Visvesvaraya Technological University
Belgaum

A

Project Report

On

Real Time Distance Estimation using GPU

Submitted in partial fulfillment for the award of the Bachelor of Engineering degree

In

Computer Science and Engineering

VIII Semester, **10CS85 – Project Work**

For the academic year 2013 – 2014

By

Azhar Liaquat	**1HK05CS014**
Suhaib Javid	**1HK10CS073**
Vinit Kumar Bansal	**1HK10CS079**

Under the guidance of

Dr. Waseem Ahmed, CSE Dept

HKBK COLLEGE *of* ENGINEERING

Nagawara, Bangalore – 560 045

Email: info@hkbkeducation.org

URL:www.hkbkeducation.org

ABSTRACT:

For automobiles operated by physically challenged people, a system that assists them in collision detection and avoidance is essential. One of the components of such a system is distance estimation of objects in the front of the automobile. Although distance sensors can be utilized for accurately finding the distance of objects, many such sensors will be needed for a real world operation considering the height and width of the automobile. Another more effective way to achieve this would be to use computer vision to estimate the distance of objects in the scene. However, the computations involved in achieving the result consume a lot of computation time. The results from this approach, in most cases, cannot be obtained in real time.

Designing a stereo system for distant terrain modeling requires an extended baseline, or distance between the two cameras, in order to obtain a reasonable depth resolution. As the width of the baseline increases, so does the flexibility of the system, causing the orientation of the cameras to deviate from their original state. A set of tools have been developed to generate 3-D point clouds from rigid and flexible stereo systems, along with a method for applying corrections to a flexible system to regain distance accuracy in a flexible system.