VIH

VISUALLY IMPAIRED HELPER

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Introduction

Studies conducted by the WHO from June 2012 indicate that **285 MILLION** people are visually impaired.

285 MILLION

Approximately **90%** of the worlds visually impaired are situated in 3rd world countries.

90%

It is estimated that 19 MILLION Children under the age of **15** are visually impaired and approximately 1.4 MILLION are blind for life.

15 YEARS OF AGE

Problem Statement

Many visually impaired people require walking sticks or guide dogs, the problem with these methods is that they do not leverage the technology that is available today, guide dogs are also very costly, take time to train and are not always readily available.
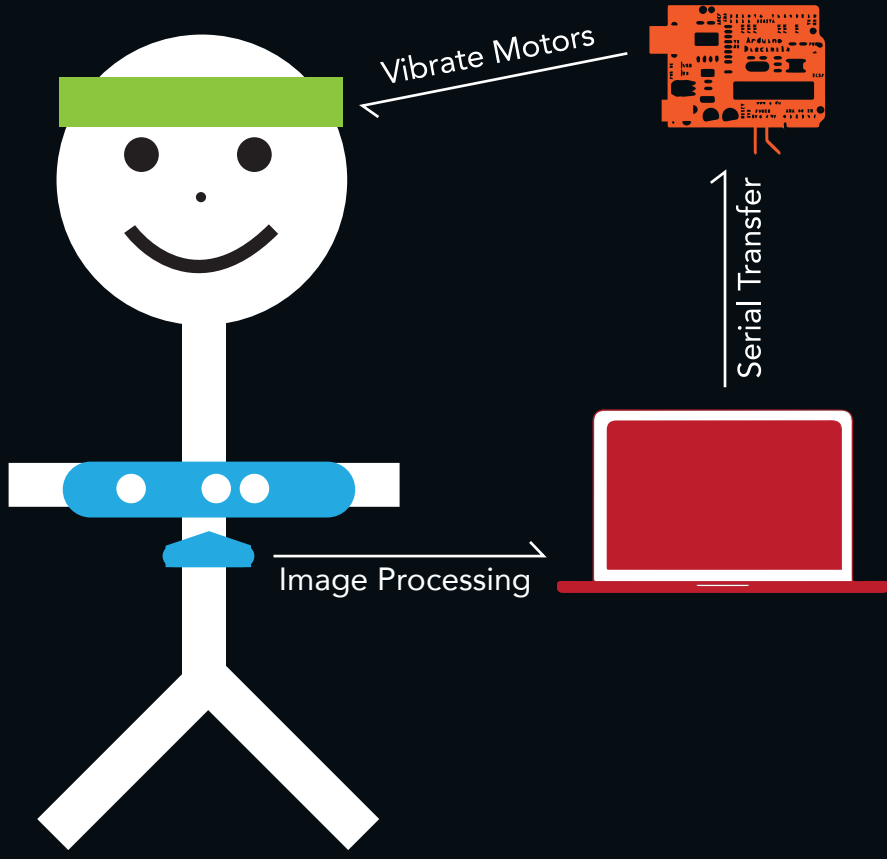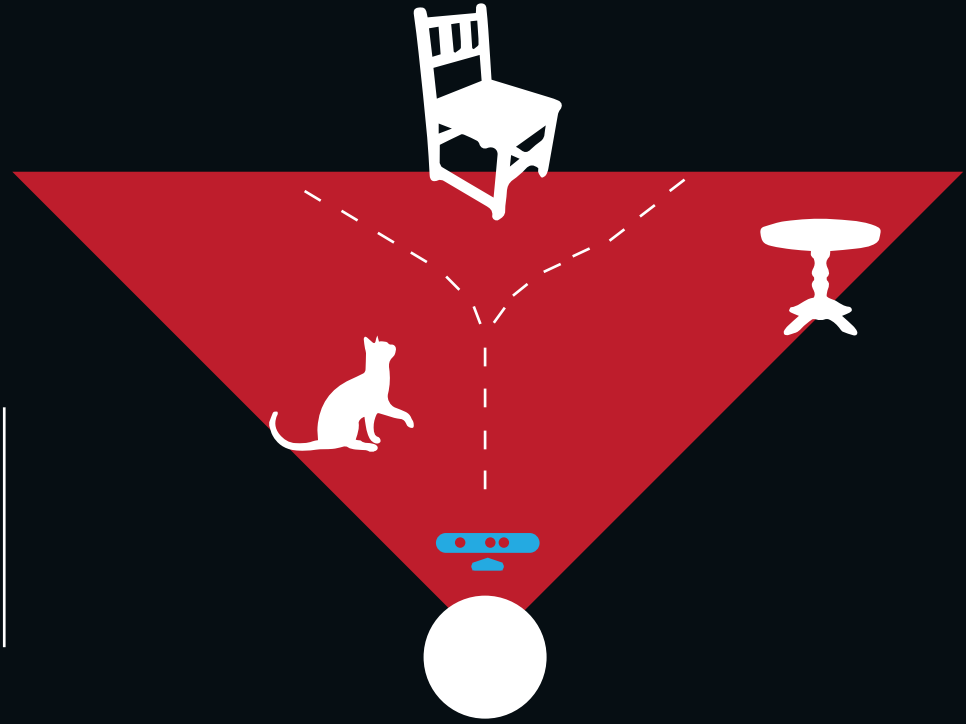
WITH DOG

WITH STICK

WITH VIH

Vibrate Motors

Serial Transfer

Image Processing

500 MM MIN

4000MM MAX

Requirements Analysis and Implementation

A live video stream / pre-recorded video. The video stream will be obtained using the Kinect (Depth & RGB Frames)

Image processing will be done using the OpenCV library and KinectSDK. After the image has been processed the results will be stored as JSON encoded objects.

An arduino board will function as the micro controller that controls the vibration motors in the headband. It will vibrate specific motors based on the input from the image processing done using the Kinect Frame Input.

User Requirements

The system should allow the user to decide where he/she should move to not collide into objects and other people.

It should be noted that this is purely for research purposes as of now, perhaps using what i've learnt we can extend this into a product.

Project Plan

GOALS	DUE DATE
Learn Basic of OpenCV and Get Kinect Interfacing With OpenCV + BLOB Detection.	END TERM 1
Design & Development, design the headband and get prototype working.	END TERM 2
Implementation, get Kinect component interfacing with arduino controller and headband	END TERM 3
Testing & Evalutation, user testing	END TERM 4

References

World Health Organization. (2012).
Visual impairment and blindness. Retrieved from
http://www.who.int/mediacentre/factsheets/fs282/

Linda G. Shapiro and George C. Stockman (2001). Computer Vision.
Prentice Hall. ISBN 0-13-030796-3

David A. Forsyth and Jean Ponce (2003). Computer Vision, A Modern
Approach. Prentice Hall. ISBN 0-13-085198-1.

Tim Morris (2004). Computer Vision and Image Processing. Palgrave
Macmillan. ISBN 0-333-99451-5

Kinect Sensor (n.d.). Retrieved March 20, 2013, from
http://msdn.microsoft.com/en-us/library/hh438998.aspx