mellowain

360 Degree Product Sampler

High Level Design Document

Update document here

1. Overview:

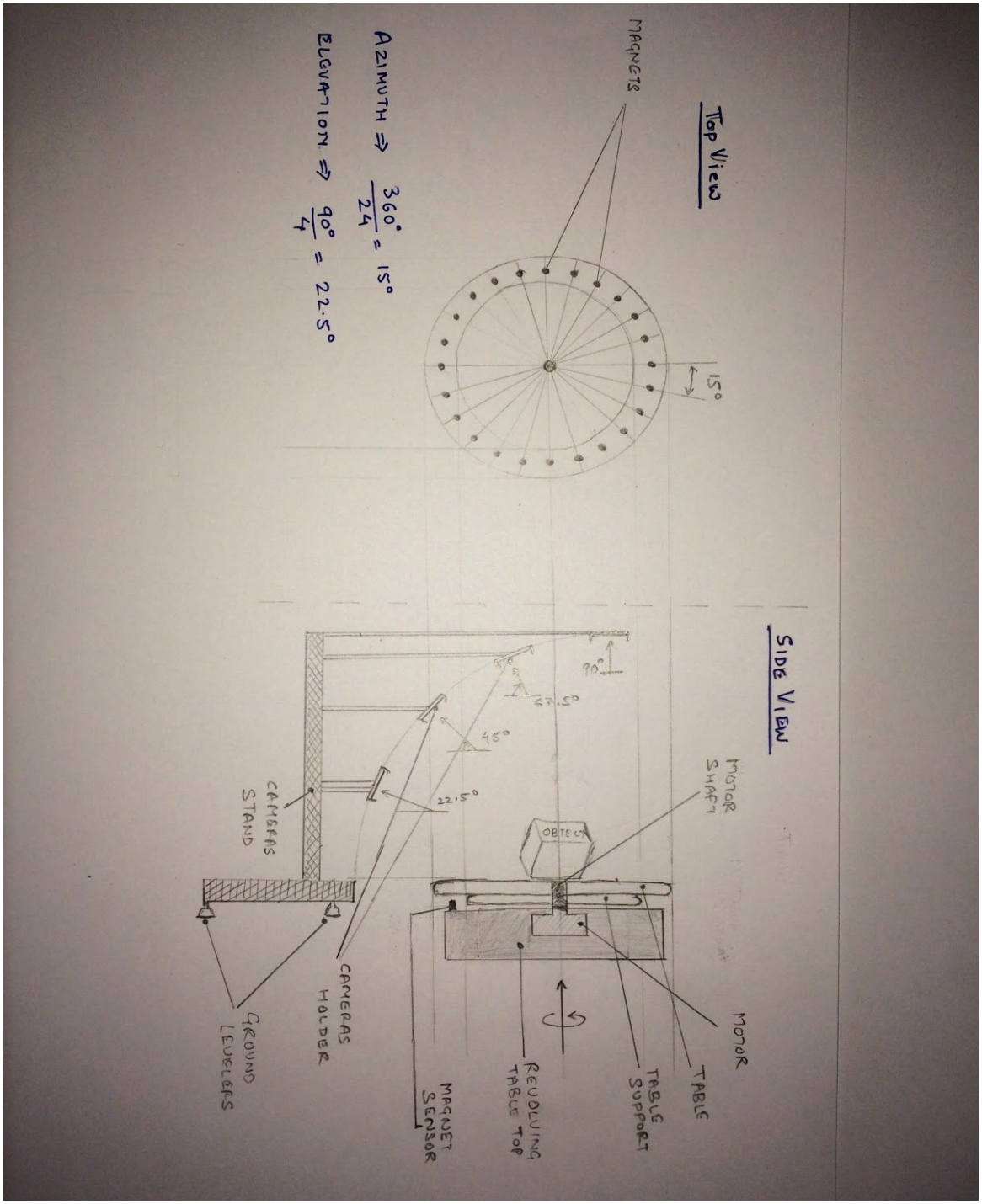
This document details required and design for an image sampler based on research paper. This sampler is meant for image sampling that can be later used for training an image classifier. To get best quality and appropriate image samples the paper concludes following:

1. Azimuth - Object should be revolved 360 degree at least 24 times in equal angle. This means 360/24 = 15 degree.
2. Elevation - In a circular fashion object should be captured in four verticals i.e. 90 degree / 4 = 22.5 degree.

2. Product Mechanical Drawing:

There are two parts to the design:

- 360 degree revolving tray and,
- Camera arch to hold four cameras, each at 22.5 degree angle in a semi circle.



Revolving tray has 24 magnets each at 15 degree angle and when these magnet cross magnet-sensor, it signals camera to take a snap. These four cameras are mounted on camera stand. Each camera is angled at 22.5 degree in a circular fashion, that is radially all cameras are same distance from the object.

3. Bill of Material:

- Stepper motor with step size of 15 degree per step.
- Arduino UNO Board.
- Relay
- Lazy Susan Bearings.
- We can use five high speed cameras or digital cameras (DSLRs) for our purpose.

4. Various Circuits:

Motor, Arduino and DSLR camera all are connected to PC/Laptop via USB cable. USB HUB may be required if the port are not enough on the PC/Laptop.

The circuit has to be connected as per the specification:

1. Arduino and stepper motor interface.
2. Other DSLR's

5. Working flow:

Following actions and events occur during sampling:

1. Place the object on the revolving table,
2. Enter the barcode so that the respective folder will be created with the name as 'barcode #'
3. Follow the on screen messages to switch ON the motor and image capturing.
4. Once 360 degree movement is over, the motor stops.
5. To capture another object jump to step 1.