Human Activity Recognition System to Benefit Healthcare Field by using HOG and Harris Techniques with K-NN Model

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Abstract

The advancement of technology in recent years led to the development the human activities recognition (HAR) system in video. This type of system is one of an important areas for computer vision (CV). This paper presents a system to help people who are suffered from a health problem and are stayed alone for long times especially the elderly, by recognizing three normal activities: (walking, drinking and eating) and six abnormal activities: (headache, vomiting, fainting, renal colic, intestinal colic, angina), that are chosen from the daily life activities of elderly people. In this paper we proposed iterative thresholding for separating background from foreground and used two various techniques for features extraction Histogram Of Oriented Gradient (HOG) and Harris. Finally, K-Nearest Neighbors (K-NN) is used to classify normal and abnormal activities in video. The alarm system is activated when the system is recognized one of the abnormal activities by sending SMS email to the person who concerned with the status of the patient. The system is evaluated HOG with K-NN against with K-NN whether before and after using linear discriminant analysis (LDA) that is used to select the best features. Average recognition rate of HOG with K-NN before and after using LDA consecutively,
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94.44% and 97.83% and average recognition rate of Harris with K-NN before and after using LDA Consecutively 87.65% and 93.51% for all normal and abnormal activities in our dataset.

References

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Index Terms

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Keywords

Thresholding, HOG, Harris, LDA, K-NN