

Research Article

Measure of Diameter of an Object Within an Image using MATLAB

Premala Bhande¹, Kavya Hanamashette², Manuja Metre², Shweta kote²

¹Professor, ²Student Department of Electronics and Communication Engineering, Guru Nanak Dev Engineering College Bidar, Karnataka, India.

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Corresponding Author:

Premala Bhande, Department of Electronics and Communication Engineering, Guru Nanak Dev Engineering College Bidar, Karnataka, India.

E-mail Id:

kashipremala@gmail.com

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A B S T R A C T

Object detection from remote sensing images is basic for a wide scope of uses, item situated precision evaluation assumes a crucial part in ensuring its quality. To assess object extraction exactness gauges that contrast from the standard. First region based and object number-based exactness appraisal measures are given dependent on disarray framework. Second, extraordinary exactness evaluation measures are given by joining the likenesses of different highlights. Third, to improve the dependability of the item extraction exactness appraisals results. Two precision appraisals estimate dependent on article detail contrasts are planned. As opposed to existing measures, the introduced technique synergizes the component closeness and distance distinction. In view of these thought this paper is introduced.

Keywords: Matlab, Diameter, Image, Measure, Image Processing Toolbox

Introduction

A new object detection technique is proposed for complex environment, it is particularly important for target tracking, activity recognition and behavior understanding. The key idea of the research is selecting competent color features and merging them with experience subtraction method. First, the features used to segment the image should have these characteristics that, specifically, integrity and sensitivity.

Following bilateral study, the hue-intensity feature is extracted from HSI color space, the regular which the color feature shifts with time and the lighting density is researched. It solves the problem that correctly reflecting the disparity of the similar objects, which is a challenge for the past method. For something else, object recognition approach ought to be vigorous amazingly, to adjust to the circumstance that enlightenment changes, moving aggravations, etc. The foundation deduction technique is received to defeat these issues subsequent to choosing

suitable foundation model and the system that used to refresh the model. The examination results exhibited that the proposed technique built trustworthy foundation model and got the exact objective zone regardless of the distinction among forefront and foundation is momentous and unobvious.

Measuring objects inside a picture or edge can be a significant capacity for some applications where PC vision is needed as opposed to making actual estimations. This application note will cover a fundamental bit by bit calculation for segregating an ideal article and estimating its diameter.

Though this application note we will be able to write matlab script file to import an image, segment the image to isolate the desired object from its background and then use the Matlab functions that come with the image processing toolbox to determine the objects diameter. It is assumed in this application note that the reader has a basic knowledge of matlab.

As in any other system development model, system analysis is the first phase of development in case of Object modeling too. In this phase, the developer interacts with the user of the system to understand the functioning.

Based on this system study, the analyst prepares a model of the desired system. This model is purely based on what the system is required to do. At this stage, the enactment details are not taken care of. Only the model of the system is made up of a set of interacting objects. The important in this paper firstly we must open the matlab software and in the application section, download the image processing toolbox then we must create a new matlab script file. Then begin adding code to import the desired image to Measure into the matlab workspace. The first few lines clear the workspace to remove the previous variables and clear the command window. It is important that the current folder that you are working out be the folder that contains both the script file and the image. The command `imread` reads an image and converts it into three-dimensional matrix in the RGB color space. The image used in this tutorial is ball. Which is 534 by 401 pixel image. The `imread` function converts this into a matrix that is 401*534*3 (Rows*Columns*RGB). The final dimension corresponds to a red, green, blue intensity level. Use `imshow` to view the produced image bin a new window.

Segment the image into a binary image to differentiate the background from the desired objects. The first step taken is to divide the image into three images based on intensities of each red, green and blue component within the image. This is called color-based segmentation. Blue plane is the best choice for image thresholding because it provides more contrast between the desired object and the background. Image thresholding takes the intensity image and converts into binary image. A value between 0 to 1 determines the which pixel will be set to one or zero.

Methodology

To decide the size of an article in a picture, we first need to play out an "alignment" (not to be mistaken for inborn/extraneous adjustment) utilizing a reference object. Our reference item ought to have two significant properties:

- **Property 1:** We should know the components of this article (regarding width or stature) in a quantifiable unit, (for example, millileters, inches, etc.)
- **Property 2:** We should be able to easily find this reference object in a picture, either dependent on the position of the article, (for example, the reference object continually being set in the upper left corner of a picture) or through appearances (like being a particular tone or shape, special and not quite the same as any remaining items in the picture). In one or the other case, our reference ought to be exceptionally recognizable in

some way We should know the elements of this article (regarding width or stature) in a quantifiable unit, (for example, millileters, inches, etc.)

By guaranteeing the quarter is the left most objects, we can sort our object contours from left to right, grab the quarter (which will always be the first contour in the sorted list). And use it to define our pixels per metric, which we define as:

$\text{Pixels per metric} = \text{object width} / \text{known width}$

A US quarter has a known width 0.955 inches. Now, suppose that our object width (measured in pixels) is computed be 150 pixels wide (based on its related bounding box).

The Pixels per metric is therefore:

$\text{Pixels per metric} = 150\text{px} / 0.955\text{in} = 157\text{px}$

Thus, suggesting there are roughly 157 pixels per every 0.955 inches in our image. Using this ratio, we can calculate the size of the objects in an image.

Process



Figure 1

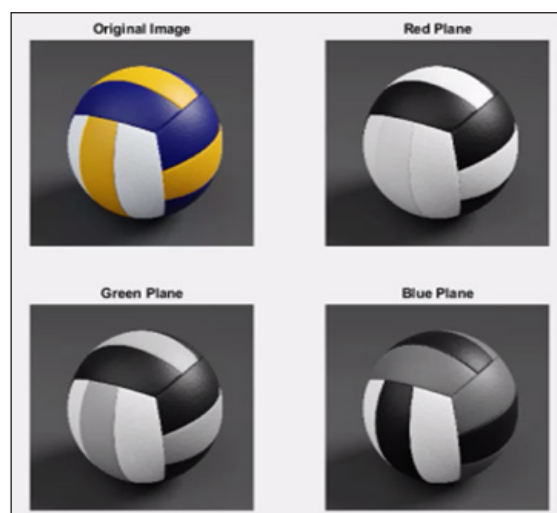


Figure 2

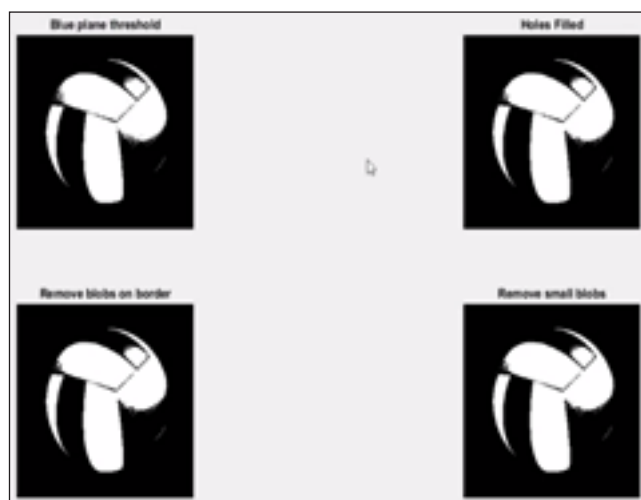


Figure 3

The image in the bottom right corner of Figure 2, is the result of all image segmentation and cleanup procedures to provide on distinct and cohesive blob, which represents the blob in the original image. Having a original in a binary form such as this will make it easy for other functions built into matlab to quickly analyze the region and a host of different information. The region prop function is the tool that will provide the major axis length of the blob in the image (Figure 1).

The image in the bottom right corner of Figure 3 is the result of all image segmentation and cleanup procedures to provide one distinct and cohesive blob, which represents the blob in the original image. Having the original image in a binary form such as this will make it easy for other functions built into matlab to quickly analyze the region and host of different information. The region prop function is the tool that will provide the major axis length of the blob in the image.

The contrast between object based and pixel based precision measures is the appraisal unit. Contrasted with the pixel, the item comprises of numerous comparative pixels, along these lines has more highlights. The item number-based exactness measures consider include contrast yet overlook the component detail distinction and level of distinction among assessed and reference objects.

In the event that the zone incident rate was utilized as a model to pass judgment on comparability, two assessed items would be judged effectively. Anyway two assessed items would be judged mistakenly, if the greatest deviation distance was utilized as the recognizing measure. Along these lines, the accurately separated item number can't completely mirror the distinction between two assessed objects.

System Testing and Implementaton

In this first we have done the testing of the system, First

is Unit Testing this testing this testing is made first, by giving improper inputs, the errors occurred are noted and eliminated.

Second one is Integration trying this testing is accomplished for every module, in the wake of testing all the modules are coordinated and testing of the last framework is finished with test information, uniquely intended to show that the framework will work effectively in the entirety of its conditions.

And the last one is Validation testing, which determines whether the software functions as the user expected. The main aspect of this entire project is based on the full satisfaction of the end users. In the paper, validation testing is made in various forms.

- Implementation is the process of converting a new system design into operation
- It is the phase that focuses on user training, site preparation and file conversion for installing a candidate system
- The important factor that should be considered here is that the conversion should not disrupt the functioning of the organization

Programming testing is an examination directed to give data about the nature of the item, it likewise gives an evenhanded, free perspective on the product to permit the business to acknowledge and comprehend the danger of programming execution.

White box testing is the point at which the analyzer approaches the inward information structures and calculation including the code that actualize these:

- API testing
- Code coverage
- Fault injection method
- Mutation testing
- Static testing

Code Efficiency

- Measures of code efficiency
- Uniqueness: The code structure must ensure that only one value of the code with a single meaning is correctly applied to a give entity
- Expandability: The code stricture are design for in away that it must follow for growth of its set entities
- Conciseness: The code requires the least conceivable number of positions to incorporate and characterize every thing
- Uniform size and arrangement: Uniform size and organization is profoundly alluring in motorized information handling framework
- Simplicity: The codes are planned in a basic way to comprehend and easy to apply

- Versatility: The code permits adjusting effectively to reflect essential changes in conditions, attributes and relationship of the encoded substances
- Sortability: Reports are most valuable for user efficiency when sorted and presented in a predetermined format
- Stability: Codes that do not require to be frequently updated also promote use efficiency
- Meaningfulness: Code is meaningful

Result



Figure 4

Conclusion

- To handle this issue, this paper present four new test measures with different criteria
- The designed measurements are highly generalize and provide the users with practical measurements and object extraction result according to their unique needs

Future Scope

The given framework can likewise be utilized with the assistance of the AI module which may upgrade the precision and viability of figuring the item breadth and length of it.

References

1. Guanter L, Segl K, Kaufmann H. Simulation of optical remote sensing senses with application to the En Map hyperspectral mission. *TGRS* 2009; 47: 2340-2351.
2. Bovensmann H, Buchwitz M, Burrows JP et al. A Remote sensing technic for global monitoring of power plant CO₂ emissions from space and related applications. *Atoms meas. Tech* 2010.
3. Pajares G. Overview and current status of remote sensing application based on unmanned aerial vehicles. *photogram. Eng remote Sens* 2015; 81: 281-329.
4. Yu Q. Object based detailed vegetation classifications with airborne high special resolution remote sensing imaginary.photogram. *Eng remote sense* 2006.
5. Blaschke T. Object based image analysis for remote sensing. *JSPRS J Photogram remote sense* 2010; 65: 216.
6. Chen A, Ahmadi MA, Chen Z. Comparison of machine learning methods for estimating permeability and porosity of oil reservoirs via petro-physical logs. *Petroleum* 2018.
7. Qutami AL, Ibrahim, Ismail et al. Radial basis function network to predict gas flow rate in multiphase flow. *Proceedings of the 9th International Conference on Machine Learning and Computing, ACM* 2017; 141-146.
8. Qutami AL, Ibrahim, Ismail et al. Virtual multiphase flow metering using diverse neural network ensemble and adaptive simulated annealing. *Expert Syst Appl* 2018; 93: 72-85.