# FINAL PROJECT PROPOSAL

CUDA IMPLEMENTATION OF DISPARITY MAP COMPUTATION
USING BLOCK MATCHING AND SUM OF HAMMING DISTANCES

-RUTVIJ GIRISH KARKHANIS
-AKSHAY HODIGERE ARUNKUMAR

In the project 'CUDA Implementation of Disparity Map Computation using Block Matching and Sum of Hamming Distances', we propose to formulate an algorithm to compute disparity map of stereoscopic images by using the concept of block matching and adding the feature of varying threshold of match based on the features in the image and subsequent matching process. We intend to prototype the code in MATLAB, and then write C code for CPU and GPU (CUDA) Computation. We intend to modify an algorithm written in MATLAB by Siddhant Ahuja[1] and implement it on CPU and GPU code (CUDA) using C programming.

Stereoscopic images are the images taken from a stereoscopic camera, which has multiple image sensors parallel to each other in the direction of object of concern. A stereoscopic image set is as follows.
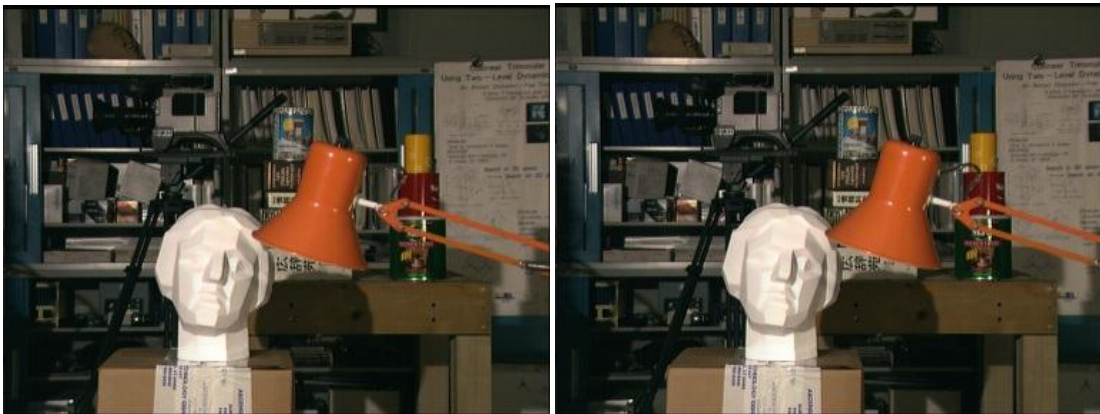
Stereoscopic Image Set [2][3]

We intend to use various sets of such images of resolution 288x384, and obtain outputs for both algorithms run on MATLAB, CPU (C Code), and Nvidia GPU (CUDA Code), and compare performance in terms of output images and timing performance on each of the platforms.

REFERENCES

[1] https://siddhantahuja.wordpress.com/tag/matlab-code/

[2] http://vision.middlebury.edu/stereo/data/scenes2005/

[3] http://vision.middlebury.edu/stereo/data/scenes2001/

[4] http://www.ravenousbirds.com/eolson/papers/stereovision/stereovisionpaper.pdf

[5] D. Scharstein and R. Szeliski. A taxonomy and evaluation of dense two-frame stereo correspondence algorithms.International Journal of Computer Vision, 47(1/2/3):7-42, April-June 2002.

[6] D. Scharstein and C. Pal. Learning conditional random fields for stereo. In IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2007), Minneapolis, MN, June 2007.

[7] http://docs.nvidia.com/cuda/cuda-c-programming-guide/#abstract