**1 Evaluation**

Good morning/evening sir,

we are team bitknights from bajaj institute of technology, wardha

----------------------problem statement---------------------------------

These is our the problem statement which is given by ministry of rural devlopment in which We have to build a system where we have given 3 coordinates along with length and width of area as an input. By using those inputs, we have to extract that polygon.It can be easy to draw a polygon If the area of assets is any regular geometric shape, like a rectangle, square, or quadrilateral, However, as we all know, buildings and other assets can have any irregular shape, where geometric shapes are not possible. So we have to provide a generalised way which will be able to extract any shape.

-----------------------Need of Problem---------------------------------

But why these problem arise? so here are some points

1] In the MGNREGA scheme, funds to build assets are transferred from government body to local body. In this process, there are a lot of irregularities in taking funds without building proper assets. As a result, we can use this system to confirm the registered asset polygon.

3] We can observe and check the accuracy of assets even in dense area.

2] Similarly, in the PMYAG schema, in the case of home renovation/extension (in EWS & LIG categories), the given the carpet area of the home can be a max of 323 sq. ft. and 645 sq. ft. so through the system we can check if there is any extended area during renovation.

4] The polygon features are 2 dimensional, therefore the system can be used to calculate the area and perimeter of a geographical Structure.

------------------------------GIS & RS-----------------------------------

India has made remarkable progress in the field of satellites. With the help of satellites, we can even see the minor changes happening around us. For our system, the accuracy of real-time data is very important. If data is not regularly updated, the results (//and decisions derived from spatial analysis//) are unreliable. For resolving these problems, we are using GIS and remote sensing. ( Remote sensing is used for collecting physical data to be integrated into GIS & through GIS we can analyze, and understand the data. Remote sensors collect data from objects on earth without any direct contact.) The major advantage of using these softwares is data update occurs in every 24 hours.

------------------------Image Processing-------------------------------

Let's move towards our solution approach . Firstly, we capture the image of the locality in which the area is present, as shown in the first image .

Then mark the given 3 coordinates according to the length and width of that particular area which we have to find.

1. By taking 3 coordinates, we'll find the centroid of the 3 points.

2. After that, we'll take the 100m distance in four directions i.e East-West-North-South.

3. By using these distance we'll cut out the square image with the required developed asset at center.

4. And after that, we have to process the image with the help of segmentation for saperating the required asset.

So the end result after clipping the square area is shown here.

**2 Evaluation**

1 slide------------------------------Segmentation-----------------------

For further processing, we will use the segmentation process

what is segmentation?

Segmentation is nothing but digital image processing that partitions an image into different parts according to their features and properties.

In this, we are using segmentation, in which the darker area and brighter area will be separated, and we'll automatically get a polygon. As the roofs of buildings are brighter and the surrounding area is shaddy, the tops of buildings will be seen as a polygon. The brighter areas work as a solid polygon, while the darker areas will be the boundary of the polygon.

Now let’s move towards the code for the segmentation process:

1. First we will read the image and show it. An image is created by using RGB (thats mean it is created by combining the intensity of red, blue, and green colors).

2. In the second image, we are reading this colour image, and we will now convert it into a grayscale image, i.e., the image will be converted into black and white (meaning the part which is more reflected will turn into white and the part which is not or less reflected will be turned into a grey or black shade in the image).

Grayscale is the simplest model since it defines colours using only one component, that is lightness. The amount of lightness is described using a value ranging from 0 (black) to 255 (white).

On the one hand, grayscale images convey less information than RGB. However, they are common in image processing because using a grayscale image requires less available space and is faster, especially when dealing with complex computations.

\*\*\*\*\*\*\*\_\_\_\_Advantages:\_\_\_\_\_\_\_\*\*\*\*\*\*

We need 8\*3 = 24 bits to store a single colour pixel of an RGB colour image (8 bits for each colour component), but when we convert an RGB image to a grayscale image, we only need 8 bits to store a single pixel of the image. So we will need 33 % less memory to store a grayscale image than to store an RGB image.

Grayscale images are much easier to work with for a variety of tasks, like In many morphological operations and image segmentation problems, it is easier to work with a single-layered image (grayscale image) than a three-layered image (RGB colour image).

It is also easier to distinguish the features of an image when we deal with a single-layered image.

Grayscale conversion is also a vital part of image processing. RGB, or colour information, has a 3D property that makes signal processing so much more bulky and heavy. To remove these drawbacks, grayscale conversion is necessary.

3. Now, by using Canny's method we will detect the image of a building which is inside the rectangle. And here we see that we are getting the proper shape of a building, which is a rectangle.The advantage of Canny is that it produces very thin and clean edges.

2 & 3 slide--------------------------Segmentation--------------------

4. As it is, it all depends on the clear visibility of the image on the map. If it is more clearly visible, then it will give the accurate shape of the building or plot.

5. Now we will process the image and convert it back to an RGB image from a greyscale image. Hence, we have got the final and accurate irregular shape of the building that we have chosen.

-------------------------------adv & dis-----------------------------------

Here are some beneifits of our system

if the image is clear then situation become win-win for situation for us we will get accurate result. Even we can check an approximation and overview any asset at any place if we have 3 cordinate along with length & width. even if human error, like inaccuracy of coordinates, occurs. There are not much drawback its for only specfic user is that a blurred image cannot detect an edge.cost will go high depending on work we have to do in system

Edge detection is an image processing technique for **finding the boundaries of objects within images**. It works by detecting discontinuities in brightness. Edge detection is used for image segmentation and data extraction in areas such as image processing, computer vision, and machine vision

he advantage of Canny is that **it produces very thin and clean edges**.

The most powerful edge-detection method that edge provides is the Canny method. The Canny method differs from the other edge-detection methods in that it uses two different thresholds (to detect strong and weak edges), and includes the weak edges in the output only if they are connected to strong edges. This method is therefore less likely than the others to be affected by noise, and more likely to detect true weak edges.

<https://justin-liang.com/tutorials/canny/>

cattle shed, polutry farm, ponds , nursery, and much more

consider a building we have given with 3 coordinate