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Web App Analysis and Identification of Macro Nutrients of Leaf

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Abstract: ***India is an agricultural country. Farmers are experiencing great difficulties in managing the fertilizer usage and decease rectification. Non-destructive nutrient deficiency analysis provides effective tool support for precise farming. According to the plant nutrition mechanism, leaf characteristics displays different changing trends under nitrogen (N) deficiency. In this paper the technique presented is for detection of macro nutrients and diseases identification in leaf. In this study, the dynamic capture of leaf by scanning was used to research the changing regulation of leaf characteristics under nutrient deficiency. The samples must be taken under the shadow of farmer. The work begins with capturing the images. From the captured images RGB components are extracted by segmentation process using K-Means clustering algorithm. In this process are host them using MATLAB web app serve, here end user can access and run this web app using browser without installing additional software.***
Keywords: K-means cluster, leaf color chart panel, web app server

I. INTRODUCTION

The input of image processing is in the form of image, video frame or photograph. Image is an array or matrix arranged in row and column of square pixels. The pomegranate plant disease detection technique is used in image processing. Due to causing of diseases the quantity and quality of the crops are decreases. For detecting the diseases in the plants digital image process is used. The color of leaf is differentiated by six shades. They are yellowish to dark greenish just like lush green color of leaf that show in fig 1. Nitrogen content is a common phenomenon in field management. The main goal of this paper is analysis of nitrogen content and evaluates an image processing based software solution for classification of plant diseases.

In general, the goals of this article are to

A. Analyse the five different samples of leaves using LCC panel.
B. Cross-match leaves with the panel under the shadow of farmer.
C. Identify N deficiency using LCC colour indices.

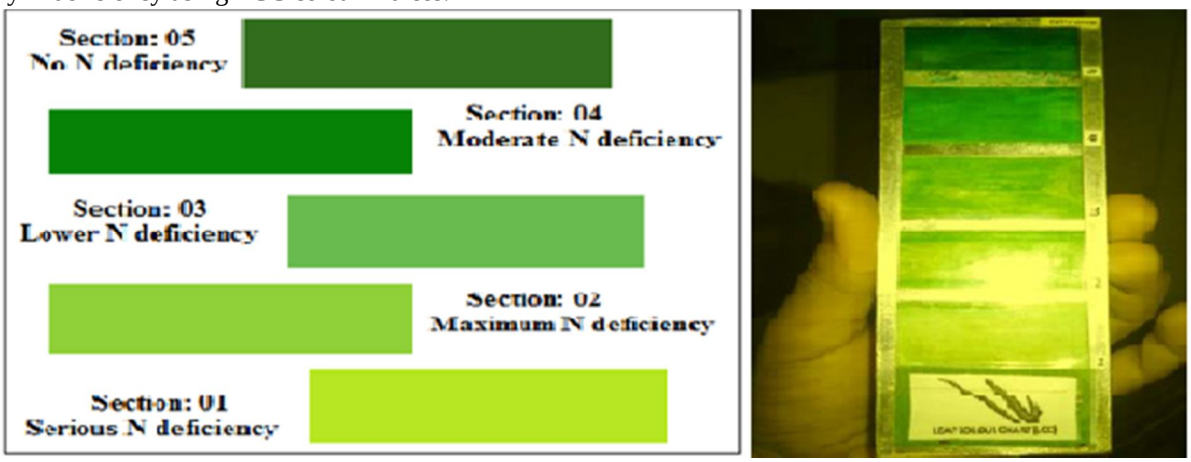

Fig.1. LCC panel

LCC helps to check the greenness of the leaf as an indicator of plant N status. Morphological symptoms are classified into six categories. They are Necroses, Growth abnormalities, Metaplastic symptoms, Proleptic symptoms, Proleptic symptoms, color changes, wilts this all are the symptoms of plant diseases.

II. LITERATURE SURVEY

A. In study [1] presents Using of MATLAB Web server (MWS) is attractive for students as well as for universities due to reduction of costs for both parties. Standard MWS applications support structured hands-on experiments welcomed for visualization of hard to grasp concepts and as a design tool. MWS applications for Math, power electronics and control design, part of a virtual laboratory created at University of Maribor, are represented. In addition a M-file MWS application-an example of unstructured MWS environment allowing students to write the MATLAB M-files of their own and to execute them on MWS is presented in detail. Only a simple text editor and an Internet browser are needed by a student to use M-file MWS application

B. This study [2] proposed Web-based interfaces are becoming popular. This article describes the general architecture and application of MATLAB Web Application without MATLAB web server. On the basis of probe into the MATLAB Builder JA and the developing with NetBeans platform, the basic process and method of development of MATLAB Web Application is summarized. Application example is presented which highlight how to model and develop applications with Java and MATLAB components, especially, use of the Web Figure provides a much more convenient way to illustrate details in a web page just as in MATLAB when required. It adopted Browser/Server mode, the design concept is Model-View-Controller mode, and it takes full advantage of the powerful calculation function of MATLAB and Web application of Java. The Internet-based application allows end users change predefined parameters and observe result in numerical or graphical online.

C. In Study [3] the dynamic capture of paddy leaf by scanning was used to analyses the changing regulation of leaf characteristics under nutrient deficiency. The samples must be taken under the shadow of farmer. It uses GLCM features and HSV decision tree. The paper begins with capturing the images. From the captured images RGB components are extracted by segmentation process using K-Means clustering algorithm. The GLCM features are extracted from the segmented image. These features are used to identify the diseases and Nutrient deficiency.

D. In Study [4] presents the stages of general plant diseases detection system and comparative study on machine learning classification techniques for plant disease detection. In this survey it observed that Convolutional Neural Netpaper gives high accuracy and detects more number of diseases of multiple crops.

E. In Study [5], about the dynamic capture of rice leaf by scanning was used to research the changing regulation of leaf characteristics under nutrition stress. The leaf characteristics were extracted by mean value and region props functions in MATLAB, and the leaf dynamics were quantified by calculating the relative growth rate. Stepwise discriminant analysis and leave one out cross validation was applied to identify NPK deficiencies. The results indicated that leaves with N deficiency presented the lowest extension rate and the fastest wilt rate, followed by P and K deficiencies.

F. In Study [6], Intended to aid in the detection and classification leaf diseases of grape using SVM classification technique. First the diseased region is found using segmentation by K-means clustering, then both color and texture features are extracted. Finally classification technique is used to detect the type of leaf disease. The proposed system can successfully detect and classify the examined disease with accuracy of 88.89%.

G. In Study [7] The proposed plant disease detection system consists of two phases, in the first phase, the knowledge base is established by introducing a set of training samples in a series of processing that include first use pre-processing techniques such as: cropping, resizing, fuzzy histogram equalization, extracting a set of color and texture features and used to great the knowledge base that used as training data for support vector machine classifier. In the second phase, we use the classifier that was trained using the knowledge base for detection and diagnosis of plant leaf diseases. To create the knowledge base, we used 799 sample images that divided it by 80% training and 20% testing. The proper state of each crop .The accuracy of disease detection was 88.1%.

H. Study [8] presents the RMatlab-app2web tool which enables the use of R or MATLAB scripts as CGI programs for generating dynamic web content. RMatlab-app2web is highly adjustable. It can be run on both, Windows and Unix-like systems. CGI scripts written in PHP take information entered on web-based forms on the client browser, pass it to R or MATLAB on the server and display the output on the client browser. Adjustable to the server's requirements, the data transfer procedure can use either the GET or the POST routine. The application allows calling R or MATLAB to run previously written scripts. It does not allow running completely flexible user code. We run a multivariate OLS regression to demonstrate the use of the RMatlab-app2web tool.

III. PROPOSED SYSTEM

This proposed system is used to identify the types of diseases and maintain nitrogen factor in plants. In this paper is fast, cost effective and accurate image processing solution. In this introduced a mordent technique to detect diseases oh leaves. The digital images are capture from the field and then image is processing to remove noise by using filter technologies and then multiclass

SVM techniques is used to classified leaf diseases. K-mean algorithm is discovered a affected region and color, texture are extracted. K cluster centers, either randomly or based on some heuristic method, for example K-means++. Assign each pixel in the image to the cluster that minimizes the distance between the pixel and the cluster center. Re-compute the cluster centers by averaging all of the pixels in the cluster. Repeat steps 2 and 3 until convergence is attained. LCC panel consists of hierarchal color patterns of green arranged in it. This panel have their description of color pattern and this panel are design depend on the regions. After image processing, feature extraction and image segmentation septs are finished that packages are compiled in MATLAB compiler. Then the full packages are configuring in web app server. Web app server host web app compiler is used by web app package. The home page is accessed from browser using a URL.

IV. PROCESS FLOW

Development version of web app in a server using in MATLAB is configured MATLAB compiler. Installed the MATLAB web app server in platform windows, Linux, macOS.

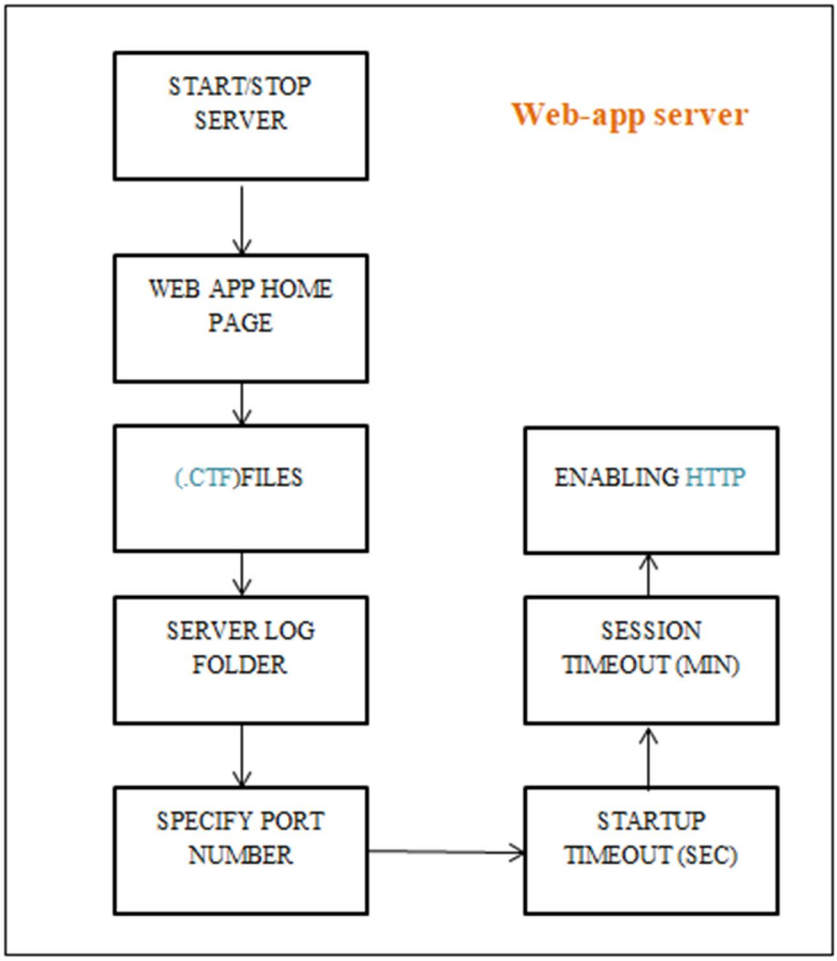

Fig.2. web app server

1) Step 1: state/stop the server
2) Step 2: open the web app home page
3) Step 3: open the app folder containing the web app archiver (.ctf) file.
4) Step 4: open the server log folder
5) Step 5: specified the port number. Default port is 9988.
6) Step 6&7: Startup Timeout is defined the maximum time to prepare a new session for requested app. Session timeout is defines the time interval in minutes after session will be stopped on the server
7) Step 8: enable the HTTP

In these paper windows operating system is used and click the service registration tab its show two different service account local and default. The installed service is configured and run once the service is successfully registered. Then click the configuration and run option in MATLAB web app server in that web app server flow fig.2. Start the server open app folder drop the *appName* .ctf file. Create App Path open web app home page specified the port number and apply to configure.

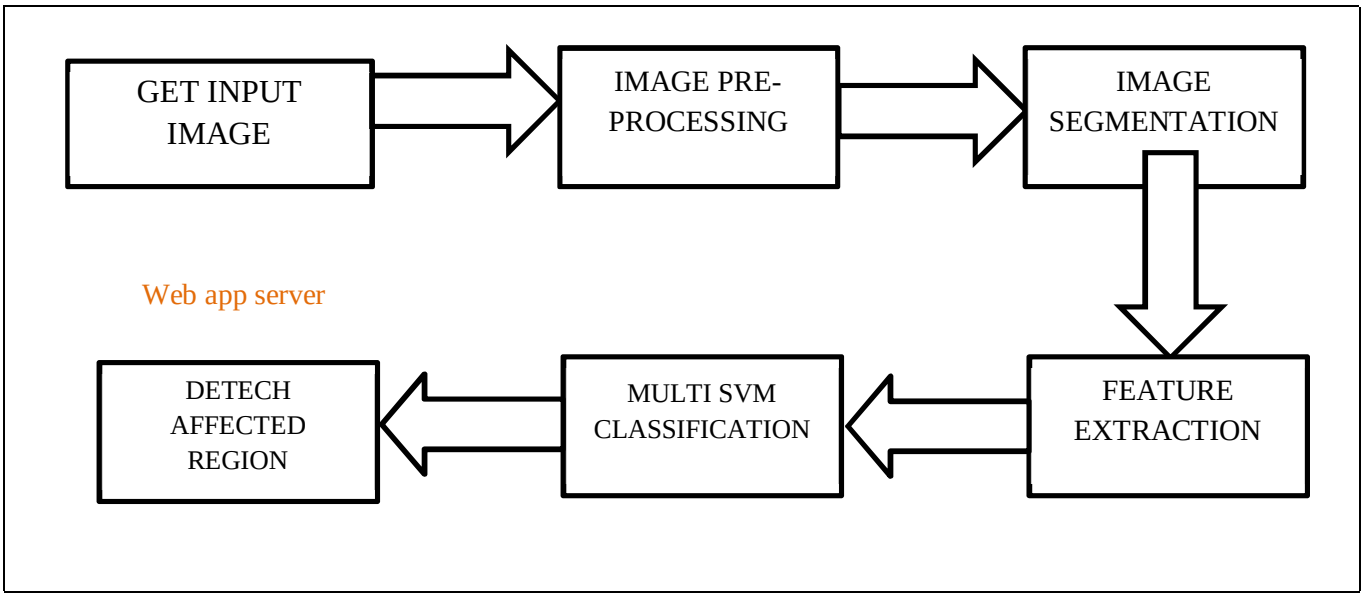

Fig.3.Module for image processing

Leaf image is load in RGB format and contrast image is shows the affected region accurately. Pre-processing the image further segmented the image considered as binary to grey image fig 3. A separate pixel to clusters in this mean of cluster is finding. Equation 1 support vector weights function used si,αi and bias b that are classify vectors x.

1) Equation 1: C=sumiαik (si, x)+b, where k is a kernel function.
In dataset contain the normal leaf color and LCC panel color, including masks for all images by binary image.
Standard deviation Equation 2 value dive us average color value of the image

$$\sigma = \sqrt{\frac{1}{N}\sum_{n=1}^{N}(P_K - E)^2}$$

2) Equation 2: Disease and Nitrogen content are analysis configure the MATLAB complier to MATLAB web app server that show in fig 4.

```
/apps
    myApp00.ctf
├── folder_A/
    myApp01.ctf
    myApp02.ctf
├── folder_B/
    myApp03.ctf
    myApp04.ctf
    myApp05.ctf
├── folder_C/
    myApp04.ctf
    myApp05.ctf
    myApp06.ctf
    myApp07.ctf
```

Fig .4. Configure MATLAB complier

V. RESULT & DISCUSSION

The result and interim outcome of variety of input is necessary variation of classic image is to be observed.

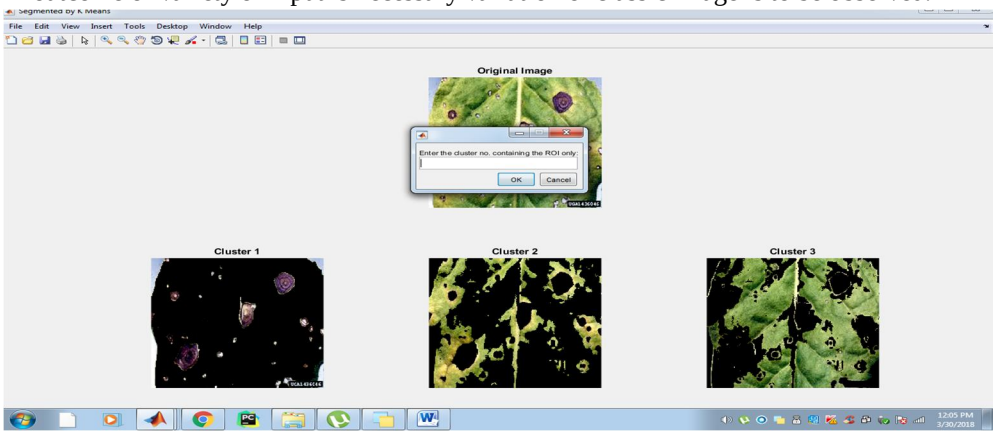

Fig .5. Segmentation Image

The image should first preprocess and contrast enhanced image is converted to gray format representation. Segmentation process is segmented the input image fig.5 in this disease can identified clearly.

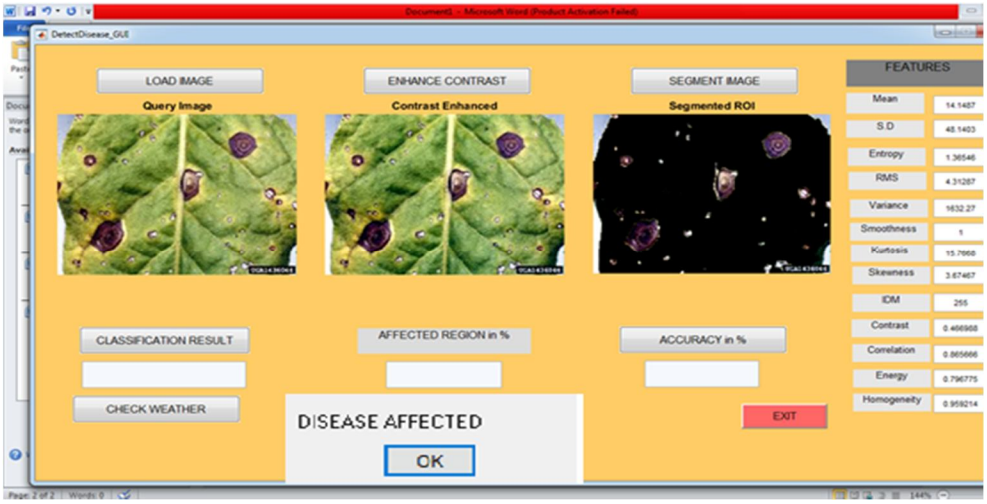

Fig.6. classification of diseases

Fig.7. Accuracy computation

Fig.6 among the segmented image one is processes. The accuracy of computation is display in Fig.7

VI. CONCLUSION

In this paper MATLAB web app is used so that end user can access and run the web page using browser. There is no need to install the software to run. In this experiment disease is identified at early stage and farmers can prevent the disease. SVM algorithm used this paper to classified plant diseases. The result accuracy range is around 96% and this can be bettered by increasing database, the result is obtained in real life image. Output of this paper is high accuracy and sensitive of diseases, classify the result and easily find out the type of diseases, client can access this web app easily. Future scope of this paper is web app can access through mobile phones using mobile browse or a mobile app.

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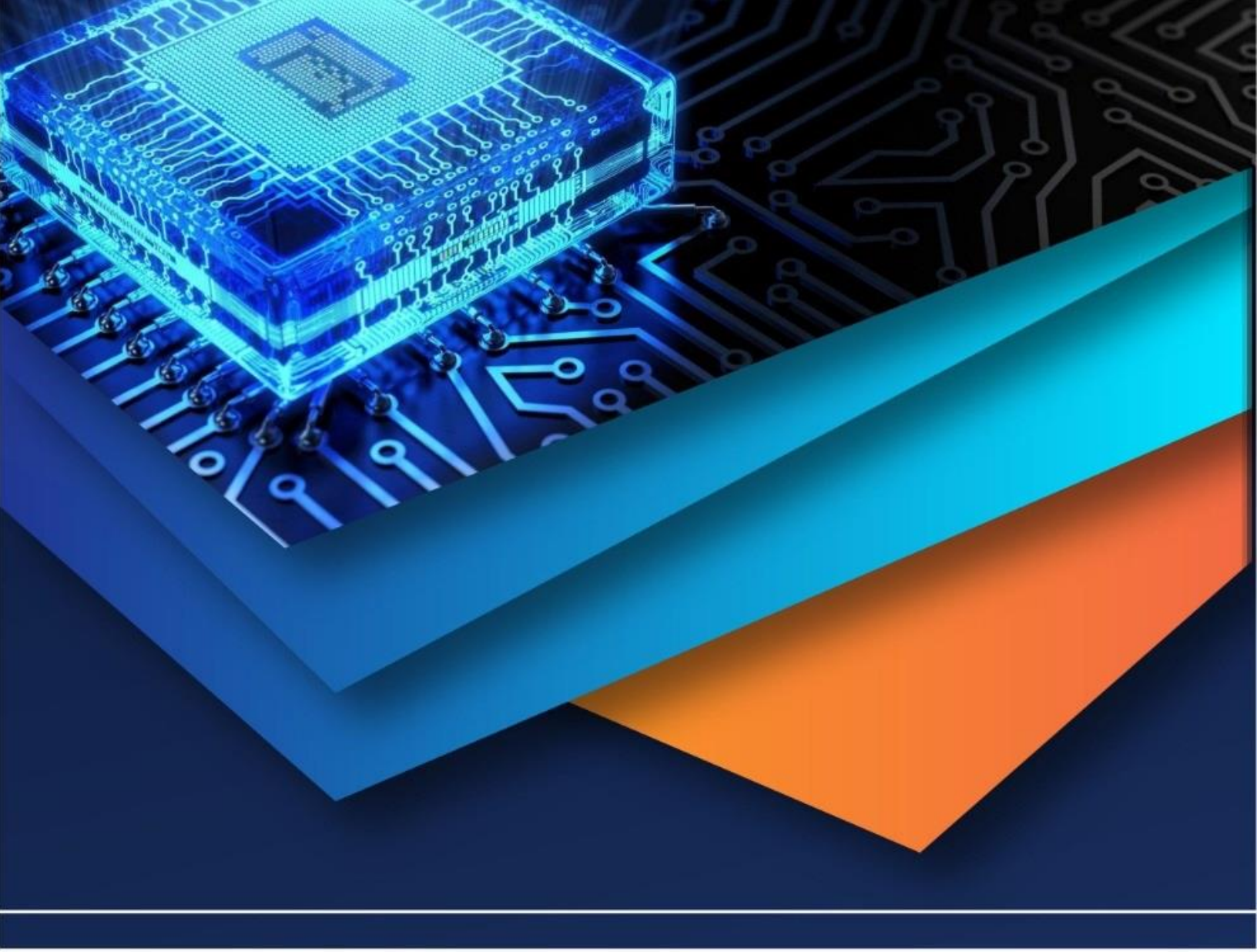

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