



LCC - № T58.5-58.64

THE DEFINITION OF EMOTIONAL STATE IN REAL TIME

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Abstract. In this work it was determined which emotion is essential for a potentially dangerous person in the service of Emotion the API, with the help of a program LiveCameraSample.

Keywords: Emotion API, neural networks.

Introduction. The need to develop biotechnical systems, monitoring emotional state, to increase the security in public places to prevent terrorist attacks and various crimes.

Objective. The aim of this work is to create a bioengineering system with a small margin of error and a high recognition rate.

Materials and methods. In real life scenario, facial expressions and emotions are nothing but responses to the external and internal events of human being. In human computer interaction, recognition of end user's expressions and emotions from the video streaming plays very important role. In such systems it is required to track the dynamic changes in human face movements quickly in order to deliver the required response system. The one real time application is physical fatigue detection based on facial detection and expressions such as driver fatigue detection in order to prevent the accidents on road. Face expression based physical fatigue analysis or detection is out of scope of this paper, but this paper reveal study on different methods those are presented recently for facial expression and/or emotions recognition using video. This paper presenting the methodologies in terms of feature extraction and classification used in facial expression and/or emotion recognition methods with their comparative study. The comparative study is done based on accuracy, implementation tool, advantages and disadvantages. The outcome of this paper is the current research gap and research challenges those are still open to solve for video based facial detection and recognition systems. The survey on recent methods is appropriately presented throughout this paper by considering future research works. [1]

The main material of the study

In this work, we used an artificial neural network. The experiment was carried out using the program LiveCameraSample (Fig. 1). With Webcams sharing was lifted emotion control 4 people and 4 criminals who once was caught on camera.

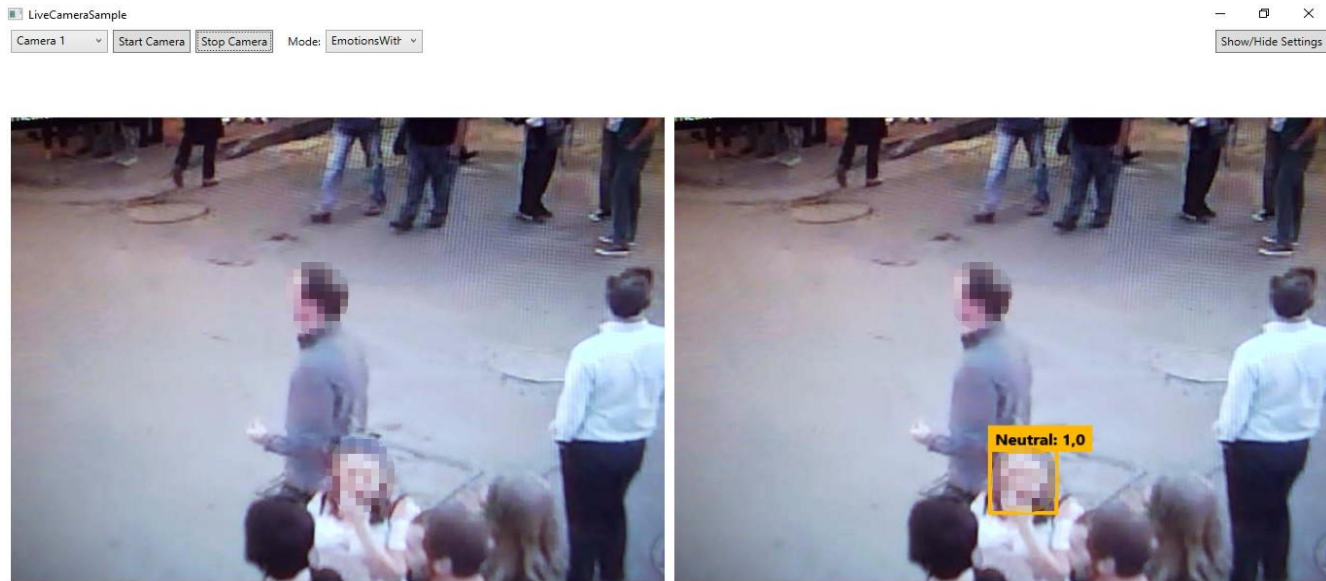


Fig. 1. Neutral emotion is removed from the control of the citizen in the program LiveCameraSample.

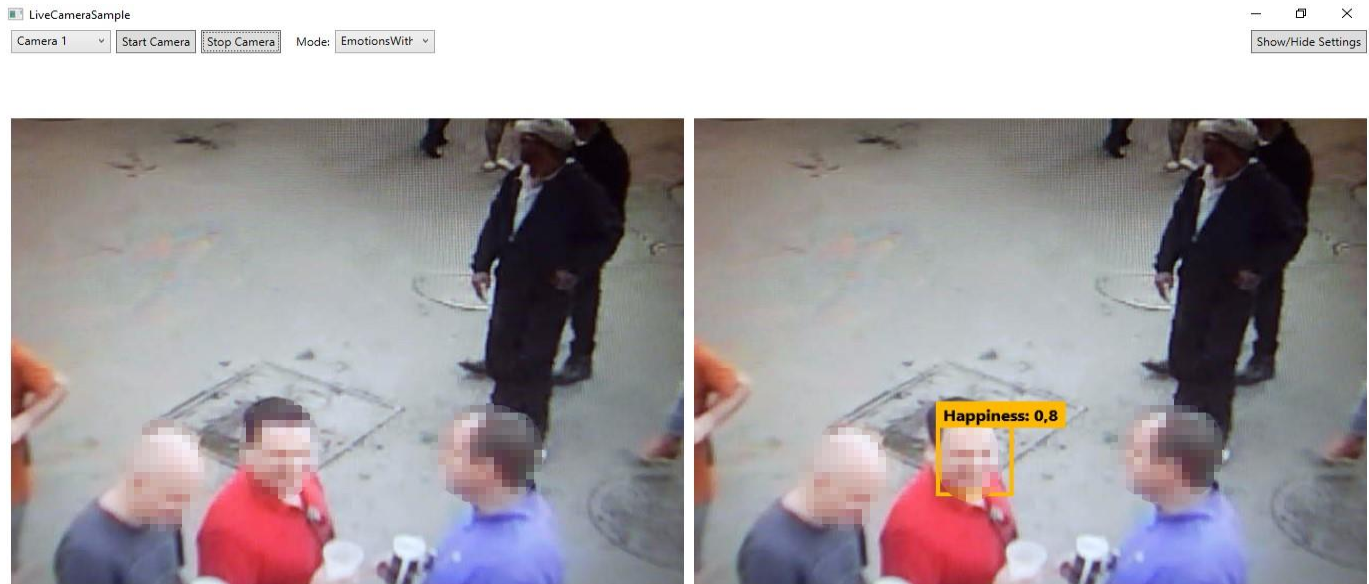


Fig.2. Emotion happiness removed removed from control of the citizen in the program LiveCameraSample.

In this program we see the live video on the left and visualized analysis of the case, I after processing in Cognitive Services, is transferred to him. To begin removing the emotions need to choose a camera, choose the mode (Mode) and press "Start Camera".

In most modes, there was a noticeable delay between live video on the left and visualized analysis. This delay is the time that you need to do to call the API. The exception is the "EmotionsWithClientFaceDetect", which performs face detection locally on the client computer using OpenCV before you can send any image in the Cognitive Services. By doing this, we can immediately visualize the detected face, and then refresh the emotions later, when the API call returns. This demonstrates the possibility of using "hybrid" approach, in which the client can be done some simple processing, and then, when necessary, you can use the advanced API services Cognitive Services.

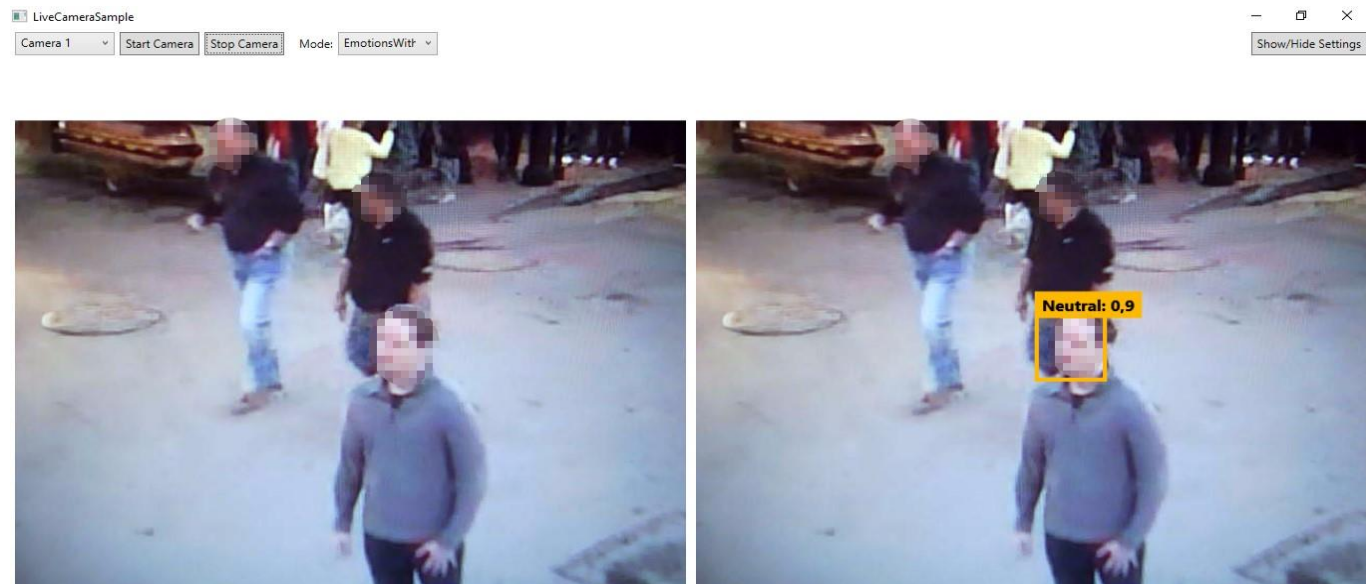
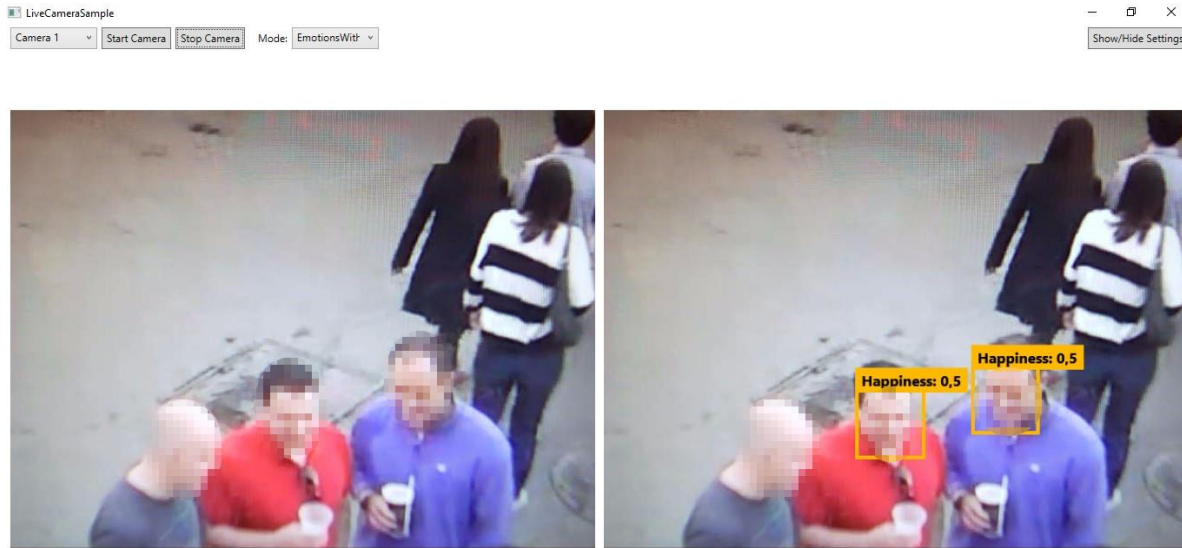


Fig.3. Neutral emotion is removed from the control of the citizen in the program LiveCameraSample.



Emotion API call failed on frame 1104. Exception: Rate limit is exceeded. Try again later.

Fig.4. Emotion happiness filmed with two control citizen in the program LiveCameraSample.

In this sample of people (Fig. 1-4) are citizens, male and female, from 25 to 35 years old, removed from web cameras in New Orleans on Bourbon Street.



Fig.5. Neutral emotion is removed from the offender in the program LiveCameraSample.

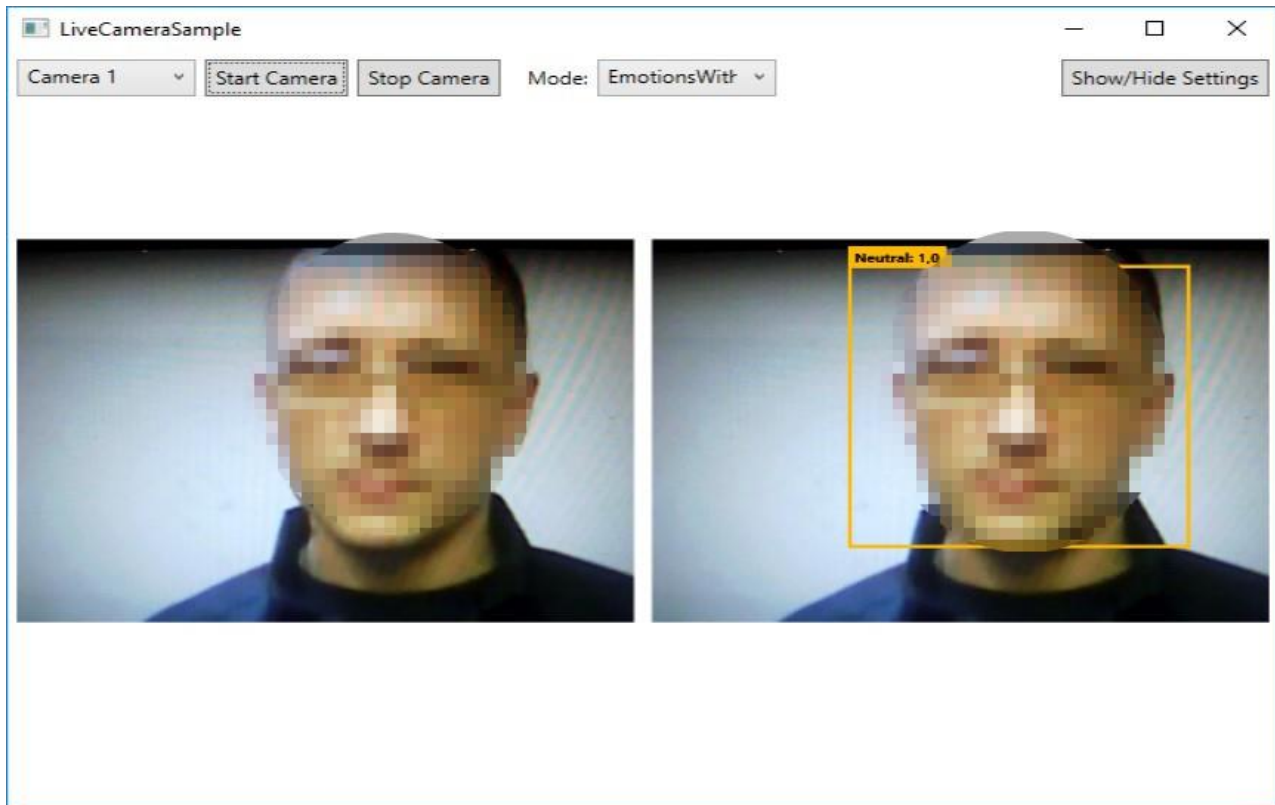


Fig.6. Neutral emotion is removed from the offender in the program LiveCameraSample.

The characteristics of the perpetrators of the crime, recorded in criminal statistics, to determine typical properties and characteristics. Criminological research of personality of the offender enable you to study the personal characteristics of certain categories of criminals. Thus obtained statistical and research material allows to make the following feature.

Among criminals the vast majority of men. The proportion of women ranges from 16%. But the female factor becomes important when committing certain types of crimes. Thus, the proportion of women who commit theft by appropriation, embezzlement or abuse of official position, up to 40% and, conversely, among persons engaged in looting and robberies, not to exceed 6%

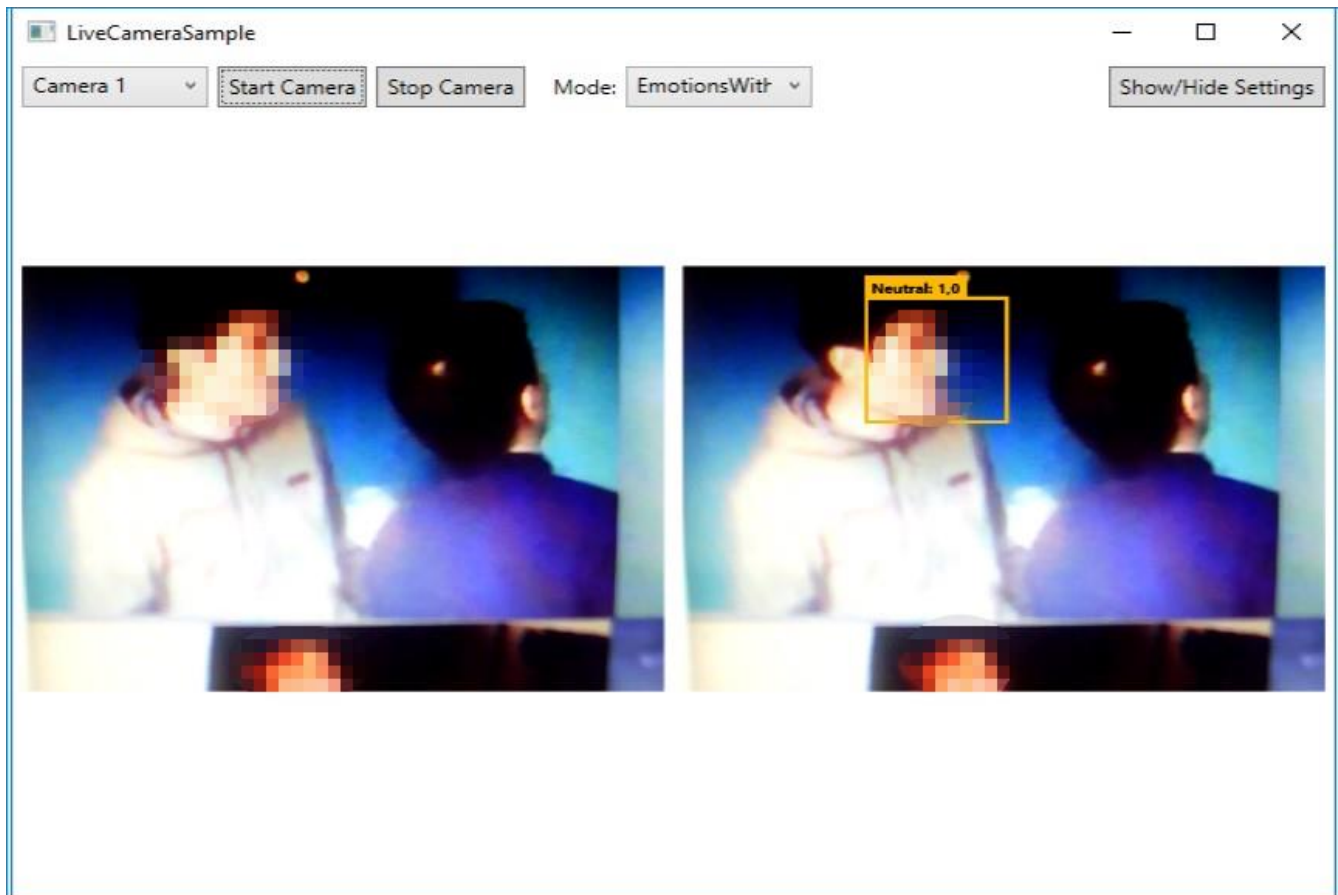


Fig.7. Neutral emotion is removed from the offender in the program LiveCameraSample.

Age differentiation of criminals shows that most crimes are committed at the age of 25 to 29 years (Fig. 5-8), followed by 18-24, 14-17, 30-40-year-old. Less likely to commit crimes of all persons over the age of 50 years. Most criminal activity of criminals under the age of 24 years. The age factor affects the selectivity of criminal behavior. So, at the age of 25 are most often committed theft, theft of motor vehicles, vandalism, rape. After 30 years dominated among those who have committed economic crimes.[3-4]

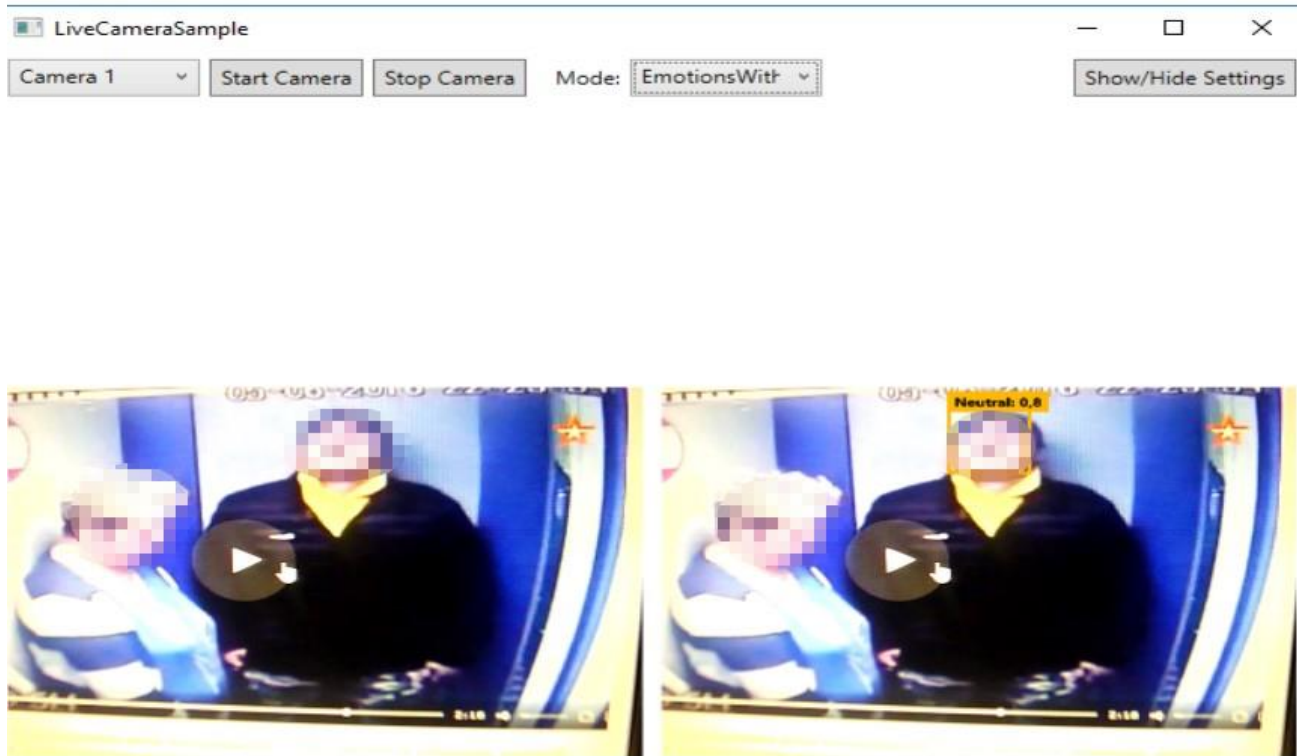


Fig.8. Neutral emotion is removed from the offender in the program LiveCameraSample.

Conclusions. When compared to control citizens and criminals, the control of the citizens behaves as if nothing had happened show different emotions, but the criminals can be assumed not to attract too much attention, often they are neutral emotions.

Almost all criminals, it was observed that the neutral emotion is equal to 1.0.

Conflict of interest statement: The authors state that there are no conflicts of interest regarding the publication of this article.

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