Drishti: Beyond The Sight

Nvidia Jetson Developer Challenge

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Motivation

Sign-Post Identification

(a)

(b)

(c)

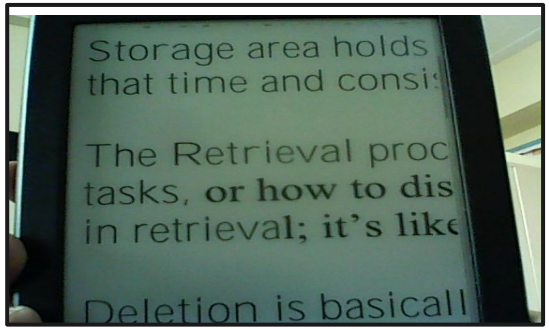
Figure: Identification of Sign boards and real world entities
(a): Sign Post showing Directions
(b): "No Pedestrian Crossing" Sign
(c): Alarm Warning in Mumbai Local trains

Currency Identification

Figure: Our Visually Impaired friends trying to identify currency notes

- **Whenever there is change in design of Currency, it becomes hard to recognize**

Right to Education...With Convenience



Outside of a Dog A book is man's best friend
Inside of a Dog it is too dark to read
- Groucho Marx

System Architecture

Image Acquisition & Pre-processing using OpenCV

On-board Label Generation using ImageNet Model and CAFFE Deep Learning Framework

Sound Output generated using Open Source *trans* library

Use Case 1: Book Text Extraction

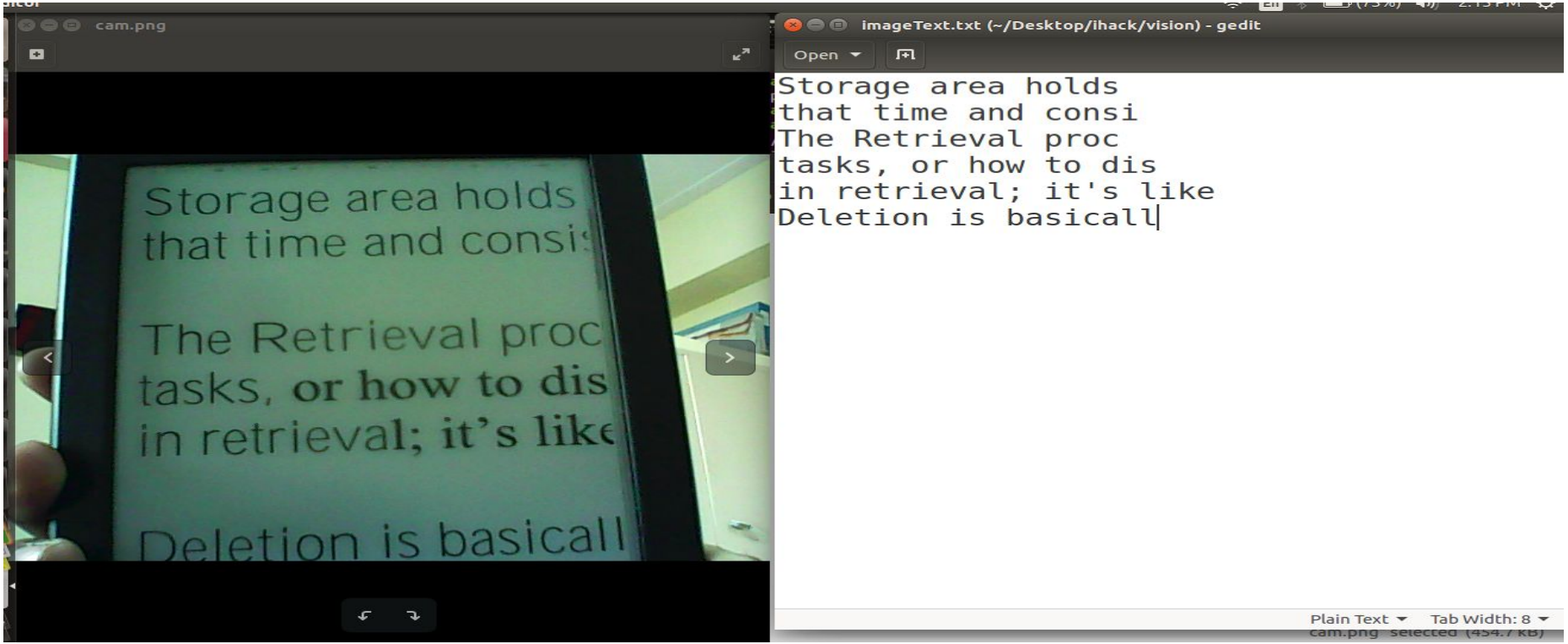


Figure: Output showing extracted text from Kindle

Use Case 2 (a): Surrounding Awareness

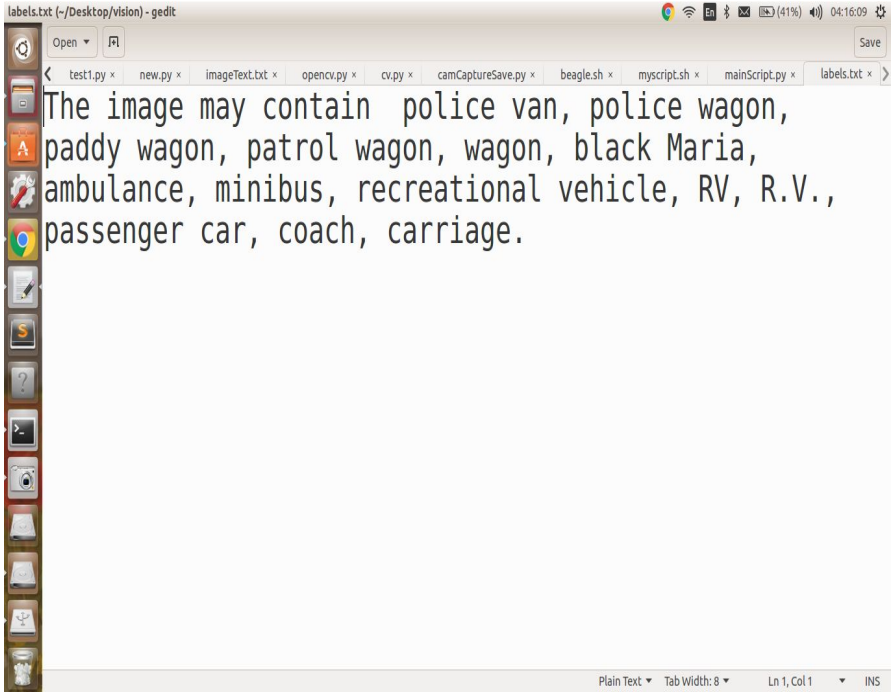


Figure: Labels generated out of an image showing Police Van

Use Case 2 (b) : Surrounding Awareness

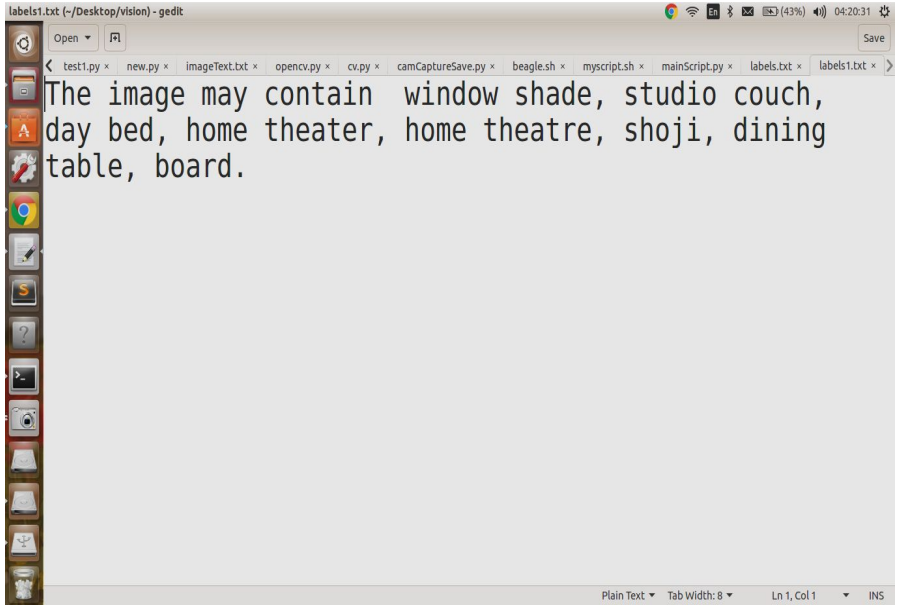


Figure: Labels generated out of an image showing A Room

Equipments Used

- **Nvidia Jetson Tegra K1**
  - **We intend to replace it by Nvidia Jetson Tegra X1**
  - ***Drishti* is compatible to be implemented using any of the Jetson TX1, TX2 and, TK1**
- **JBL Headphone**
  - **To listen to the generated output**
- **C170 Logitech WebCam**
  - **To capture images**

Why Nvidia Jetson?

- **An Embedded SuperComputer**
  - **Our use cases demands near-real time and accurate onboard processing of the images captured by the camera**
  - **Portability and**
- **Implements compute intensive Deep Learning Models**
  - **Capable of executing complex computations parallely**
- **Active Jetson Open-Source community**
  - **The Nvidia Jetson community is very active**

Cost Estimation

Equipment	Cost
Nvidia Jetson TK1	192 USD
C170 Logitech WebCam	14.69 USD
JBL Headphone	10.85 USD
Total Cost:	217.54 USD

Future Scope

- We intend to improve the design into an aesthetic design
- Reduce the size of the complete design to make it more convenient for use
- Improve the **Accuracy** of the Deep learning models

Courtesy: Google Images

Thank You

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