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CS4243 Project Proposal

Proposal

This proposal will present an alternative subject for the project of the course '*Computer Vision and Pattern Recognition*'. Because of the different academic backgrounds of the group members, we think another topic might be more manageable and more useful.

The proposed subject is optical image stabilization in video material. Image stabilization is a functionality commonly found in still cameras, but relies on countering the movement of the camera sensor during exposure. The method we propose consists of manipulating the video material after it has been recorded.

Method

The main idea of stabilizing the video data would be cropping a portion of each frame in the video material around a fixed point near the centre of the image.

When the camera is not stationary, the principle of optical flow can be used to compensate for the unintended motion of the camera (the shaking), while keeping account of the intended motion of the camera. Optical flow would be used to estimate the intended motion.

Difficulty

We propose a number of ways to vary the degree of difficulty. The first way of altering could consist of different degrees of motion in the camera, apart from the shaking. Easiest level being the camera aimed at one steady target, medium being the camera moving in a direction perpendicular to the focus plane where it's aimed and hard being the camera moving in directions not strictly perpendicular to the focus plane (panning and rotating).

Another way of varying difficulty could be the subject in the video material. An easy subject could be a road with horizon, harder could be an environment with more texture. At this point in time it will be hard to state what level we will attempt.