iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 **Issue:** VI **Month of publication:** June 2021

DOI: https://doi.org/10.22214/ijraset.2021.35386

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue VI Jun 2021- Available at www.ijraset.com

Automatic Personality Identification using Machine Learning

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Abstract: ***Machine Learning has made significant changes in the world making our life more easier and comfortable .One of the most exciting applications is the prediction of Personality automatically using different algorithms. Personality computing and emotive computing, where the popularity of temperament traits is important, have gained increasing interest and a spotlight in several analysis areas recently.***
These applications can powerfully predict the personality of a Person. The aim of this paper is to use a more rigorous construct Validation system to extend the potential of machine learning approaches to personality assessment. We have reviewed multiple recent applications of Machine Learning to recognize personality, thus providing a broader context of fundamental principles of constructing, validating, and then providing recommendations on how to use Machine Learning to advance the level of our understanding and applying our learnings to develop advanced personality recognition applications. araphrased Text Output text rewrite / rewrite We use deep neural network learning to recognize characteristics independently and, through feature-level fusion of these networks, we obtain final predictions of obvious personalities.
We use a previously trained long-term and short-term memory network to integrate time information. We train large-scale models comprised of specific subnetworks- modalities through a two-stage training process. We first train the subnets separately for and then use these trained networks to fit the overall model. We used the ChaLearn First Impressions V2 challenge dataset to evaluate the proposed method.
Our method achieves the most effective overall "medium precision" score, with an average score of for 5 personality characteristics, which is compared to the state-of-the-art method.
Index Terms: Deep Learning, Bi-Modal Neural Networks, First Impression Analysis, Apparent Personality Analysis, Automated Personality Identification, Long Short-Term Memory (LSTM) network, Personality traits.

I. INTRODUCTION

Psychologists have long studied human personality, and various theories to categorize, explain, and understand it have been proposed over the years. Personality detection using video, multimedia sources, and computer vision is one of the major tasks because personality is made up of a variety of qualities that combine to form a personality, and this portraying of personality is done in the professional / employability field, according to the Industrial Organization (I/O).

Since the recent past years, we have seen various developments of algorithms that were encouraged by human videos and photos that have become ubiquitous on the internet, these algorithms that can analyze the semantic content, various applications, first-person video analyses, activity recognition, gesture and pose recognition from the ubiquitous on the internet human-centered videos. Because personality detectors are widely used in employment selection, we will concentrate on industrial and organizational settings. Apparent personality analysis (APA) is a critical issue in human-centered video analysis that uses multimedia as a source. The ultimate purpose of APA for establishing algorithms for the purpose of recognizing the personalities they persist through the short video sequels . The old ethical way was the survey, where some employers use self-reported surveys to measure job applicants' personalities. Personality traits are usually splitted into experiences(the amount of time he/she has been in this field), conscientiousness(the trait where candidate he/she performs well , and is through), extraversion(this shows expression of candidates, tends to have good conversation), agreeableness(person with super ordinate quality), and neuroticism(this quality normally executes the fear, anger, anxiety etc).

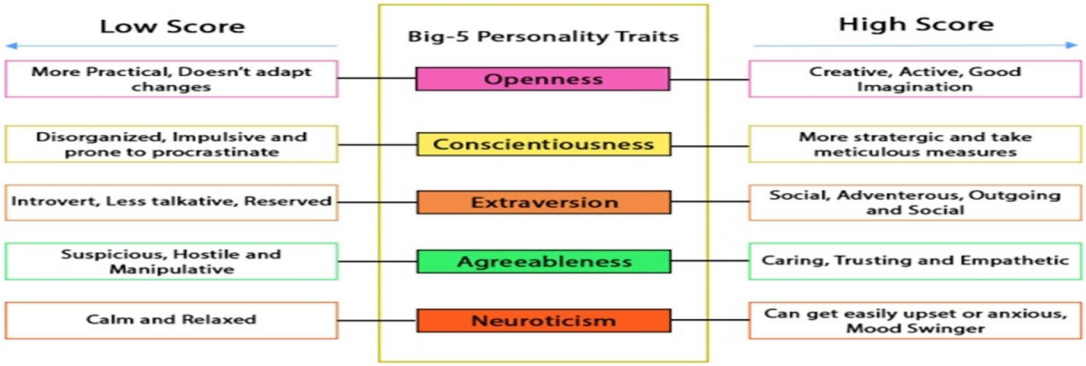

Figure 1:Big Five Traits

Ideal APA for recognition personality traits is challenging due to several factors such as accent and presentation pitch varies from person to person in rhythm and the way of persuasive, and showcase of being protrude , the incapabilities of capturing while the interview, noise in-camera channels, countless moments of out speech and fall short-of-words , but in the traditional method employers would evaluate from their facial expression and other nonverbal cues during the interview sessions held live, where faking the nonverbal cues inconsiderably difficult for the applicants. In this survey paper , we learnt about the Deep Bimodal Regression (DBR) framework for APA. The DBR framework is implemented , for the detection of the personality persisting by the candidates through videos, where these video is reconstructed in two modality namely video and audio modality consisting the deep visual and audio regression as factors of APA mainly focuses on personality traits. For audio modality regression in this model of deep bimodal regression a feature of extractor log filtration bank is used ,it will perform the extraction of audio from the videos .The next step is training of audio regression , and then sent back to log filtration after the run check of traits of personality indicated by the candidate.

II. LITERATURE SURVEY

In the ChaLearn Challenge 2016, the Deep Bimodal Regression (DBR) method had the best precision for perceived personality analysis. The visual modality regression, audio modality regression, and the ensemble method for fusing input from the two modalities are the three main aspects of DBR. Without the use of a functioning engine, the network is educated from start to finish. Without the use of a functioning engine, the network is educated from start to finish. The entirely linked layers are removed from the conventional CNN architecture[1], according to Y.Mehta & Alexander.

Berkay, Lale, Oya & Ahmet offered a basic model that incorporates three types of features: nonverbal audio cues, video visual cues, and facial landmark points[18]. To do regression from the derived functions, the model employs a random decision tree. In the role of personality profiling and identification of specific personality characteristics from short films, the multimodal model performs reasonably well. An overall surveying of all the features disclose the nearly all extracted features perform similarly obtaining accuracies in the range of 85%-89%.

Hung -Yue-Suen , Kuo-En-Hung & Chien Liang stated that the findings of this study indicate that using audio and visual modalities, it is possible to accurately recognize human affective states. As a result, the next generation of human-computer interfaces will be able to detect human input and react accurately and timely to changes in users' affective states, potentially enhancing the current generation's efficiency and interaction. Siileyman Aslan and Ugur Gudukbay propose a novel approach for the recognition of apparent personality traits from videos. They use a multimodal neural network that consists of modality-specific CNNs to extract facial expressions, and LSTM networks to integrate the temporal information of the videos. This modality network is effective for personality recognition and contributes to the final model. As future research directions, this paper envisions that correlation between personality, body movements, posture and emotion can be investigated to improve the performance. Heysem kaya proposes a system in which they provide different models to solve the difficulty of first impression analysis from video interviews or video blogs. They use deep learning based architecture to build on the result of detection. Efforts on automatic video based analysis of interview processes are scarce. They use a regression model and it helps in making suggestions for a person being interviewed. So on the report of the regression model the person can change the “hire ability”.

François Mairesse, Marilyn Walker proposes a system for Automatic Recognition of Personality in Conversation (2019).This paper

showed that personality can be recognized automatically in conversation. To our knowledge, this is the first report of experiments testing trained models on unseen subjects. Combinations of these models possibly applicable to identify important personality types in different applications. Automated Personality Classification Using Data Mining Techniques(2019) The main concept of this paper is nowadays social network examination has increased tremendously in recent years. To bring out the personality of the creator on the social networking site is beneficial for many applications in different domains counting marketability, satisfaction and happiness. Personality detection from the words means to bring out the habits of the creator who write down the words.

III. LITERATURE REVIEW

In the currently existing systems, the prediction of personality is performed based on picture frames of human-centered video clips of a short period. Which ultimately lead to the very small analysis of the photos and data abstraction as deep learning of personality is done on very small data. In the earlier technologies used was analysis performed on the human-centered where detection of face and personality traits from video and textual content through the survey conducted for the personality analysis of the candidate appearing for the purpose are used as parameters for prediction. The personality detection earlier was performed only on the basis of the human centered on ubiquitous internet and the interview performed which comes only facial expressions which is a partial aspect of the personality detection because facial outlook of the may not always be a parameter for personality detection because there are candidate blank expression but great in personality this can be drawback in the existing system. Earlier , where detection was done only on facial expressions and not Audio, here audio can overcome that drawback because vocal imitation is merely difficult but facial can be possible because expression is key role in video analysis for personality detection Social media data and Psychological Assessment, these systems were used for the aspect of personality detection where they can derive the thinking and personality traits that the candidate consists of through those assessment, but cheat code can be key over here to break through the assessment and create a non existing characteristic of the candidate, probability of this trap is bit high than usual. There was trend of time where CV

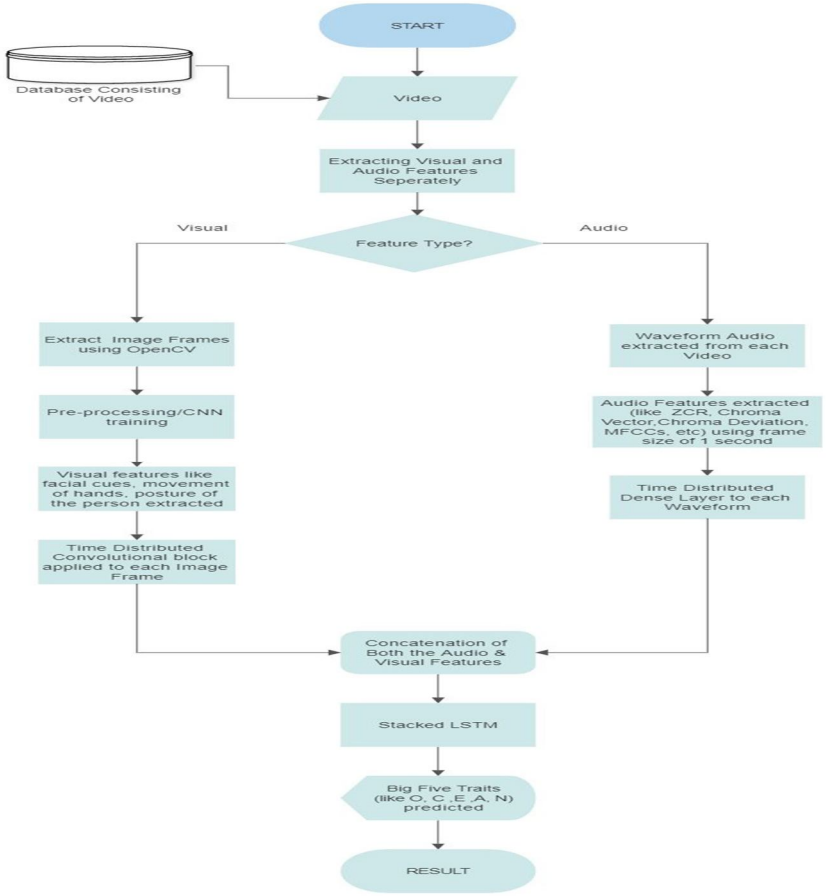

Figure 2: Flowchart of Proposed System

Resume of the candidate played the role for portrait of the skillset of strength and weakness, but that can be also the case where the candidate only disclosure the aspect which they want disclose, over here the precise portraying of personality is failed a very extent and this might lead to failure in recruitment you seem to head for Handwriting, here is to say people with a beautiful and clean handwriting are the ones with very good personality traits.

This judgement of personality is completely indefinable and no traits or parameters are playing a key role in this personality detection. The existing system and its drawback for personality detection led to revolutionary technologies and solutions to the problems and precise solutions with lesser casualties of failure.

IV. METHODOLOGY

A. *What is Machine Learning?*

The study of computer systems that learn from data and experience is known as machine learning (ML). Machine learning model is what is being learned from data, in order to solve given tasks. Machine learning is a study that enables computers the ability to learn without being specifically programmed. Machine learning algorithms are used in a wide range of applications where developing traditional algorithms to perform the required tasks is difficult or impossible, such as email filtering, advertisement, data processing, statistical monitoring, biometric recognition, and computer vision. Self-driving cars, speech recognition software, and a better understanding of the human genome are just a few examples of how machine learning has advanced society.

B. *Importance of First Impression*

A computer program capable of predicting a person's psychological profile in seconds could be useful for both businesses and individuals all over the world. According to other studies, video interviews are beginning to change the way applicants are hired through nonverbal visual human behavior analysis. The development and evaluation of automatic methods for personality perception is a delicate subject, prompting us to consider the still unanswered question, "What should be the technological limit?"

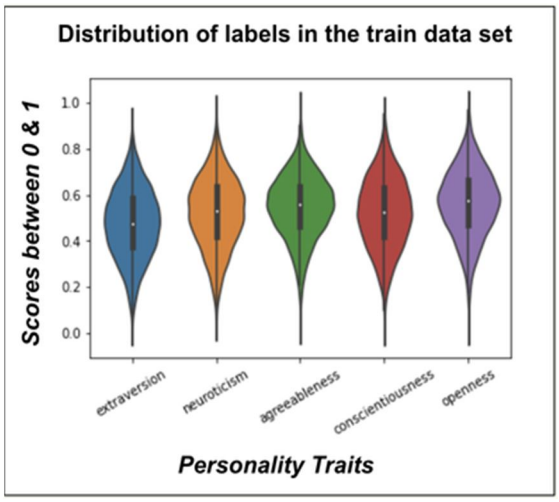

Figure 3:Personality Traits

The accuracy of the apparent personality recognition models is typically measured by how closely they approach's outcomes match the judgments of external observers (i.e., annotatability). The underlying assumption is that social perception technologies should not be used to predict the target's actual state, but rather the state that observers attribute to it, i.e. their impressions. As a result, automatic apparent personality trait analysis is a difficult and subjective process.

C. *What is the Five Factor Model of Personality?*

The Big Five Personality Traits model, which dates back to the late 1950s, is based on the results of many independent researchers. However, in the 1990s, the paradigm as we know it today started to take shape.

The model was given the name "The Big Five" by Lewis Goldberg, a researcher at the Oregon Research Institute. It is now widely regarded as a reliable and valued personality scale, with applications in business and psychological studies.

The Big Five Personality Traits are a collection of five personality traits that define an individual. The model assesses five major aspects of people's personalities:

1) *Openess* Also known as "Imagination" or "Intellect," this metric assesses your level of ingenuity as well as your appetite for new information and experiences.
2) *Conscientiousness* is a measure of how careful you are in your personal and professional life. If you've a high conscientiousness score, you are likely to be organized and thorough, and also know how and when to make and carry out plans. If you get a low ranking, you're probably lazy and disorganized.
3) *Extraversion/Introversion* is a sociability scale that tests how sociable you are. For example, are you gregarious or reserved? Do you get energized by crowds, or do you find it difficult to collaborate and communicate with them?
4) *Agreeableness* is a factor in deciding how well you get along with several you considerate, cooperative, and willing to make concessions? Or do you prioritize your own needs over those of others?
5) *Neuroticism* is the test that measures emotional reactions and is also known as "Emotional Stability" or "Natural reaction." Do you react to bad news in a negative or calm manner? Do you obsess over minor details?

D. Proposed System

For Apparent Personality Analysis, we will use the Deep Bimodal Regression method.

The DBR framework here treats candidates interviewed videos as reconstructed with two modules in particular, deep visual and audio regression modules are created for tracking the personality detection.

In the visual modules, the very first step is extraction of frames for the videos of those, which are human centered. After that, the adoption by CNN's for learning the regressions used for the prediction of personality traits. Studying the previous work of regression networks for the visual modules, there was a modification done of the traditional method Convolutional networks architecture Then, descriptors from the last, and second last that discarded the completely linked layers. layers of convolution neural network layers as mentioned earlier are average and max pool are in the featured vectors of the last convolutional layers, then the standard of normalization is followed, then combined together for the last stage of image representation, an addition of layer it is done for end-to-end training.

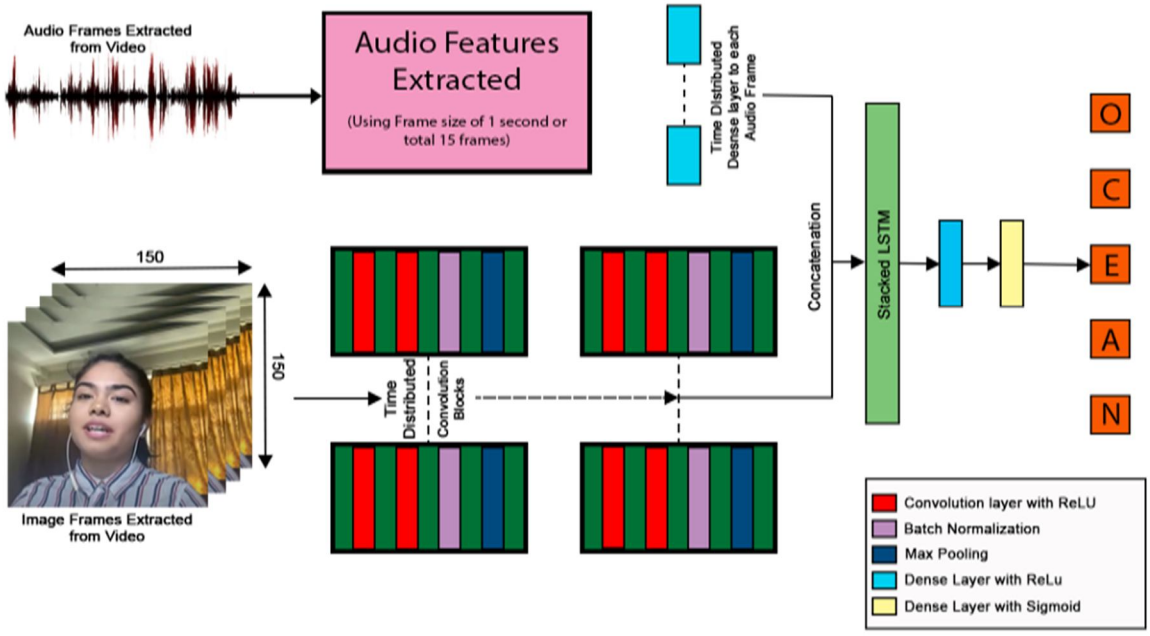

Figure 4: Overview of the Proposed System

This modification in the last layers of CNN's has given rise to Descriptor Aggregation Network (DAN). The assembly of these differentiating numbers of layers is performed for boosting deep regression performances for visual modules of deep bi-modal regression , where modality is signified DAN+ and other .

The epoch is implied to combine and boost the visual modality performance .
For the modules of audio in DBR, a feature extractor log filtration bank will be used, this will do extraction of audio from the human centered videos. And, then on the feature based on the bank of log filtration, a training is
done of the regression, this training is done, for a runcheck on the Personality traits, to be precise, the values for the Five Traits are retrieved and are obtained through this training of regression line of logfbank.
The data collection, which consists of 10,000 15-second images, was gathered. from various sources of ChaLearn, YouTube, etc related to the Personality traits/Big Five Traits. The data collection, which consists of 10,000 15-second images, was gathered. from various sources of ChaLearn, YouTube, etc related to the Personality traits/Big Five Traits. recognition, image classification, medical image analysis, and natural language processing.
A CNN consists of an input and an output layer, as well as a multilayer hidden network.
The hidden layers of a CNN typically consist of convolutional layers, pooling layers, fully connected layers and normalization layers. ConvNets derive their name from the “convolution” opera-tor. The primary purpose of Convolution in case of a ConvNet is to extract features from the input image. Convolution preserves the spatial relationship between pixels by learning image features using small squares of input data. We will not go into the mathematical details of Convolution here, but will try to understand how it works over images As we discussed above, every image can be considered as a matrix of pixel values. Consider a 5 x 5 x 1 image whose pixel values are only 0 and 1. An image from a standard digital camera will have three channels (RGB)red, green and blue. You can imagine those as three 2d-matrices stacked over each other (one for each color), each having pixel values in the range 0 to 255.
This here we describe the overview of vision normalization is followed , then combined together for the last stage of image representation , a addition of layer it is done for end-to-end training.
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V. CONCLUSION

In this paper, we presented an Automatic Personality Identification model capable of predicting the personality, where the personality is identified on the basis of the Big Five Traits using Video. The Deep Bimodal Regression Algorithm has been explained and an identification technique has been developed to effectively identify the personality. As the amount of data for this kind of models must be large, expanding the dataset into approximately 6000+ videos rendered the identification possible in most of the cases.
We found that processing the audio and video features separately instead of considering them together yielded better results.

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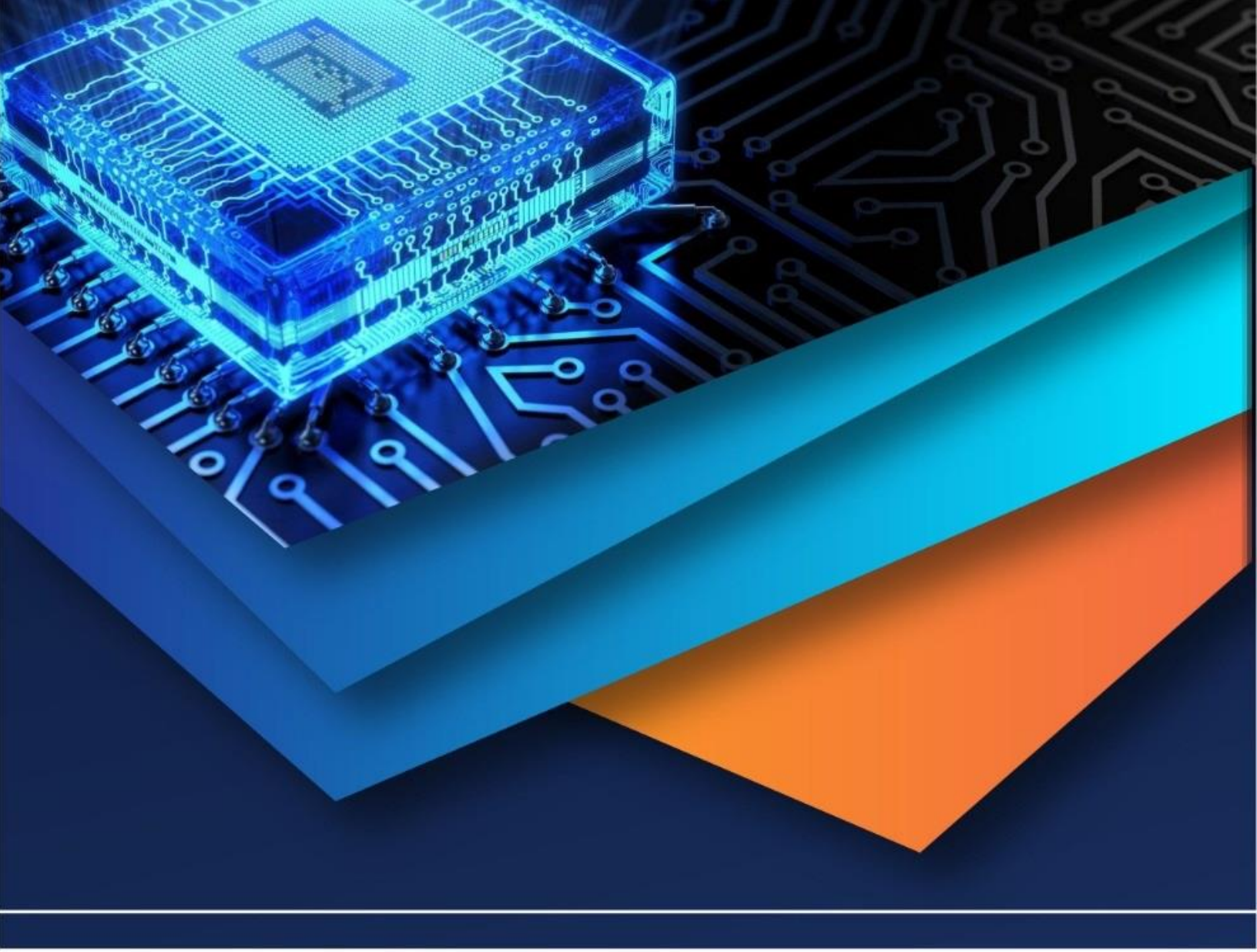

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