Nationality Detection Through Eye Analysis

BY

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

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APPROVAL

This Research Based Project titled **"Nationality Detection Through Eye Analysis"**, submitted by Shahib Islam Shoumik, ID: 201-15-14054 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on January 24, 2024.

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DECLARATION

We hereby declare that this project has been done by us under the supervision of **Md. Sazzadur Ahamed, Assistant Professor & Program Coordinator, and Department of CSE** at Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for the award of any degree or diploma.

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We would like to express our sincere gratitude and debt of gratitude to Md. Sazzadur Ahamed, Assistant Professor and Program Coordinator, CSE Department, Daffodil International University, Dhaka. Our supervisor has extensive knowledge and a strong interest in "Research Based Projects" and will use that knowledge to complete this project. It was made possible to finish this project by his unending patience, academic direction, persistent encouragement, continuous and ardent monitoring, constructive criticism, insightful counsel, reading numerous subpar versions and fixing them at every level.

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We express our gratitude to every student at Daffodil International University who participated in this discussion during the course of their studies.

Finally, we must acknowledge with due respect the constant support and patience of our parents.

ABSTRACT

Biometric identification has become increasingly popular as technology progresses, especially with regard to facial and ocular recognition. The study investigates the use of deep learning methods more especially, the VGG-19 model in the analysis of eye pictures with the goal of identifying nationality. Five different classes representing the perspectives of people from Bangladesh, Vietnam, South Korea, China, and South Korea are the subject of the study. The dataset is made up of a small range of carefully selected high resolution eye pictures that accurately depict each nationality. A deep learning model is trained to identify minute patterns and features in the eye pictures that differentiate people from the aforementioned ethnicities using the VGG-19 architecture. By means of extensive testing and optimization, our model attains a remarkable level of precision.

Keyword:

Biometric Identification, VGG-19, Eye Pictures, Nationality Detection, Image processing, Deep Learning

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CHAPTER 1

INTRODUCTION

1.1 Introduction

As artificial intelligence becomes more and more integrated with technology, biometric identification is becoming a vital part of many applications, from security to customized services. For example, facial recognition has garnered significant interest, but the study of more subtle aspects, such as eye analysis is still an emerging topic with great potential. This study explores the field of nationality detection using deep learning-based eye analysis and achieves an impressive 95.76% accuracy rate by using the VGG-19 model.

Globalization has caused geographical boundaries to become increasingly hazy, which has increased the need of accurately determining a person's nationality in a number of contexts, including identity verification, border control, and security protocols. Though facial recognition technology has advanced much in the past, much remains to be learned about the minuscule features that distinguish the human eye from other species. The eye's distinct characteristics and intricate patterns make it a suitable biometric identifier for determining nationality.

This study's five classes are representative of the populations of Bangladesh, Vietnam, South Korea, China, and South Korea. These countries were chosen to ensure a representative and diverse sample, which makes it possible to train and evaluate the VGG-19 model with accuracy. High-resolution eye photos from individuals of many nations are included in the carefully chosen selection, showcasing the diversity within each class.

To fully utilize deep learning, this study makes use of the VGG-19 model, which is well-known due to its efficacy in picture identification tasks. We want to identify minor patterns in the eye photos that function as trustworthy indicators of nationality by utilizing the model's capacity to extract complex features from photographs. The ultimate objective is to further the development of biometric identification methods, especially as they relate to the examination of eyes to detect nationality.

The approach used, the dataset's creation, the training and assessment procedures, and the practical consequences of the accuracy attained will all be covered in detail in the parts that follow in this work. The goal of this study is to offer a thorough understanding of the potential and limitations of nationality detection through eye analysis using the VGG-19 model by integrating the power of deep learning with the distinctive characteristics of the human eye.

1.2 Motivation

The concept of detecting nationality by eye analysis could be prompted by a number of variables, each with its own set of possible applications and repercussions. Many academics have created and examined various methods for recognizing human faces from different countries. Nowadays, automatic facial recognition from facial expressions has become a demanding domain of computer vision, but I just pay attention to the eyes of five distinct countries: Australia, Bangladesh, China, South Korea, and Vietnam. As a result, I suggested a customized model of deep neural network architecture for the eye. It uses eye pictures as input and then classifies them to determine nationality.

1.3 Objective

Using precise retinal scanning and accurate access to all required data, my primary goal is to establish nationality through eye analysis more easily. We can then make the appropriate choice. Depending on the purpose and circumstances, establishing nationality detection through ocular analysis may have several goals. The development of such technology may be motivated by the following broad goals:

1. Enhance Security Measures
2. Streamline Identity Verification
3. Customize User Experiences
4. Optimize Public Services

5. Support Humanitarian Efforts
6. Contribute to Research and Demographic Studies
7. Improve Marketing and Advertising Strategies
8. Preserve Cultural Heritage

These are my key goals, which I hope to achieve.

1.4 Expected Outcome

• Identifying nationalities by classification.

• Using the Keras API, we will train the deep learning model with various pre-trained models, VGG19.

• Finally, assess and compare the accuracy of the offered algorithms.

• Finally, with this technology, we will be able to easily detect nationalities.

I anticipate these outcomes at the conclusion of this research.

1.5 Report Layout

The report begins with preliminary sections, including Approval, Board of Examiners, Declaration, Acknowledgment, and Abstract. Chapter 1, titled Introduction, sets the stage by introducing the research, its motivation, objectives, expected outcomes, and the overall layout of the report. Chapter 2 delves into the Background, covering key terminologies, related works, research summaries, and challenges in the field. The third chapter, Research Methodology, details the deep learning architecture, convolutional neural network, proposed models, datasets, data preprocessing, model installation, and specific components like nationality detection and recognition. Chapter 4 presents the Results and Analysis, including an introduction, model loss analysis, and final accuracy assessment. Moving forward, Chapter 5 discusses the Conclusion and Future Scope, summarizing key findings,

presenting notifications of accepted papers, outlining future work and development, and addressing limitations. The report is supplemented by a References section listing the cited sources and two appendices: List of Figures, containing graphical representations such as work flowcharts, model architectures, and notifications; and List of Tables, providing tabular information on related studies and accuracy metrics for different countries. The comprehensive layout ensures a logical flow and easy navigation for readers through the various aspects of the research.

CHAPTER 2

Background

2.1 Terminologies

The aim of this work is to classify nationalities. To accomplish this, a nationality dataset is created by collecting subject-specific images from the Internet. Then some pre-processing and data cleaning is done on the collected images. Once the dataset is prepared, supervised models are applied to solve the nationality classification problem. CNN was selected for supervised learning because of its outstanding performance in solving nationality classification problems.

2.2 Related Works

Technology known as facial recognition may match a person's face in a digital photo or videotape frame to a facial database. This disquisition focuses on creating a music system of recommendations that uses recognition of faces ways to gauge the stoner's emotional state. The algorithm used is OpenCV, which outperforms being systems. The proposed process has both advantages and disadvantages.[1]

A fresh approach to intelligent monitoring is developed to determine gender and nation from anterior picture campaigners grounded on deep literacy. Face recognition is determined by several factors, similar to picture quality, lighting, angle of gyration, obstruction, and facial expression. Image discovery is pivotal to ascertain the seeker image's nation, gender, and face shape. The model can tell the country by looking at a picture of a person's face and can be utilized by models, celebrities, actors, and other common people.[2]

For precise identification and detection in facial recognition, deep learning techniques are employed. It can be reduced to three main goals: emotion classification, face detection, and recognition. Computer vision algorithms are implemented using Python programming,

datasets, and the Open CV package. To determine each face's underlying emotions and physiological changes, an experiment was carried out.[3]

Here, a revolutionary deep architecture that combines a novel deep neural network, PCA, and combined Bayesian framework is suggested to improve the accuracy of multi-view human face recognition. Using the CAS-PEAL dataset, experiments revealed a 98.52% face recognition performance.[4]

In biometrics, face recognition is a key topic, however in unrestricted conditions, its accuracy drastically decreases. In order to overcome this difficulty, we suggested a manual technique centered on identifying significant areas within the facial picture. While ImageNet pre-trained models using LinearSVC boosted the accuracy rate to 100%, deep learning models were unable to attain a high accuracy rate.[5]

In order to identify human facial expressions from static photos, this study investigates the usage of deep neural networks or convolutional neural networks. Compared to previous models, the network's training yielded notable outcomes using a network suggested with the aid of ResNet50.[6]

Because it minimizes human intervention and can recognize visitors from many angles, deep learning is crucial for computer vision applications. The noise component model of a CNN-based multi-feature fusion face recognition model had the greatest recognition rate in tests.[7]

The usage of a recognizable iconic area, a disproportionate performance cost when stimulants are presented upside down, and a decrease in delicacy for faces from races the party is less familiar with are some of the unique behavioral signatures of fatal face recognition. We employed deep convolutional neural networks (CNNs) to investigate the notion that these autographs influence facial recognition optimization.[8]

In this work, a unique methodology based on key point coordinating concepts is used to facial recognition. The outcomes demonstrate that when training CNNs on datasets with missing target values, the suggested masked objective function is more dependable,

resilient, and effective. In order to prevent overfitting, utilizing enhanced data in the training set increases accuracy by 40%.[9]

Women have a poorer face recognition delicacy because to the combination of real and fraudulent distributions. This miracle holds true for datasets including Asian, Caucasian, and African-American faces. The distinction in delicacy is still present when employing solely womanly photos devoid of makeup, for image subgroups with neutral expression ratings, and when pitch angle is almost at zero.[10]

For criminal detectives, face recognition is a useful tool, but it takes a lot of computing power and computation time. In this work, a regression model is developed to measure performance and the speed-accuracy tradeoff of three widely used deep-learning-based face detectors is evaluated. The optimal speed-accuracy tradeoff is obtained when photos are shrunk to 50% and 25% of their original size, according to experimental results.[11]

To solve incorrect frontalization, the DAFF system was proposed. An encoder-decoder model is injected with the 3D spatial prior of the input face, and a new ideal to focus on the target's important parts is suggested. Trials conducted over a large scale demonstrate that DAFF performs competitively and frontally in a suitable manner.[12]

Real-world problems are broken down using AI deep literacy, machine literacy, and neural networks. Real and fake face detection models are induced using deep literacy; the ResNet50 model has 100% training, 99.18 percent confirmation, training loss 0.0003, confirmation loss 0.0265, and testing delicacy of 99 percent.[13]

By using four CNNs and three CNN visualization techniques to show the areas of the face picture that are stressed by each face recognition method, deep learning has enhanced face recognition performance. The tests demonstrate which areas of the face image are highlighted by each face recognition algorithm.[14] The use of face masks to stop the spread of the COVID-19 virus is examined in this study. It enables the precise identification of individuals wearing face masks using a ResNet-50 based architecture, which can be included into already-existing face recognition applications for security verification.[15]

The ability of deep literacy facial recognition algorithms to distinguish different stock faces was estimated. The findings indicated that FaceNet is stylish for a bracket grounded on the nose, whereas VGGFace is stylish for a bracket grounded on the entire anterior face and eyes.[16]

The rising rate of crime has brought a lot of attention to the subject of facial recognition. In order to assess the models' performance on a real-time dataset and determine if they can correctly predict a face, this study compares two face recognition algorithms: classical and deep learning.[17]

The effectiveness of deep literacy styles with noise-ground data addition for disguise steady face recognition (DIFR) was examined in this work. In order to attain an average delicacy of 98.19 with an average prosecution time of 0.32 seconds, four distinct pre-trained 2D CNNs were tested.[18]

Convolutional neural networks (CNNs) have been utilized to address facial recognition problems using deep learning. This work proposes a CNN that creates a discriminative feature through metric learning, based on a pre-trained VGG Face with 97% accuracy.[19]

With an overall top-1 accuracy of over 90%, deep transfer learning from face recognition can be used to computer-aided facial diagnosis on a variety of disorders. Because datasets are typically small and private, disease screening and detection can be done in an inexpensive and non-invasive manner.[20]

"Face Recognition using DNN with LivenessNet" proposes a method based on deep neural networks for liveness. Face recognition is a common idea utilized in surveillance cameras for security purposes. It is fast and effective in producing accurate results with face spoofing and can be applied to security and safety scenarios.[21]

With the use of Yonsei University's Computational Intelligence Photography Lab's "Real and Fake Face discovery" dataset, this investigation seeks to assess how various deep literacy methods function. While VGG-16 demonstrated the fashionable test set delicacy

utilizing a smaller number of ages, VGG models provided the stylish training delicacy of 91.97 and 92.09.[22]

Face recognition performance has been enhanced by deep learning; two well-known models—Lightened CNN and VGG-Face—that can withstand localization errors and misalignment are examined in this study.[23]

A common usage for object detection is face recognition, which is employed in surveillance, fraud detection, access control, authentication, and device unlocking. The goal of this research is to increase the accuracy of multi-view face detection using a Deep Neural Network (DNN) based method.[24]

Four components comprise the proposed innovative facial expression identification system: face detection, a convolutional neural network architecture based on deep learning, data augmentation approaches, and a trade-off between data augmentation and deep learning features. Comprehensive experimental outcomes have been proven references. [25]

This paper explores how transfer literacy approaches can be used to increase the accuracy of facial recognition using deep CNNs. Trials using the Labeled Faces in the Wild LFW dataset showed that fine-tuning pre-trained models significantly enhances delicacy when compared to training from scratch. Although features birth yields promising outcomes, it is not as effective as optimizing pre-trained models.[26]

2.3 Research Summary

In this paper, we showed how to use eye analysis to determine ethnicity. In addition to data that we personally gathered, we also used Google and its websites. We develop a model that uses features and color of the eyes to identify different nations. To address this difficulty, we use the Keras API framework to construct a deep-learning network. An automatic detection method based on deep learning is used to achieve this. Additionally, we employ many deep learning techniques to identify eyes in images. Each structure is described in detail in the paper, and the findings show which architecture is best and can

produce the highest detection accuracy. In addition, we evaluate deep-learning architectures against datasets gathered for our experiment on nationality assessment, which comprised 1789 eye images from five different nations. the Republic of Korea, China, Bangladesh, Australia and Vietnam.

2.4 Challenges

- Too little information to work with.
- There isn't much training data available.
- Variable training outcomes.
- Low-quality data.

CHAPTER 3

Research Methodology

3.1 Deep Learning Architecture

One subset of artificial intelligence (AI) is deep learning uses for neural networks to replicate human behavior. These multi-layered algorithms assess data using a logical structure to reach human-like conclusions. Deep learning employs a variety of architectures and approaches, including as input, hidden, and output layers. The more data accessible, the more advanced the deep learning architectures and methodologies.

3.2 Convolutional Neural Network

Neural networks with convolutions are utilized in a variety of applications, including natural language processing, video analysis, image processing, and recognition. They process input photos, sort things, and recognize them. These networks consist of hidden layers, input, and output with the majority consisting of convolutional layers. The control layer directs signal transitions, and the output is compressed before being forwarded to the fully linked layer for categorization.

3. 3 Deep Learning Proposed Model

The nationality information used in this study was gathered manually and by the collection of subject-specific photos from the Internet. Various supervised deep-learning techniques are employed in the construction of the suggested categorization models. As the major researcher for that topic, we wish to evaluate their performance in identifying the ethnicities that were being considered and determining which one was the best. Every one of these models uses a different combination of CNN. Because of VGG19's greater accuracy rate, we chose it.

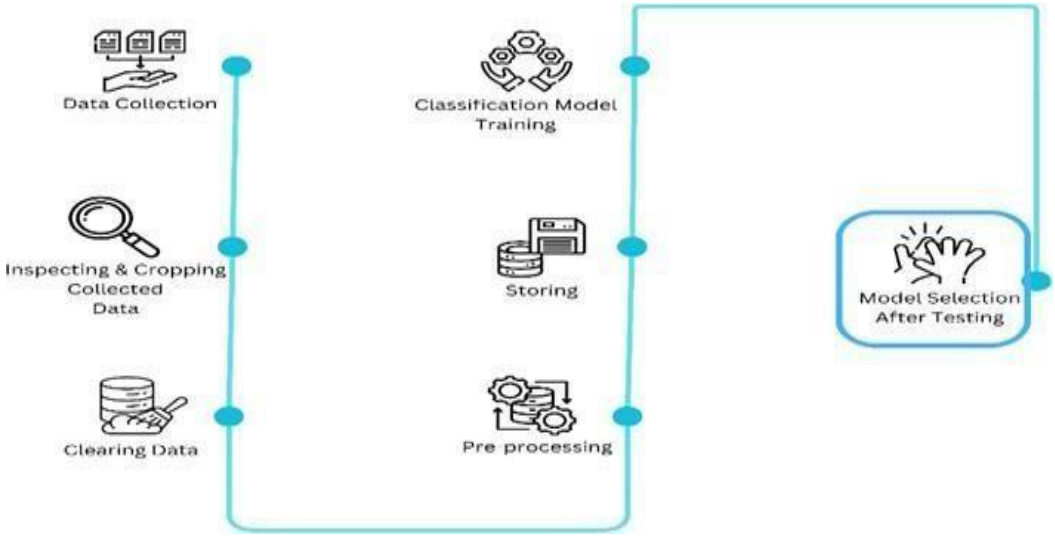


Figure – 3.1 Work Flowchart

3.4 Datasets

This world is home to a vast number of people and countries. Human eyes and features are comparable in terms of color and shape. For our experiment to determine nationality, we have collected 1789 eye images from five different nations. South Korea, Bangladesh, Australia, China, and Vietnam are such countries.

3.5 Data Preprocessing

Image preprocessing is a critical step in optimizing the effects of image classification. Since the convolution neural network learning method is used to monitor and regulate how our activity is carried out in machine learning, we must label the data in the image preparation step. The data was then reduced in size.

3.6 Model Installation

This experiment is based on the Vgg-19 model from the Keras platform. The system has a 64-bit operating system, an Intel i3 processor working at 3.70 GHz, and 8 GB of RAM.

The first step is to download Keras. We then put the VGG-19 model into practice. We also used the transfer learning strategy, which maintains the parameters of the preceding layer, to remove the last layer of the VGG-19 model and retrain a final layer.

3.7 Proposed Model

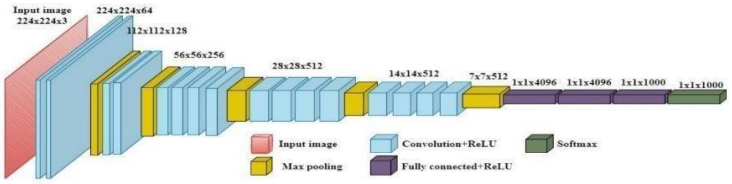


Figure 3.2: Vgg-19 Model

The pre-prepared CNN model that Simonyan and Zisserman at the College of Oxford, UK, proposed in the middle of 2014 is known by the trade name VGG network. The ImageNet ILSVRC dataset, which contains 1.3 million images and 1000 classes of which 100,000 were used for preparation and 50,000 for approval was used to create VGG (Visual Math Gathering). Compared to other conditions of human expressions models, VGG-19, a version of VGG designs, has consistently achieved better execution thanks to its 19 deeply related layers. With its highly associated convolutional and fully associated layers, the model allows for improved element extraction as well as the use of Maxpooling (instead of regular pooling) to downsample earlier order data using SoftMax enactment capabilities.

3.8 Nationality detection and classification

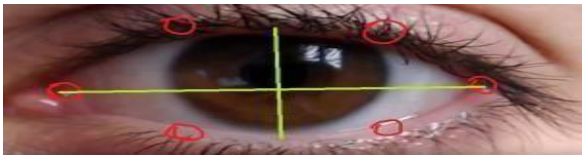


Figure-3.3: Eye detection and classification.

We will discuss the use of ocular analysis for nationality detection in this research. Not only is face detection important, but eye detection is as well. In order to determine whether or not the photos are human, we will be employing manually cropped images and control points. The majority of the time, eye cropping will be used, and obtaining a feature point

might be quite challenging. From began we'll be leveling, or filtering all of our data. After that, we'll produce a dataset in which we keep all of the data. Every piece of data that we produce will have the same height and breadth. After using the trained model to train our dataset, we'll input it into the classification model. Lastly, the CNN model will be employed. We trained the VGG-19 model 50 times. To get the desired result, the program is finally executed, the history is set, and the model is compiled.

3.9 Recognizing Nationality

A person's nationality is a noteworthy distinguishing characteristic that is used for important verification in every nation. The approach involved in recognizing identification is the size and separation of the face that are not totally settled by various boundaries, such as picture quality and output iris. Consequently, before fully converting the image to actual information, we need first see an eye in it. The up and coming artist's orientation, facial shape, and essence may not have fully settled in. Finally, we will return the result, which will be based on the envelope established by our information base. When we were conducting estimation testing, there were significant differences between the photos taken with these leveling directories. The information picture should be the eye picture since it has smooth light and no pivot point. We provide an outline of our model and perform a prepared test on it. Finally, make a demolition grid with this precision. It truly aids in identifying ethnicity and similarities between people from other countries; hence, it should not be used as the infographic's pivot point. We provide an outline of our model and perform a prepared test on it. Finally, make a demolition grid with this precision. It truly aids in the identification of ethnicity and similarities between people from various countries.

Figure-3.4: Vietnamese Eyes

3.10 Study with Other Works

Table-3.1: Related Study

Papers Name	Year	Algorithms / Methods / Model
1.Bangla Song Suggestion Using Face Detection	2022	CNN, KNN,SVM, OpenCV
2.Nationality Detection using Deep Learning	2022	CNN
3. A real time face emotion classification andrecognition using deep learning model	2020	VGG-16 Face, CNN
4.Multi-view face recognition using deep neural networks	2020	CNN,PCA algorithm, Bayesian method
5.New Approaches for AutomaticFace Recognition Based on Deep Learning Models and Local Handcrafted ALTP	2021	ALEXNET-v2, VGG16, ResNet50,Handcraft model, Xception, Inception-v3
6. Human Facial Emotion Detection Using Deep Learning	2022	MTCNN,CNN, Alex-Net, Vgg-16, ResNet50
7. Deblurring Method of Face Recognition AI Technology Based on Deep Learning	2022	ReLU function model, PCA, LDA, LPP,CNN,KNN
8.Behavioral signatures of face perception emerge in deep neural networks optimized for face recognition	2023	CNN, VGG16 architecture
9. Methods to Identify Facial Detection In Deep Learning Through The Use	2021	CNN,ECNN

Of Real-Time Training Datasets Management		
10. Analysis of Gender Inequality in Face Recognition Accuracy	2020	CNN, MS1MV2, VGGFace2,
11. Assessment and Estimation of Face Detection Performance Based on Deep Learning for Forensic Applications	2020	linear regression models,CNN, Tensorflow, PyramidBox and DSFD methods,MTCNN, GLMs
12. MULTI-VIEW FACE RECOGNITION USING DEEP ATTENTION-BASED FACE FRONTALIZATION	2021	DAFF methods, 3D morphable model
13. Classification of Real and Fake Human Faces Using Deep Learning	2022	VGG16, ResNet50, Mobile-Net, and InceptionV3
14. A Comprehensive Study of Face Recognition Using Deep Learning	2021	AlexNet, EfficientNet-B1, ResNet-34 model,CNN
15. Masked Face Recognition using ResNet-50	2021	ResNet-50
16. A Study of Deep Learning-Based Face Recognition Models for Sibling Identification	2021	FaceNet; VGGFace; VGG16; VGG19
17. Comparative Analysis of Human Face Recognition by Traditional Methods and Deep Learning in	2020	CNN,LBPH algorithm Viola jonas metod, MTCNN Algorithm, FaceNet model

Real-Time Environment		
18. An automated and efficient convolutional architecture for disguise-invariant face recognition using noise-based data augmentation and deep transfer learning	2022	CNN,DIFR methods, Viola Jones + Resnet-50
19. A Proposed Framework: Face Recognition With Deep Learning	2020	Tensorflow, Autoencode, Vector Similarity method
20. Deep Facial Diagnosis: Deep Transfer Learning From Face Recognition to Facial Diagnosis	2020	CNN
21. Face Recognition using Deep Neural Network with "LivenessNet"	2020	Liveness.net,CNN
22. Forged Face Detection using ELA and Deep Learning Techniques	2021	CNN, ELA, Forgery, VGG, ResNet-50, InceptionV3, ResNet-50
23. Deep Learning Based Representation for Face Recognition	2020	CNN
24. Frontal and Non-Frontal Face Detection Using Deep Neural Networks (DNN)	2021	DNN
25.Facial expression recognition with trade-ofs between data	2020	CNN, the state-of-the-art methods

augmentation and deep learning features		
26.Facial recognition using transfer learning in the deep Cnn	2023	CNN, ResNet-50,VGG-16

CHAPTER 4

Result & Analysis

4.1 Introduction

Frontal face images were taken from the data after it was collected and used in auto-crop training. There are 20,225,096 total parameters in our model, of which 200,712 are trainable and 20,024,384 are not. We trained our 32-batch data 50 times. A few results are mentioned below in this case. Here, displaying a really competent technique. We understand that accuracy is defined as the percentage of all data points that were properly predicted. Our initial figure makes it clear that we didn't start out with very good accuracy. Our training has given it the highest accuracy to date. A loss results from a prediction that is off. Gradually, accuracy rises as loss falls.

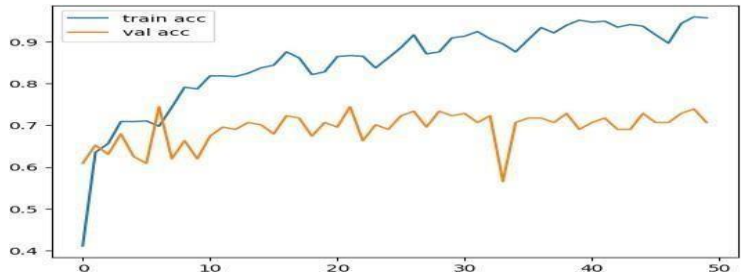


Figure-4.1: Model Accuracy

4.2 Model Loss

The accuracy rate is seen in the figure to be increasing with each training phase. After that, we achieve a satisfying 70.65% Val precision (esteem exactness) and up to 95.76% accuracy, which is actually prepared exactness.The accuracy rate is seen in the figure to be increasing with each training phase. After that, we achieve a satisfying 70.65% Val precision (esteem exactness) and up to 95.76% accuracy, which is actually prepared exactness.

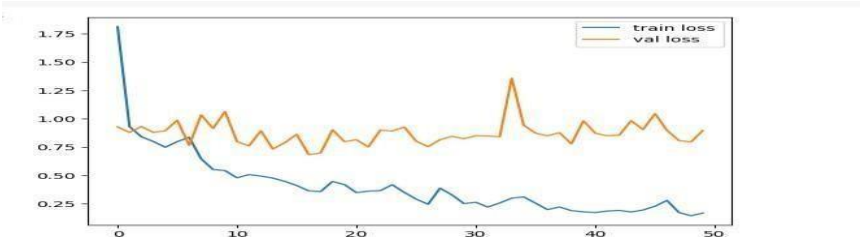


Figure-4.2: Model Loss

4.3 Final Accuracy

The graph of our loss-v-loss (validation loss) function shows how the loss is decreasing, as seen in the figure. which works out to 16.82%. After our data has been trained, the validation loss is computed on the v-set (validation set).

Table-4.1: The Accuracy of five country & Final Accuracy

Country	Accuracy
Australia	96%
Bangladesh	97%
China	55%
South Korea	93%
Vietnam	51%
Macro Average	78%

Five countries' accuracy is displayed in this table. Australia's accuracy is 96%, Bangladesh's 97%, China's 55%, South Korea's 93%, Vietnam's 51%, and the ultimate accuracy is 78% for our dataset.

CHAPTER 5

CONCLUSION AND FUTURE SCOPE

5.1 Discussion and Conclusion

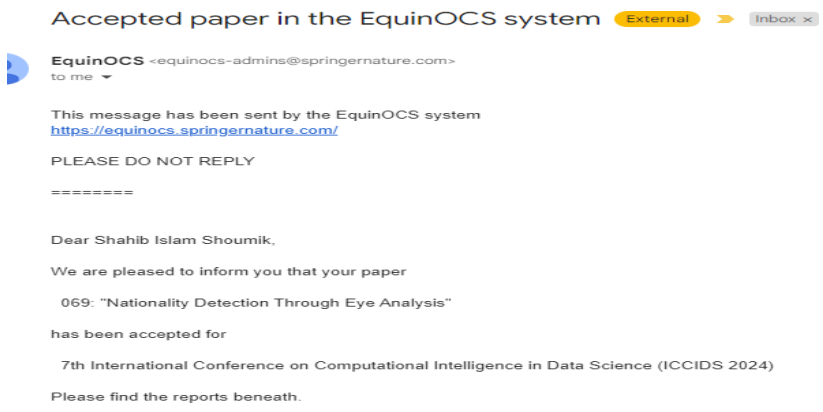
As of the Keras stage, we have been using the VGG-19 model. To maximize this model and improve our accuracy, our next task will be to investigate and advocate for more potent models.Using our dataset, we apply CNN technique in this work to discern five different nations' identities in light of the VGG-19 model of Keras stage. We additionally obtain a 95.76% accuracy rate for the model. We should be able to improve our precision in the not too distant future by refining our approach.

5.2 International Conference Acceptance Notification

Dear Authors,

Congratulations! We are delighted to inform you that your paper has been accepted for presentation in the 7th International Conference on Computational Intelligence in Data Science (ICCIDS 2024).

The conference received around 320 submissions this year, and we are able to accept only 15% of them. We enclose the reviews of your paper below. It is very important that you try to follow the suggestions stated by the reviewers to further revise your paper when preparing your camera-ready manuscript.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Dear Shahib Islam Shoumik,

We are pleased to inform you that your paper

069: "Nationality Detection Through Eye Analysis"

has been accepted for

7th International Conference on Computational Intelligence in Data Science (ICCIDS 2024)

Please find the reports beneath.

Figure 5.1: Accepted paper in the EquinOCS system

5.3 Future work and Further Development

The successful implementation of nationality detection through eye analysis using the Vgg19 model with a remarkable accuracy of 95.76% opens up promising avenues for future research in the field of biometric identification and machine learning. The robust performance of the Vgg19 model suggests that further refinement and optimization could enhance accuracy even more. Future investigations could explore the integration of additional deep learning architectures or ensembling techniques to improve the model's overall performance. Moreover, expanding the dataset to include a more diverse and extensive range of eye images from various ethnicities and demographics would contribute to a more comprehensive and inclusive model. Additionally, exploring the interpretability of the model and understanding the features learned by the neural network during the classification process could provide valuable insights into the underlying patterns contributing to nationality detection through eye analysis. The application of transfer learning techniques or the exploration of novel pre-processing methods could further enhance the model's generalizability across different datasets and real-world scenarios. Finally, considering ethical considerations and potential biases in the dataset is crucial, and future research should address these aspects to ensure the fair and responsible deployment of such technology in practical applications.

5.4 Limitations

- Just discuss about nationality through eye analysis
- Very old VGG-19 is chosen though there are advanced deep learning networks for first unique paper
- No comparison of results with other DL networks
- There is no inference for China and Vietnam accuracy.
- Just Using One Model

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