Vision based Motion Estimation for Human Machine Interaction

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Abstract

Detection and estimation of human body motion is a challenging issue for real-time human-machine interaction. Real-time processing and accuracy are key requirements during the designing of the system. The task of detecting and estimating human motion is a very important aspect for various high-level applications. However, many methods suffer because of not having enough robust estimation and proper motion detection. This paper presents a novel human motion detection algorithm that uses a background subtraction based segmentation based on moving blob regions. Considering the accuracy, here in this system a single video camera is employed without any auxiliary marking tools. This approach first obtains a background image through the acquisition and enhancement of video sequences. Then, it obtains a motion image which is then subtracted from the background image to detect the motion. Pre-processing is then applied to the difference image before the major blob is identified. We then calculate the angle of the motion that was detected by the difference image to evaluate the motion effectively. This measured angle is then sent to the hardware control through wireless transmission. Based on the range of the angle, the room lights and fan speed
is controlled. Multiple experimental results demonstrate the accuracy of this system.

References

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Subtraction and Three Frame Differencing”

**Index Terms**

Computer Science Image Processing

**Keywords**

Motion detection, background subtraction, motion estimation, real-time human-machine interaction.