

## **Burnout Recognition for Call Center Agents by Using Skin Color Detection with Hand Poses**

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**Abstract :** Call centers have been expanding and they have influence on activation in various markets increasingly. A call center's work is known as one of the most demanding and stressful jobs. In this paper, we propose the fatigue detection system in order to detect burnout of call center agents in the case of a neck pain and upper back pain. Our proposed system is based on the computer vision technique combined skin color detection with the Viola-Jones object detector. To recognize the gesture of hand poses caused by stress sign, the YCbCr color space is used to detect the skin color region including face and hand poses around the area related to neck ache and upper back pain. A cascade of classifiers by Viola-Jones is used for face recognition to extract from the skin color region. The detection of hand poses is given by the evaluation of neck pain and upper back pain by using skin color detection and face recognition method. The system performance is evaluated using two groups of dataset created in the laboratory to simulate call center environment. Our call center agent burnout detection system has been implemented by using a web camera and has been processed by MATLAB. From the experimental results, our system achieved 96.3% for upper back pain detection and 94.2% for neck pain detection.

**Keywords :** call center agents, fatigue, skin color detection, face recognition

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