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Bird Species Identification using Deep Fuzzy Neural Network

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Abstract: ***In this paper author is describing concept to identify species of birds by using python Tensor Flow and Deep Learning algorithm. Earlier technique were using birds Voice or Videos to predict it species but this technique will not give accurate result as audio may contains background or other animal Voices. So images can be best option to identify species of birds. To implement technique this we need to train all birds species and generate a model and then by uploading any image deep learning algorithm will convert uploaded image into gray scale format and apply that image on train model to predict best match species name for uploaded image. To train bird species we are using 'Caltech-UCSD Birds 200(CUB-200-2011)' dataset which contains 200 species or categories of birds. Model will be built using that dataset and tensor flow deep learning algorithm.***
Keywords: Tensor Flow; Caltech- UCSD; Deep Learning Algorithm; Fine-grained recognition.

I. INTRODUCTION

The regular pace of life will in general be quick and wild eyed and includes extramural exercises. Winged animal watcher is a recreational movement that can give unwinding in everyday life and elevate strength to confront day by day difficulties. It can likewise offer medical advantages and joy got from getting a charge out of nature. Be that as it may, assembling and gathering data about flying creatures requires gigantic human exertion just as turns into an extremely costlier strategy. In such case, a solid framework that will give huge scope preparing of data about feathered creatures and will fill in as a significant instrument for analysts, legislative offices, and so forth is required.

Thus, winged animal species ID assumes a significant job in distinguishing that a specific picture of fledgling has a place with which animal groups. Fledgling species distinguishing proof methods anticipating the feathered creature species has a place with which class by utilizing a picture.

The recognizable proof should be possible through picture, sound or video. A sound handling method makes it conceivable to recognize by catching the sound sign of winged animals. Be that as it may, because of the blended sounds in condition, for example, creepy crawlies objects from genuine world, and so on preparing of such data turns out to be increasingly muddled. Ornithologists require concentrating all the subtleties of winged animals, for example, their reality in condition, their science, their conveyance, their biological effect, and so forth.

Winged animal distinguishing proof is typically done by ornithology specialists dependent on characterization proposed by Linnaeus: Kingdom, Phylum, Class, and order, family and Species. As picture based grouping frameworks are improving the errand of characterizing, objects is moving into datasets with undeniably more classes, for example, Caltech-UCSD. Ongoing work has seen a lot of achievement around there. Caltech UCSD Birds 200(CUB-200-2011) is a notable dataset for winged creature pictures with photographs of 200 classes.

The dataset contains fowls that are for the most part found in Northern America. Caltech-UCSD Birds 200 comprises of 11,788 pictures and comments like 15 Part Locations, 312 Binary Attributes, 1 Bounding Box. In this paper, rather than perceiving countless unique classifications, the issue of perceiving an enormous number of classes inside one class, due to the huge likeness between classes.

Also, flying creatures are non-inflexible articles classification is researched – that of feathered creatures. Arranging fowls represent an additional test over that can distort from various perspectives, and subsequently there is likewise a huge variety inside classes. At last, data acquired from a winged animal picture transferred by an end-client, caught utilizing a versatile camera, can be explored through the customer server design to recover data and anticipate feathered creature species from the prepared model put away on the server.

This procedure encourages productive connection of fine-grained object parts and self-governing fowl recognizable proof from caught pictures and can contribute impressive, important data in regards to winged animal species.

II. RELATED WORK

Fundamentally feathered creature distinguishing proof is done outwardly or acoustically. The fundamental visual parts involve fledgling's shape, its wings, size, present, shading, and so forth. Nonetheless, while considering the parameters season must be thought about in light of the fact that feathered creature's wings changes as indicated by their development. The acoustics segments contain the melodies and call that winged creatures make. The imprints that recognize one flying creature from another are additionally helpful, for example, bosom spots, wing bars which are depicted as slim lines along the wings, eye rings, crowns, eyebrows. The state of the snout is regularly a significant angle as a flying creature can perceived remarkably. The attributes of feathered creature, for example, shape and stance are the generally used to recognize winged animals. As of late, some fine-grained visual classifications techniques have been proposed for species distinguishing proof, and they have become a promising methodology inside PC vision investigate, with applications in various spaces.

The current framework utilizes the accompanying strides for feathered creature species recognizable proof:

1) First, crude info information of a winged creature were accumulated and limited. Second, the element vectors of every conventional part were recognized and separated dependent on shape, size, and shading.

2) Ultimately, data acquired from a winged creature picture transferred by an end-client, caught utilizing a portable camera, can be explored through the customer server design to recover data and foresee winged creature species from the prepared model put away on the server.

3) This process encourages productive relationship of fine-grained object parts and self-ruling fowl recognizable proof from caught pictures and can contribute impressive, significant data with respect to feathered creature species.

The current work moved toward the learning of discriminative picture highlights utilizing a DFNN design for fine-grained acknowledgment. In any case, a correlative methodology utilizing area information on general winged creature highlights was incorporated to give point by point data about the anticipated flying creature.

III. PROPOSED SYSTEM

In this paper creator is depicting idea to recognize types of feathered creatures by utilizing python TENSORFLOW and Deep Learning calculation. Prior strategy were utilizing feathered creatures Voice or Videos to anticipate it species however this method won't give exact outcome as sound may contains foundation or other creature Voices. So pictures can be best choice to distinguish types of feathered creatures. To actualize this method we have to prepare flying creature's species and produce a model and afterward by transferring any picture profound learning calculation will change over transfer picture into dark scale arrange and apply that picture on train model to foresee best match species name for transferred picture.

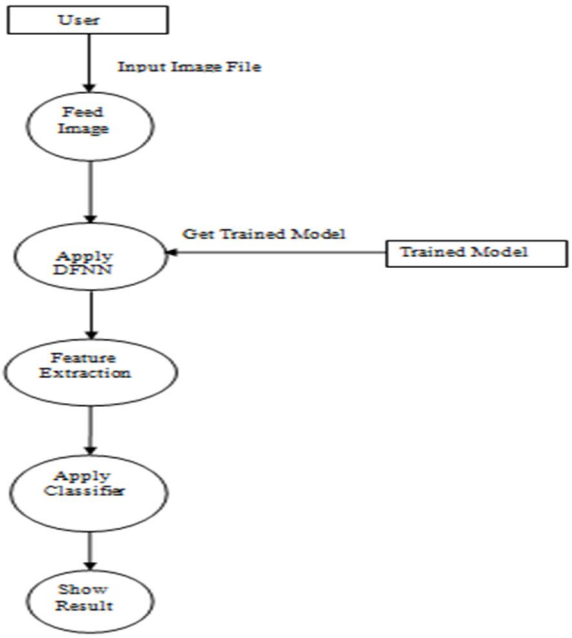


Figure 1: Flow of System

The above figure 1 speaks to the real progression of the proposed framework. To grow such framework a prepared dataset is required to group a picture. Prepared dataset comprises of two sections prepared outcome and test outcome. The dataset must be retrained to accomplish higher precision in distinguishing proof utilizing retrain.py in Google Collar. The preparation dataset is made utilizing 50000 stages contemplating that higher the quantity of steps higher is its precision. The exactness of preparing dataset is 93%. The testing dataset comprises of about 1000 pictures with an exactness of 80%. Further, dataset is approved with an exactness of 75% to expand the exhibition of framework.

IV. EXPERIMENTAL RESULTS & ANALYSIS

The assessment of the proposed approach for winged creature species grouping by considering shading highlights and parameters, for example, size, shape, and so on of the feathered creature on the Caltech-UCSD Birds 200 (CUB-200-2011) dataset. This is a picture dataset explained with 200 fowl species which incorporates 11,788 commented on pictures of winged creatures where each picture is clarified with a harsh division, a bouncing box, and paired property explanations. In this the preparation of dataset is finished by utilizing Google-Collar, which is a stage to prepare dataset by transferring the pictures from your nearby machine or from the Google drive.

1) Step 1: The below figure 2 are the results which were obtained when the program is executed.

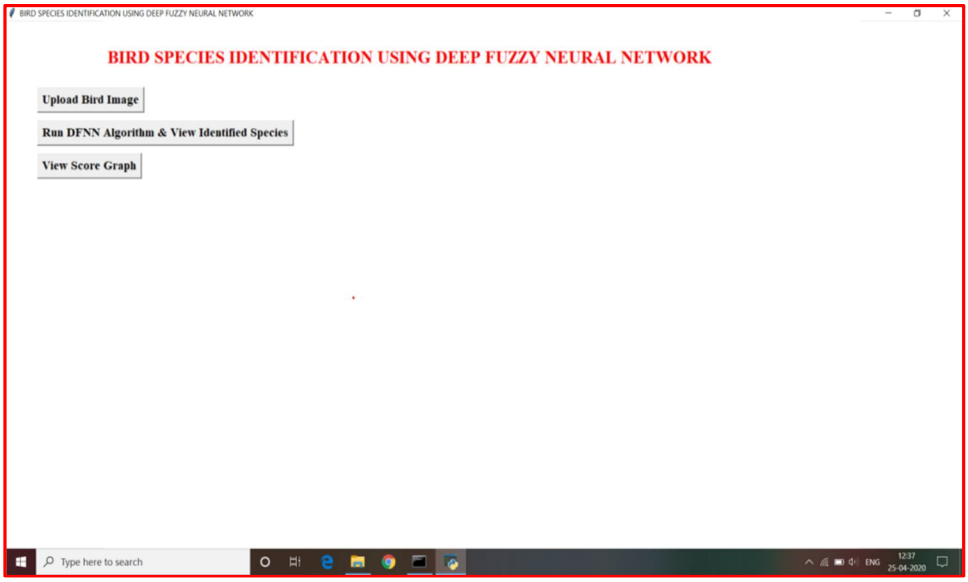


Figure 2: Test Image 1

2) Step 2: In above figure clicks on 'Upload Bird Image' button to upload bird image

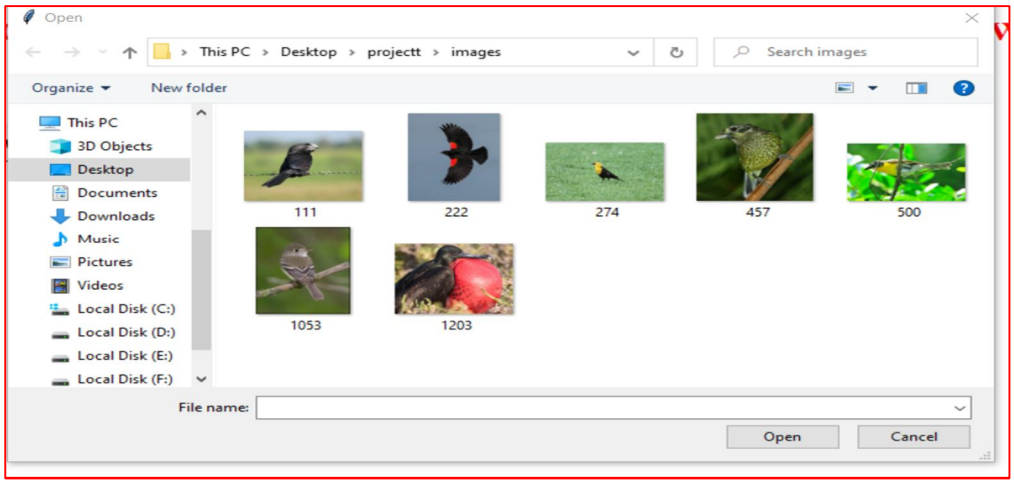


Figure 3: Test Image 2

3) *Step 3:* In above figure 3 some bird's images are there but we don't know its name or species name. So by uploading this image to application we can get their species name. To run this project double click on 'run.bat' files to get below screen

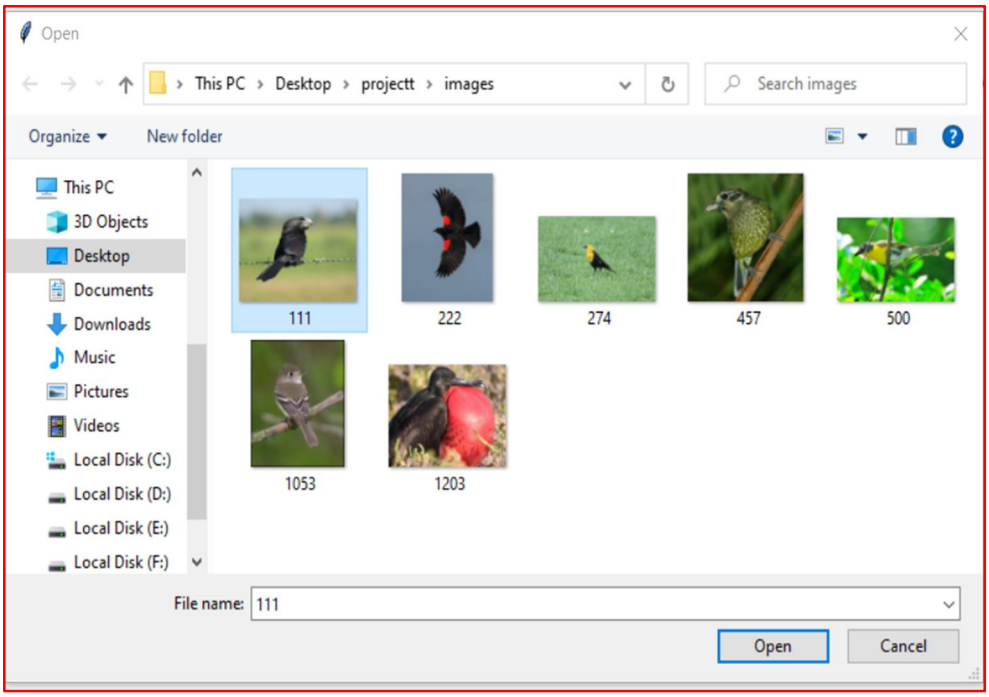


Figure 4: Test Image 3

4) *Step 4:* In above figure 4 I am uploading one image of bird called '111.jpg'. After upload will get below screen

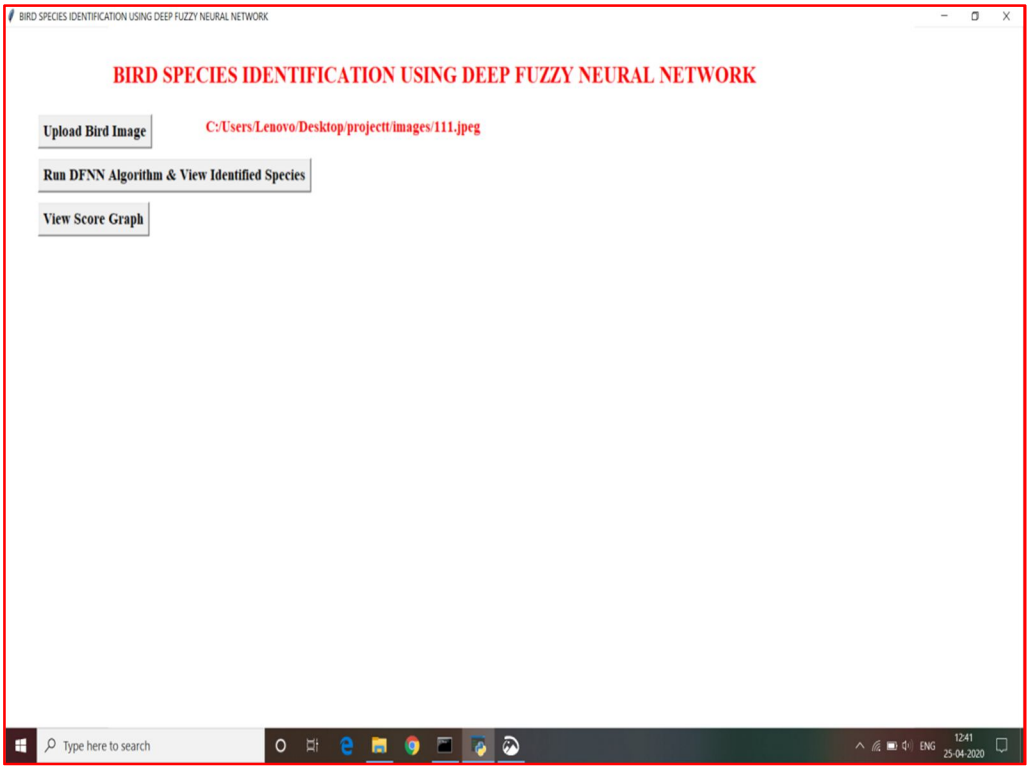


Figure 5: Test Image 4

5) *Step 5:* Now click on 'Run DFNN Algorithm & View Identified Species' button to know the species name of uploaded bird.

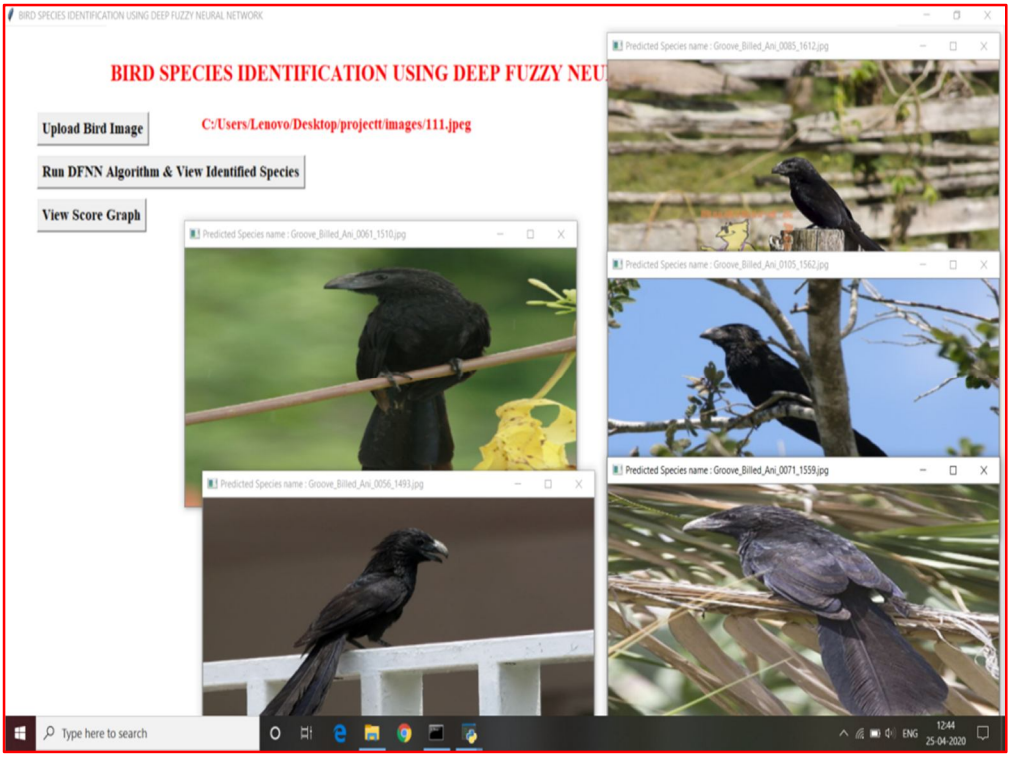


Figure 6: Test Image 5

6) *Step 6:* In above figure 6 we got 5 related birds images of uploaded image and we can see the species name of bird on title bar of image. So by uploading any image we can know the name of bird. You can upload any image and get it name and uploading image name should be as integer value.

Now click on 'View Score Graph' button to view the graph

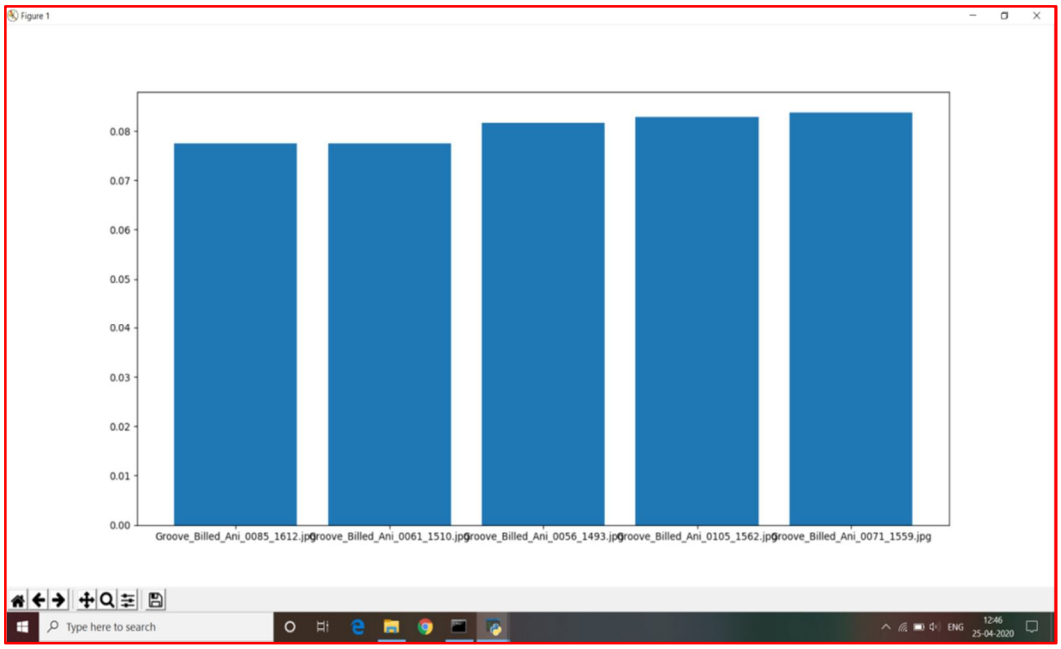
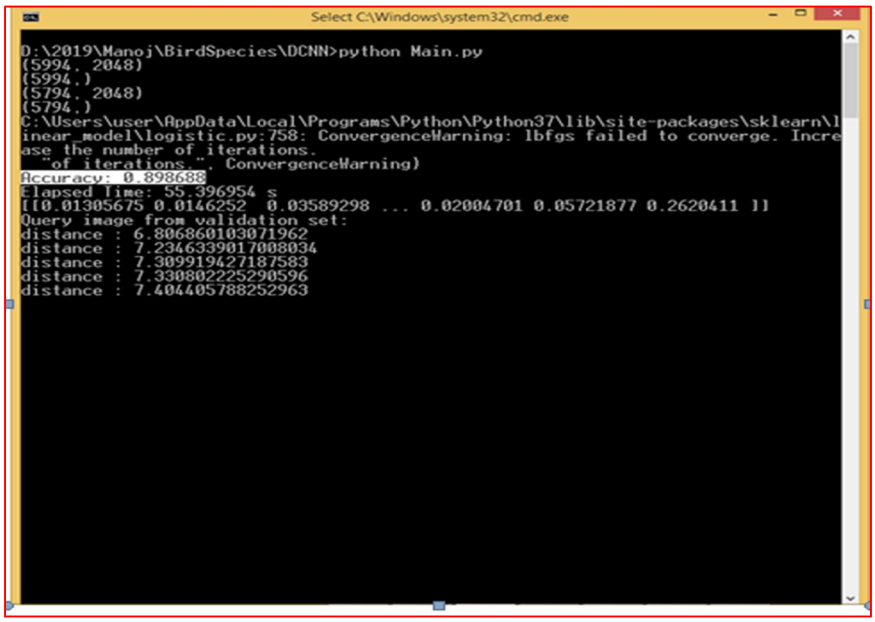


Figure 7: Test Image 6

7) *Step 7:* In above graph we got matching score of all 5 related birds and in above graph x- axis represents name of bird and y-axis represents matching score.

Accuracy value of his algorithm you can see in below screen



In above screen in selected text you can see Accuracy value.

V. CONCLUSION

The current examination researched a technique to recognize the fledgling species utilizing Deep learning calculation (Unsupervised Learning) on the dataset (Caltech-UCSD Birds 200) for order of picture. It comprises of 200 classifications or 11,788 photographs. The created framework is associated with an easy to understand site where client will transfer photograph for recognizable proof reason and it gives the ideal yield. The proposed framework chips away at the standard dependent on location of a section and separating DFNN highlights from various Fuzzy layers. These highlights are accumulated and afterward given to the classifier for arrangement reason. On premise of the outcomes which has been delivered, the framework has given the 80% exactness in expectation of discovering winged animal species.

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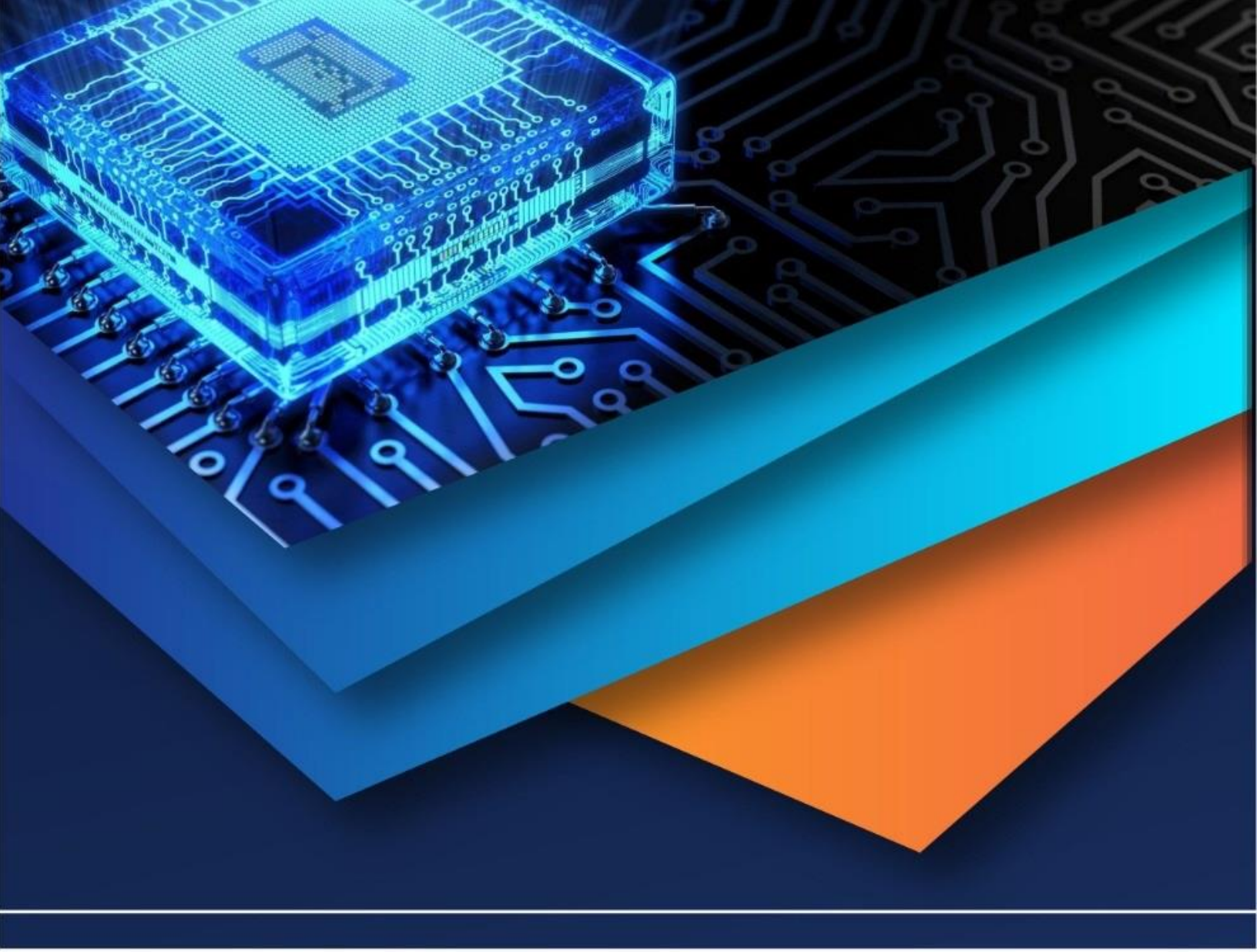

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