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**MOTION ESTIMATION AND CLASSIFICATION FOR IMAGE SEQUENCES**

สำนักหอสมุด

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# **MOTION ESTIMATION AND CLASSIFICATION FOR IMAGE SEQUENCES**

A Thesis Presented

by

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## Abstract

In this thesis, a technique for motion estimation and classification of image sequences by using Gradient Structure Tensor (GSTM) and Self-Organizing Feature Map (SOM) is presented. GSTM estimates the motion vectors accurately and robustly while SOM classifies the estimated motion vectors in unsupervised manner. Motion vectors are also labeled according to magnitude and directions with different colors by using SOM. Consequently, the classification of an image sequence is achieved. Based on the combining of GSTM and SOM, motion classification is done for both synthetic and several real image sequences. The simulation results show that the technique is successful.

Moreover, moving object extraction on the surveillance image sequences is also presented. Accumulative Image Sequences (AADI) is tested for extracting the moving object from the stationary background. However, the simulation results show that AADI is not successful enough for every test image sequences. Therefore, new technique for background subtraction is introduced. Background of the surveillance image sequences is generated by applying temporal median filter throughout the image sequences. Moving objects are extracted by subtracting an interested image frame with generated background. Image is again treated with GSTM for estimating the motion within the moving object and SOM for labeling different motions with different colors.

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