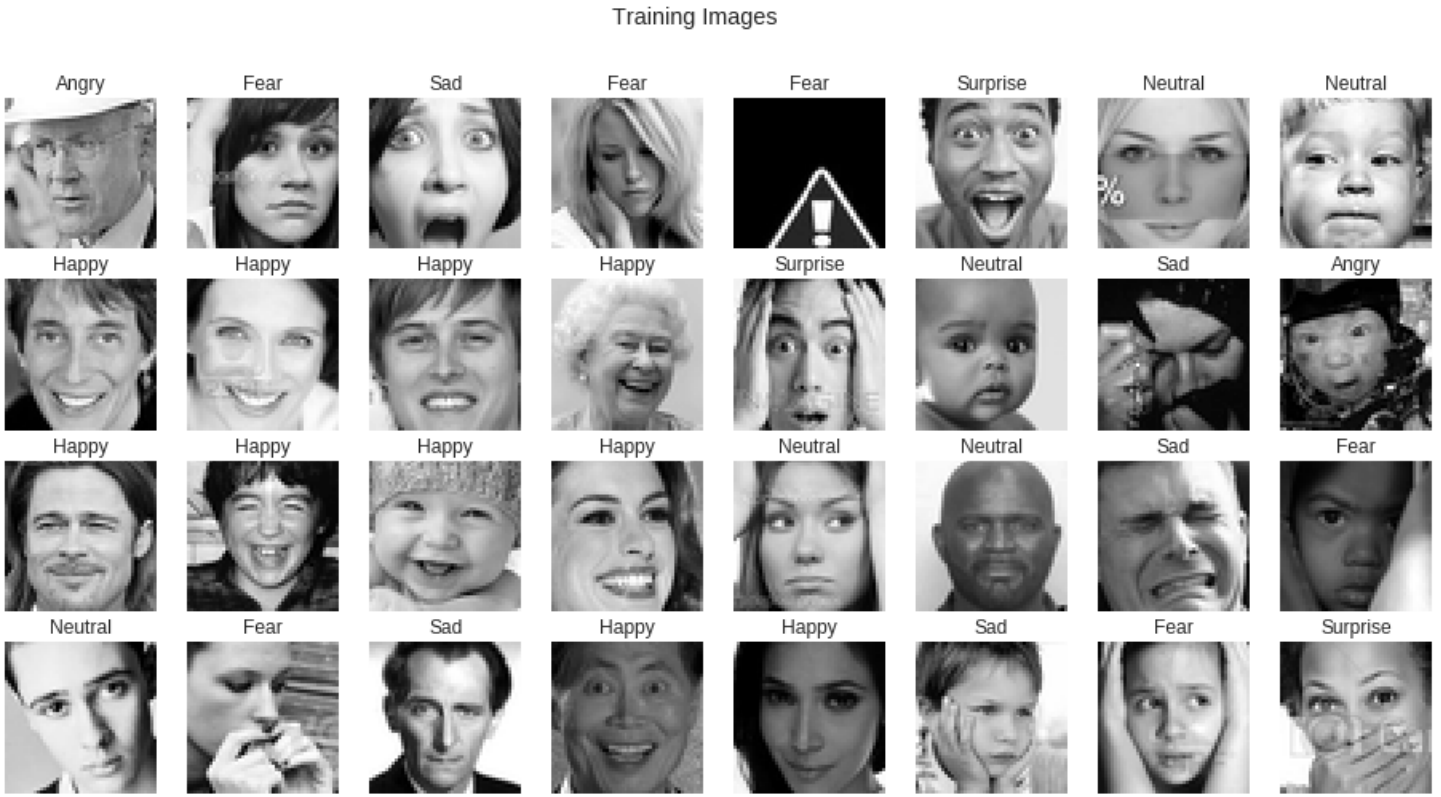
1. Introduction
2. Problem 1: Emotion Bag-of-Word Object
3. Problem 2: Emotion Deep Learning
4. Problem 3: Emotion Video Extraction
5. Future Works: Bag-of-Word using Deep Learning

Demo Program

1. INTRODUCTION

1.1. PROBLEMS

- Emotion Expression Recognition: FER2013



1. INTRODUCTION

1.2. DATASET

1. INTRODUCTION

1.3. DISTRIBUTION DATASET

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Number of images in the training dataset:        28709
Number of images in the validation dataset:       3589
Number of images in the testing dataset:          3589
Image information: 48 x 48 x 1
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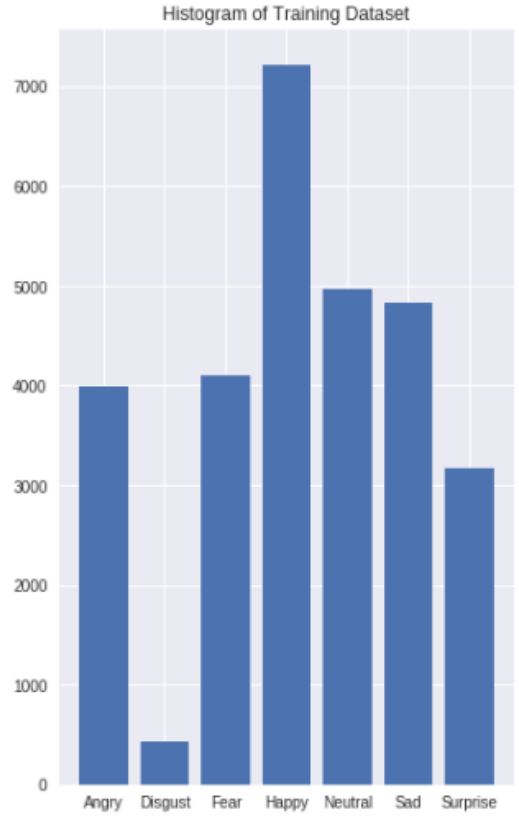
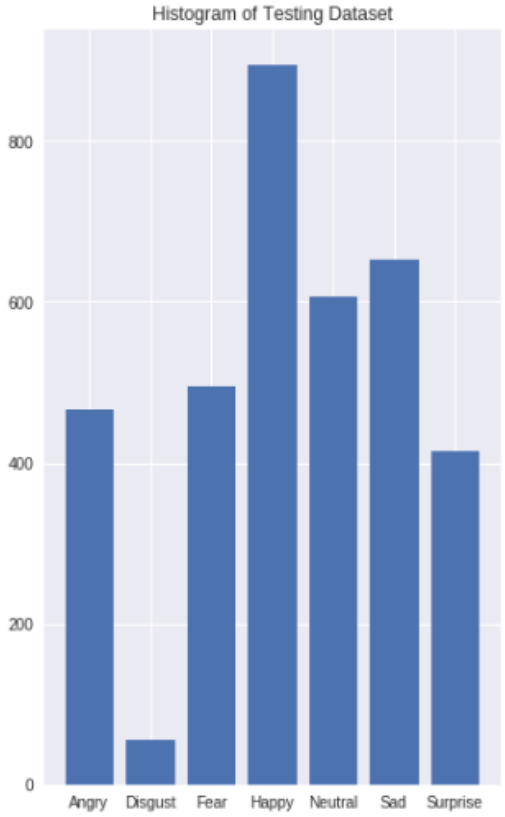
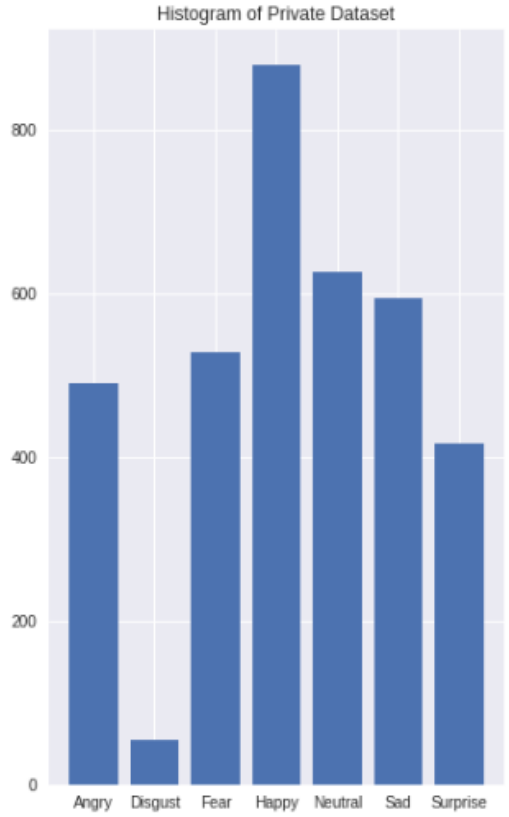






2. Prolem 01: Emotion with Bag-of-Word And Sparse SIFT Featur

2.1. Training Process

- Extract descriptors using SIFT
- Merge descriptors into local patches
- Cluster local patches using Mini Batch K-Means to build codewords
- Build Feature Histogram Model based on codewords
- Normalize Feature Histogram Model
- Classify by Multi-Class SVM

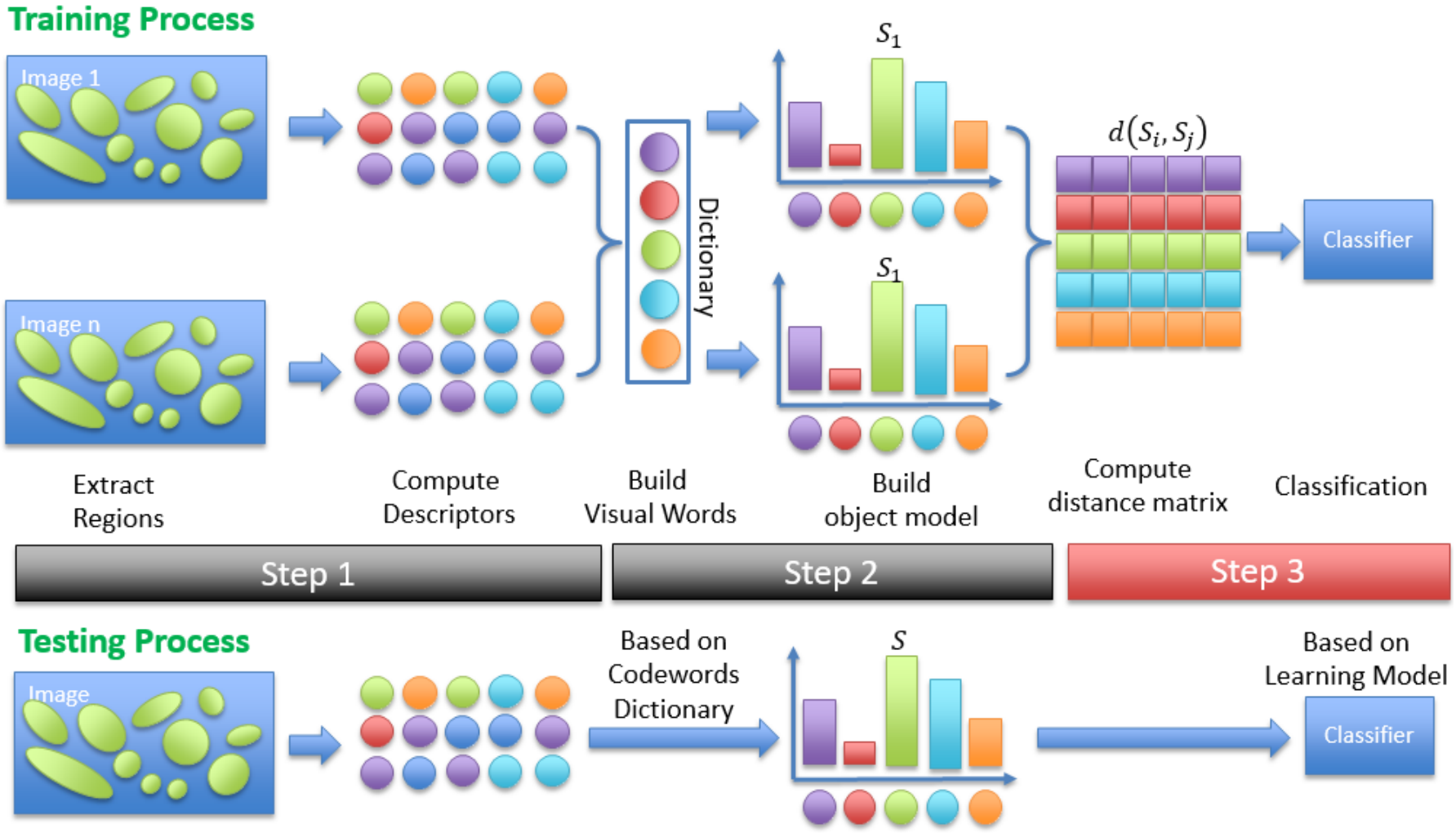
2. Prolem 01: Emotion with Bag-of-Word And Sparse SIFT Featur

2.2. Testing Process:

- Extract descriptors using SIFT
- Match descriptors with K-Means Cluster Center to build codewords for testing image
- Create and normalize Feature Histogram Model for Image Codewords
- Predict by Multi-Class SVM

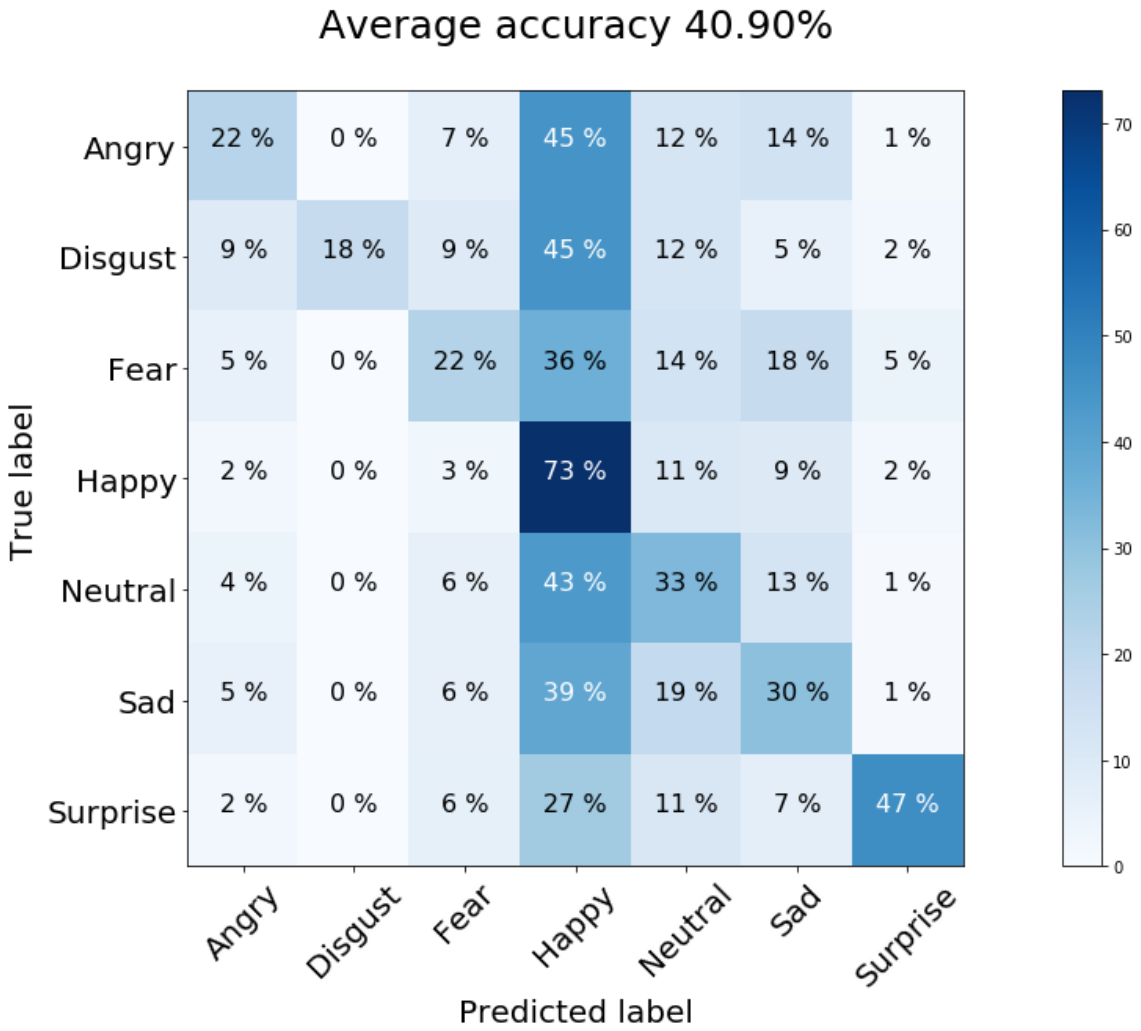
2. Prolem 01: Emotion with Bag-of-Word And Sparse SIFT Featur

2.3. Process:



2. Prolem 01: Emotion with Bag-of-Word And Sparse SIFT Featur

2.4. Results:



3. Prolem 02: Emotion with Deep Learning

3.1. Deep Learning CNN-Like-VGG16 Model:

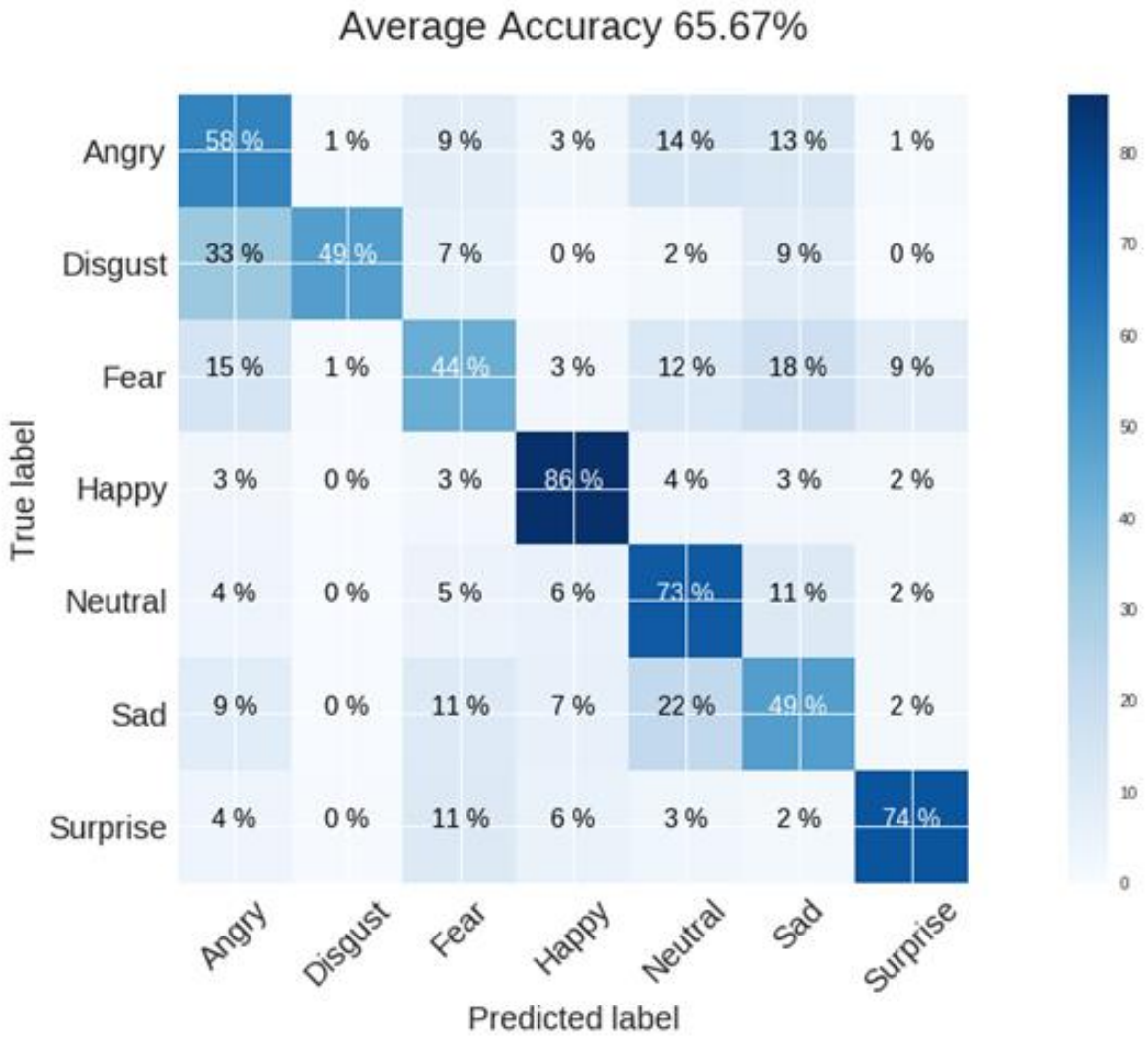
- Block 1 – 3 Conv2D (64, (3,3)), MaxPooling (2,2), Dropout (0.2)
- Block 2 – 4 Conv2D (128, (3,3)), MaxPooling (2,2), Dropout (0.2)
- Block 3 – 4 Conv2D (256, (3,3)), MaxPooling (2,2), Dropout (0.2)
- Classifier – Flattern, Dense (1024), Dropout(0.5), Dense(7, SoftMax)

3. Prolem 02: Emotion with Deep Learning

3.2. Training History

3. Prolem 02: Emotion with Deep Learning

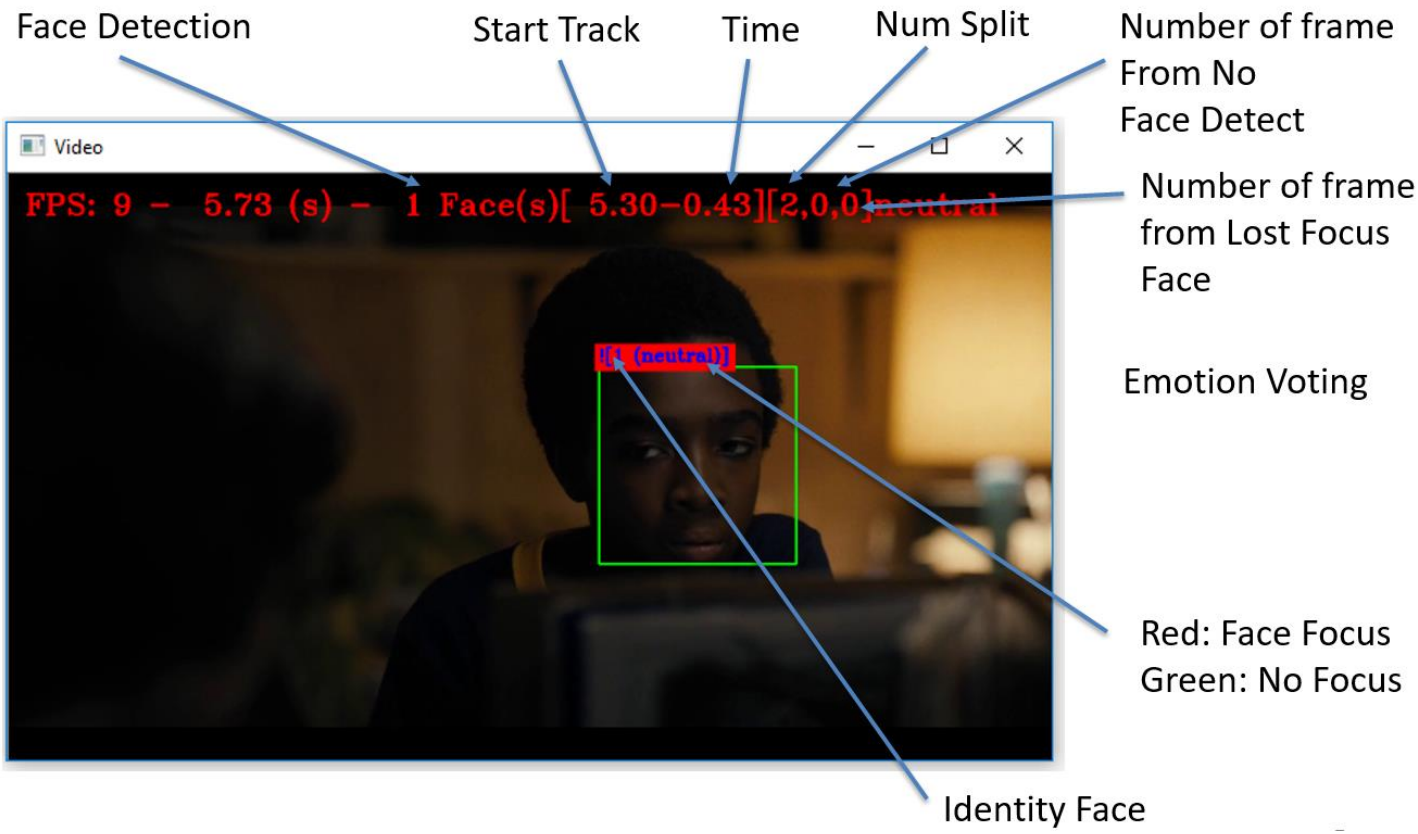
3.3. Results:



4. Prolem 03: Video Emotion Extraction

4.1. Program Description:

- Extract small video clips in a video and vote video emotion of small clips



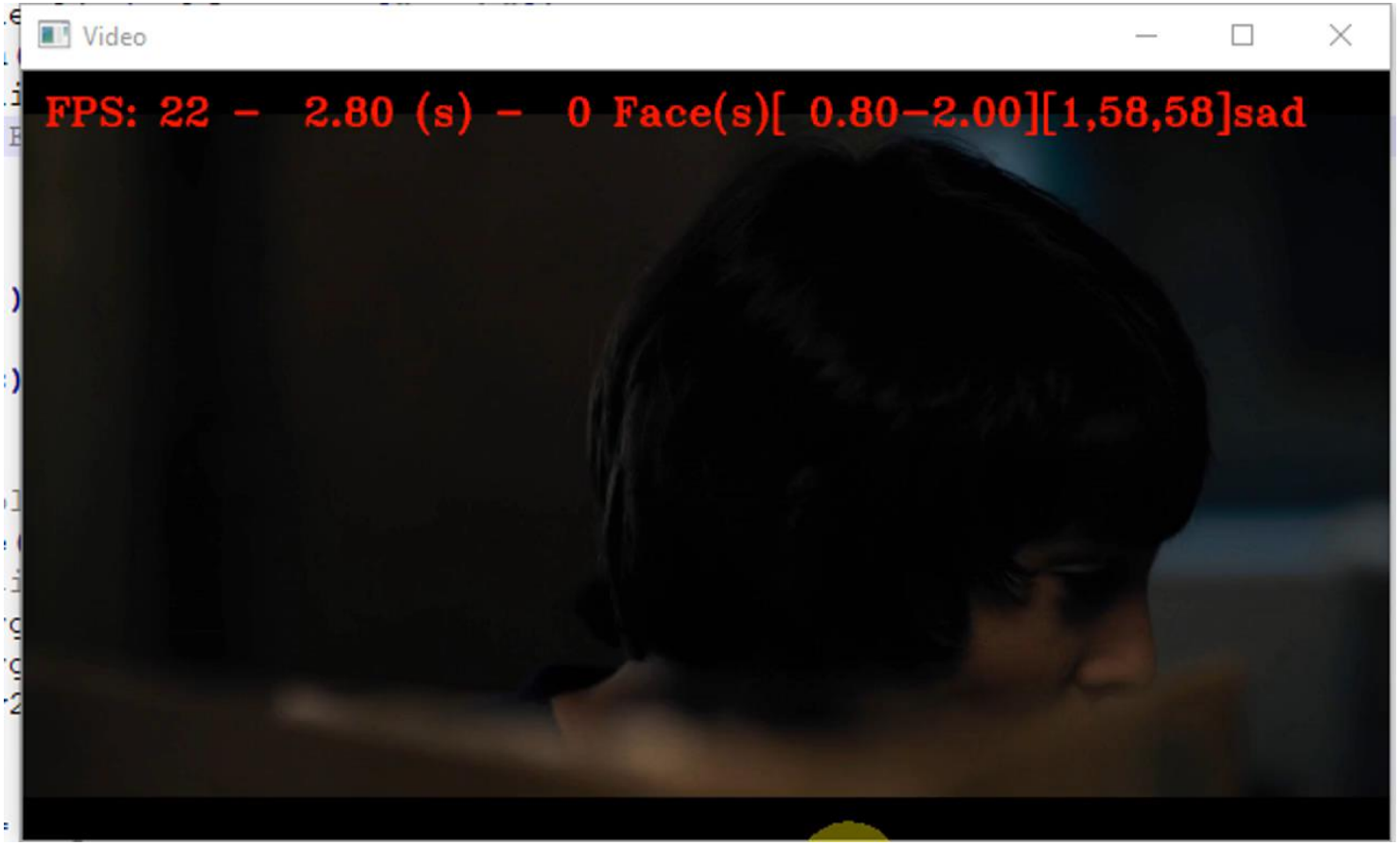
4. Prolem 03: Video Emotion Extraction

4.2. Program Features:

- Console Program with Modules
- Emotion MLCNN,
- Face Detection Dlib, OpenCV, MTCNN,
- Face Matching using Hungarian Method,
- Face Description with VGG Face

4. Prolem 03: Video Emotion Extraction

4.3. Demo:



5. Future Works

Bag-of-Word using Deep Learning

- Use CNN Model for feature extraction (old: SIFT)
- Use RNN for building histogram model (old: K-Means)

THANKS FOR LISTENING!

Waiting for question!