A
REPORT
ON

ASSISTIVE TECHNOLOGIES FOR THE VISUALLY IMPAIRED

By

Ameya Joshi	2010A3PS005G
G.A.Pavan Kumar	2010AAPS018H

At

Ducere Technologies, Hyderabad

A Practice School –II Station of

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI (Rajasthan)

November, 2013

A
REPORT
ON
ASSISTIVE TECHNOLOGIES FOR THE VISUALLY IMPAIRED

By

Ameya Joshi	2010A3PS005G	Electrical And Electronics
G.A.Pavan Kumar	2010AAPS018G	Electronics And Communications

Prepared in partial fulfillment of the
Practice School-II Course No.
BITS C412/BITS G639

At

Ducere Technologies, Hyderabad

A Practice School –II Station of

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI (Rajasthan)

Month year

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE,
PILANI-(Rajasthan)

Practice School Division

Station: Ducere Technologies Pvt. Ltd.
Centre: Hyderabad **Duration: 6 Months**
Date of Start:4th July, 2013 **Date of Report Submission:26th November, 2013**

Title of the Project: Assistive Technologies for the Visually Impaired “”

Name	ID No	Discipline of Student
Ameya Joshi	2010A3PS005G	Electronics and Electrical
G.A.Pavan Kumar	2010AAPS018H	Electronics and Communications

Name	Designation of the Expert
Krispian Lawrence	C.E.O.

Name of the PS Faculty: Dr. S. Sindhu

Key words: StereoVision, OpenCV, Android, Obstacle Detection, Navigation, SONAR,

Project Areas:Computer Vision, Image Processing, Stereo Vision

Abstract: We provide a description of the research and development process of **LeChal**, an navigational shoe for the visually impaired. The report discusses the various subsystems concentrating the obstacle avoidance system. We provide an in depth look at the theory and implementation of the Sonar and 3D vision based navigation system along with a brief overall view of the complete system. We also give examples of the various use cases and a few trial examples. The prototype uses stereo correspondence using BRIEF[**?**] descriptors and BruteForce matching using the L2 norm in order to calculate the disparity map in order to provide the depth values. We then use a homography based algorithm to calculate the height of an obstacle[**?**]. The prototype supplements this data with a Sonar reading to detect an obstacle and provide feedback using a vibrational motor. The prototype gives very accurate results in the controlled environments tested so far. Further testing is to be done in conjunction with the LV Prasad Eye Institute, Hyderabad to get clinical certification.

Signature of Student **Signature of PS Faculty**

Date **Date**

Acknowledgements

Table of Contents