Project Title:

To test whether implementing the video interface (Real time) for the modified offset aperture camera is possible or not.

Theory:

The camera works on the principle that the IR image and the RGB image are shifted or there is disparity in the two images based on the object distance. Using this disparity we can calculate the object distance from the camera henceforth creating a depth map of the image.

Preprocessing steps such as Leakage Compensation, Noise reduction and Edge detection are done on the image. Core processing steps include Gradient Extraction and Integer disparity estimation. We obtain the depth map after post processing the image including steps like Cost Aggregation and Fractional disparity estimation.

Work Done till Now:

The OA aperture camera has been implemented using the OAIP software. The camera is capable of sensing the image from the modified Bayer Sensor and storing it in .raw file format.

Technique:

A video is basically a sequence of images running at a certain speed greater than what human eye’s persistence of vision is, so that the sequence of images can be perceived as a motion. This is the basic technique for obtaining a video interface.

Results:

After running some tests and modifying the existing code I came to know that the time taken by the camera to directly capture the image from the sensor was 22 millisecond (best case). Corresponding to this time, we can theoretically devise that we can obtain a maximum 44 fps with this setup.

Enabling the multi frame capture feature and then measuring the fps by changing various parameters like exposure time, analog gain of the image, noise reduction technique etc. I came to know that the maximum fps that was obtained came out to be 8 fps. Hence this setup cannot be used to capture real time video.

Explanation:

One of the main reason why the existing system failed could be that the OAIP software has to save image immediately after capturing it. Hence the number of images it actually captures in a unit time reduces to such a low value. Moreover the parameter, exposure time and the various processing steps affect the fps. Reducing the exposure time increases the fps.