Image classification using multiscale information fusion based on saliency driven nonlinear diffusion filtering

ABSTRACT:

In this paper, we propose saliency driven image multiscale nonlinear diffusion filtering. The resulting scale space in general preserves or even enhances semantically important structures such as edges, lines, or flow-like structures in the foreground, and inhibits and smooths clutter in the background. The image is classified using multi scale information fusion based on the original image, the image at the final scale at which the diffusion process converges, and the image at a midscale. Our algorithm emphasizes the foreground features, which are important for image classification. The background image regions, whether considered as contexts of the foreground or noise to the foreground, can be globally handled by fusing information from different scales. Experimental tests of the effectiveness of the multi scale space for the image classification are conducted on the following publicly available datasets: 1) the PASCAL 2005 dataset; 2) the Oxford 102 flowers dataset; and 3) the Oxford 17 flowers dataset, with high classification rates.
EXISTING SYSTEM:

In image classification, it is an important but difficult task to deal with the background information. The background treated as noise; nevertheless, in some cases the background provides a context, which may increase the performance of image classification. Experimentally analyzed the influence of the background on image classification. They demonstrated that although the background may have correlations with the foreground objects, using both the background and foreground features for learning and recognition yields less accurate results than using the foreground features alone. Overall, the background information was not relevant to image classification.

PROPOSED SYSTEM:

We propose to classify images using the saliency driven multi-scale image representation. Images whose foregrounds are clearer than their backgrounds are more likely to be correctly classified at a large scale, and images whose backgrounds are clearer are more likely to be correctly classified at a small scale. So, information from different scales can be used to acquire more accurate image classification results.
ADVANTAGE OF PROPOSED SYSTEM:

- No other work which applies nonlinear diffusion filtering to image classification.
- First, the nonlinear diffusion-based multi scale space can preserve or enhance semantically important image structures at large scales.
- Second, our method can deal with the background information no matter whether it is a context or noise, and then can be adapted to backgrounds which change over time.
- Third, our method can partly handle cases in which the saliency map is incorrect, by including the original image at scale 0 in the set of scaled images used for classification.

HARDWARE REQUIREMENTS:

- System : Pentium IV 2.4 GHz.
- Hard Disk : 40 GB.
- Floppy Drive : 1.44 Mb.
- Mouse : Optical Mouse.
- Ram : 512 Mb.
SOFTWARE REQUIREMENTS:

- Coding Language: ASP.Net with C#
- Data Base: SQL Server 2008.