Report

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Statistical Flow Method: We believe that the temporal information of a video can be represented using the optical flows calculated on the frames. Also instead of working on the entire optical flow of a frame, patches are used to build something called *flow-words.* This way we are able to eliminate redundant patches(ones without motion) and have SIFT like local features. Now, as the number of such patches can be really large, we cluster them and represent each video as a *bag of flow-words.* Finally, we simply train a SVM to learn whether a video is forward or backward.

Data

The data used was carefully downloaded 180 YouTube videos. Also the videos were flipped and time-reversed in order to generate more data.

Algorithm

- We break each video into frames.
- We calculate optical flow by taking three contiguous frames at a time(Image registration is also done to take care of hand motion and camera panning)
- We generate 4x4 patches from optical flow and threshold to remove redundant ones.
- We cluster all such patches in order to generate discretized 4000 flow-words.
- Then each video is represented as a histogram of these flow-words.
- A SVM is trained over these video representations.

Results

Due to lack of computational resources, we were unable to generate our own results in the given time period. However the paper claims it was able to get an average accuracy of around 81% using this method.