THE American Journal of Humanities and Social Sciences Research (THE AJHSSR) 2024
E-ISSN: 2581-8868
Volume-07, Issue-02, pp-12-28
www.theajhssr.com Crossref DOI: https://doi.org/10.56805/ajhssr
Research Paper **Open Access**

Pigeon Breed Identification in Real-Time Using Local Binary Pattern and Support Vector Machine

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ABSTRACT

Purpose: The main goal of this study is to tackle a difficult computer science issue about fancy pigeon visual recognition throughout the purchasing process. Inspired by new methods for vision-based classification, the research attempts to further the fundamental concepts of Deep Learning, Computer Vision, and Machine Learning. The goal is to present a novel way, diverging from earlier approaches primarily concentrating on body shapes for breed detection and extensively dependent on Convolutional Neural Network (CNN) technology. By utilizing supervised Support Vector Machine (SVM) and Local Binary Pattern (LBP) models and combining different pigeon body and wing patterns, the objective is to improve the accuracy of pigeon recognition.

Design and methodology: The study uses a cutting-edge strategy to increase pigeon detection accuracy using supervised SVM and LBP models. To train and evaluate the models, the approach uses photos to capture various pigeon body and wing patterns. To overcome the lack of datasets from previous models, the study generates its dataset and uses traditional CNN for comparison analysis. Detection performance is improved by focusing on two pigeon breeds specifically instead of the traditional four-class categorization. LBP for feature extraction and SVM for classification are systematically included in the design.

Findings: The results show that the suggested model—which combines LBP and SVM—performs better at pigeon detection than the traditional CNN model. With a noteworthy 95% accuracy for 120 photos and a remarkable 97.3% accuracy for 250 photos, the outcomes demonstrate how effective the new method is in raising the bar for pigeon identification accuracy. According to the study, the approach is better at capturing patterns and wings, such as those of Checker and Blue Bar (Rock dove), than earlier models mostly concentrating on body features.

Practical Implications: Practically, the research has implications for the field of computer vision and animal identification, showcasing a more effective method for identifying pigeon breeds, particularly those with distinctive wing and body patterns. The proposed system could have applications in diverse domains requiring accurate and efficient visual categorization, such as wildlife monitoring, agricultural practices, or even pet management.

In Conclusion: This study offers a fresh and practical method for identifying elegant pigeons visually while making a purchase. Using SVM and LBP models, the study's innovative technique deviates from typical methodologies and shows greater accuracy, particularly in capturing unusual patterns and wings. As a useful substitute for precise and effective pigeon detection, the results advance the domains of computer science, machine learning, and computer vision. The work provides possibilities for more research in vision-based categorization and animal identification and emphasizes the usefulness of the suggested approach.

KEYWORDS: Vision-based categorization, Machine Learning, Computer Vision, Deep Learning, Fancy Pigeon Identification, Convolutional Neural Network (CNN), Support Vector Machine (SVM), Local Binary Pattern (LBP), Breed Recognition, Pigeon Detection Accuracy.

INTRODUCTION

Chapter 1

In Bangladesh, pigeons farming is one of the most popular businesses because it's very easy and simple to start and needed less investment to earn more profit. But it's very difficult to select and find good pigeon's breed. However, most of the people are having interest to raise and pet pigeons in their home because it is required less facilities and less efforts. So, anyone can get involved in pigeons farming who is hav- ing good amount of free time and love for birds because pigeons can easily raise at our rooftop or balconies. There are two major types of pigeons i.e., Breeds for Meat Production and Breeds for Beauty and Recreational Purpose. But it's quite difficult to distinguish the good quality of pigeon's breads through human eye. So, we have come to bring image processing to improve the performance of fining of good quality of pigeons breeds using SVM and LBP supervised models.

1.1 Motivations

Human relation with pigeons goes back to an ancient time when people keep domes- tic pigeons for various needs. The Rock Dove is the ancestor and from which, we get the first subspecies of pigeon. It is the world's oldest domesticated bird. Pigeon's con- tribution to humanity has great importance. However, people in Bangladesh have a great interest in pigeon. They are popular for food, trading, racing, or as a pet. Pi- geon has been considered delicious by many, especially the squab Bangladesh has huge business practice for pigeon farming as a food source as well as racing. Some people breed pigeons for fun. Especially because of the genome of pigeons and the different breeds which they create from crossbreeding different types of pigeons to get completely new types of pigeons. All the different breeds of pigeon come from a single ancestor called "the Rock Dove". Pigeon breeds can be categorized based on their color, pattern, and modifier gene. Every pigeon phenotype consists of color, a pattern, and modifier genes. Phenotype is the way the bird looks as a whole when color and pattern are the categories of the gene. So, the fancy pigeon breeders often breed pigeons for their looks. Using, Figure 1.1. We want to detect different breeds of pigeon.

Figure 1.1: Blue bar pigeon

During the lockdown pigeon breeding has increased. People raise pigeons that is shown in Figure 1.2 and sell them in the market. We have studied lots of research paper and find out Support vector machine is one of the supervised learning models to analyze data used for classification and regression analysis. Besides, Local Binary

Figure 1.2: Image of Pigeon Breeding in Bangladesh

Pattern (LBP) is also one of efficient texture operator to labels the pixels of an image by thresholding the neighborhood of each pixel and considers the result as a binary number. So, we used Support Vector Machine (SVN) to classify our dataset and LBP to extract the features.

1.2 Aims and Objectives

The main objective of the project are:

- To accurately detect texture of pigeon breed based on their pattern.
- Pigeon breed detection using texture classification with Local Binary Pattern(LBP) and Support Vector Machine(SVM).
- Evaluate the performance of the proposed approach.

1.3 Problem Domain

People of different ages are preferred to keep breeding pigeons in their homes or commercially. Many times, people order pigeons from many other countries, local and online shop. From the commercial perspective, selling adult pigeons and their squab is a great source of income for poor communities. It can be a great way of defeating poverty. But new farmers are falling for scams in pigeon farming. These happen because some breeds of pigeons look like similar through human eyes when they look. So, recognizing a specific breed of pigeon can be a challenging task. To solve this problem, we want to help pigeon farmers to identify pigeon breeds easily using AI technology. Real-time breed detection is quite difficult because of image different angles and position that can be hard for a machine to learn. Pigeons are in different movement position that captured using Redme 7 smart phone and named as Pigeon A, Pigeon B and Pigeon C in Figure 1.3.

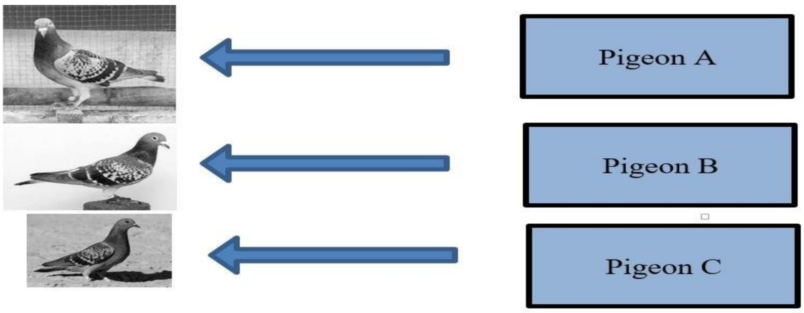

Figure 1.3: Different position of Pigeon image

A detection system could help people who can't understand the difference be- tween different types of pigeon breeds and also to help farmers in smart farming. We have worked with two types of breeds Checker and Blue Bar those are shown in Figure 1.4 and Figure 1.1
Figure 1.4: Checker

1.3.1 Expected Outcome

We are expecting to figure out the more accuracy for detecting pigeon breeds using different types of supervised models through image processing in real time.

Figure 1.5: Blue Bar

1.4 Research Contribution

In Pigeon breed detection using CNN computer Vision, Machine Learning and Deep Learning has been already used to detect breed such as (Rock dove, Fantail, Jacobin) [1]. We are using method LBP to extract features for images of pigeon breeds [2]. However, we have used two classifiers i.e., LBP and SVM to compare the results with previous results. We have studied some project papers but was unable to get any other work of using different algorithms except CNN [1]. So, we are using SVM and LBP algorithms and also created our own data-set because we can not find data-set from any side or [1].

Only one solution has made for pigeon breed detection in the previous research. So, our goal is to make this system more standard and different from previous one which was suggested in [1]. After studying we have come to know about Deep learn- ing and Supervised learning. By using the following concepts, our model looks stan- dard and gives better result compared to its counterpart like CNN using our dataset.

1.5 Thesis Outline

- **Chapter 2:** Literature review where we will be discussing the related work, and existing system with major drawback.
- **Chapter- 3:** Design and Implementation includes the proposed system method and how it works.
- **Chapter- 4:** Evaluation of the system describes the outcome and comparison between these systems.
- **Chapter- 5:** The conclusion shows the overall performance of our suggested system and the drawbacks of it.

1.6 Conclusion

Here in the first chapter, a brief description of the aim, introduction, motivations, problem domain, and objective are discussed and also covered some research ques- tions which were related to this research. Our topic for the next chapter is back- ground study and related research work. We put up and highlighted the main topics.

LITERATURE REVIEW

Chapter 2

2.1 Introduction

Already there exists so much research work in image classification and Deep learn- ing. We will talk about those literatures and the algorithm they used as well as the algorithms which we used in this research.

2.2 Image processing

Image processing is the classification or analysis and manipulation of an image to improve its quality or detect object using Deep learning. By using image dataset which consist of images from real world for which input is an image, such as a photo- graph images, the output of can be characteristics or parameters related to the image quality. Most image processing techniques involve image such as 2D and 3D apply- ing supervised learning method, we extract and train machine about those objects in Figure 2.1.

2.3 Local Binary Pattern Classifier (LBP)

In this project LBP classifier was used to detect Pigeon breeds [1]. It is a computer vision visual descriptor. This is an effective feature to analyze the local pixels around a point. Threshold is set to create a 0 or 1 for each location. Achieving gray Scale invariance. After the combinations create a binary pattern which is later translated into a decimal output.

123	65	196
14	120	150
8	184	147

1	0	1
0	120	1
0	1	1

Figure 2.1: LBP calculation

2.4 Convolutional Neural Network (CNN)

The Convolutional Neural Network is a Deep Learning algorithm, take in an input image, assign importance to various objects in the image and able to differentiate one from the other. Uses human perception of recognizing things. Learns attentively using spatial hierarchies futures through back propagation. Bloacks such as convo- lution layers, pooling layers, fully connected layers are used. It is used for many task in AI [1] [3].

2.5 Support Vector Machine (SVM)

SVM is one type of supervised learning algorithm for classification and regression to classify data into different classes and also trains on a set of label data. Besides, SVM is drawn a decision boundary which is used as a hyperplane between any two classes in order to separate them or classify them [4].

2.6 Comparison of Different Methods

When studying for the best model in image classification we came across some well- known research topics and methods. Computer image classification has been pop- ular mainly for its automation and many other benefits. One of those methods is, LBP, which has an effective feature for texture classification by Timo Ojala. A score of LBP result of joint operators 80.4 % (2002) [2]. There was always a new LBP. Af- ter decades of new ideas, (2015) the field of LBP [5]. Where generic methodology to compute a scale- and orientation-adaptive extension were used. Their results were based on the CURET image. They compared with SOA-LBP [5]. In the last step ro- tation and, scale-invariant features are combined in a multi-resolution representa- tion [5]. Local Concave-and-Convex Micro-Structure Patterns for texture were intro- duced (2017) with (with 3x3) neighbors [6]. Triplet with center pixel with distinct fea- ture [6]. LCvMSP and LCxMSP descriptors are more insensitive to noise [6]. Image data of multiple types were classified using the sota Machine Learning (ML) algo- rithm called Support Vector Machine. Giles M. Foody (2004) compared with other classifiers [4]. Where he was able to get high accuracy 93.75 % compared against Discriminant Analysis (DA), Decision Tree (DT) and feed-forward Neural Network (NN). Till then the image classification got varieties of approaches to classify. Since the dataset was increasing in large volumes. Which enabled Convolutional Neural Network (CNN) to rise above. Leading to CNN outperforming everyone. Eight-layer CNN was proposed by Krizhevsky et al, were five layers were convolutional and three layers of dense layers [7]. They used a large sum of image data and it can perform well in CNN. of neural network architectures' true capacity. After that many classifi- cations of animal and plant breeds were introduced. Same with Bangladesh mangos breeds detection. Where they use adam optimizer with 3 CNN models [3]. Dogs breed used the Principle Component Analysis (PCA) for faster processing time than conventional methods [8]. bird species from images pose normalization on fine- grained classification [9]. Closely related to our Pigeon breed detection. Maksudur Rahman et al, did pigeon breed detection with Rock pigeons using CNN. Where they got 95.33 % in testing [1]. Their research work inspired us to use a combination of LBP and SVM. We believe it could be better alternative approach. We have given graph of those discussed Algorithms.

2.7 Comparison of Different Methods

We have shown the comparisons of different types of classifiers i.e., LBP, SVM, and CNN based on Algorithms types, techniques and accuracy in Table 2.1

Table 2.1: Comparison of Different Work Methods

Different classi- fier	**Algorithm**	**Technique**	**Results**
LBP [2]	Rotation Invari- ant Texture Clas- sification	Rotation and illu- minant invariant texture classifica- tion	80.40 %
Support Vector Machine [4]	SVMs	First SVM	93.75 %.
CNN	CNN	4 Convolutional lay- ers [8], dataset pi- geons	95.33% Test
PCA [8]	PCA	Unsupervised Learning Algorithm	88.00%
CNN [3]	CNN	Noise reduced	92.80%.

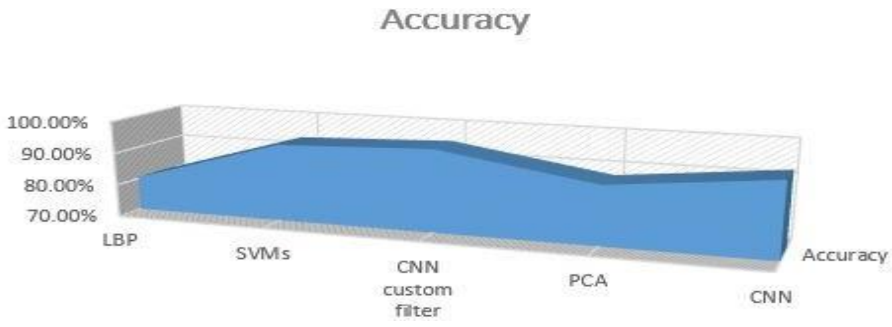

Figure 2.2: 3D-area graph of related topics

2.8 Comparative analysis

The main goal of this project is to solve the problem of recognition of pigeon breeds. There are many image classification research works that exist in less amount for pi-geon breed detection. From this point of view our project goes in line of research which has same values in 2D and 3D representation those are shown in Figure 2.2

2.9 Scope of the problem

We have planned to work on pigeon breeds based on their pattern gene. Pigeon has three main pattern genes which gives a different shape to the body of the pigeon. As we mentioned before there is no publicly available dataset. We could not find a dataset from [1] to test their CNN and our proposed SVM with LBP. We have tried to use our dataset with SVM and CNN in different scenarios. Problems are mentioned below that we have during the time of doing projects-

- Collecting data from 350+ verities of Pigeons are difficult.
- Most people have handful of few breeds. Hard to collect images.
- Pigeon can be categorized suing pattern, color and modifier gene. It's difficult to train the SVM based on pattern in large dataset.

2.10 Conclusion

We have analyzed the details about LBP, SVM, and CNN classification [2] [10] [11]. We are looking for a better and more robust solution to find out whether the existing systems in theory and methodology of those topics are efficient or not. It is the most fundamental research question when there could exist multiple or better solutions, and approach to identify the problems according to the research asked question.

Chapter 3
The Design Methods and Procedures

3.1 Introduction

In this chapter, we presented the proposed system method. Here we give an in-depth overview of system architecture in detail. This section is divided into three subsec- tions. Each of the section describes a different module of the proposed number plate detection and recognition system. Section 3.2 describes the proposed methodology Section 3.3 describes the proposed system architecture, which is the heart of the en- tire system.

3.1.1 Machine Learning

Artificial intelligence (AI) is the domain where computer has ability to control a set of tasks that are usually done by humans. Generally, this task requires human in- telligence and discernment. Machine Learning (ML) is the sub field of Artificial In- telligence(AI). ML is the way of providing machines the ability to learn a task and improve those learning performance on the task more efficiently and accurately. De- pended on data. The more different types of data. In our case we use image type. So, basically it is an approach to distribute data in machine learning. where it learns by aggregating models that have been trained. This type of algorithm then predicts the object from actuals. ML has classification and clustering approaches. So, there's no human's assistance. They can learn by their self with the help of those algorithms. Also, humans supervised these task [1] [9].

3.1.2 Supervised Learning

In Supervised learning, the input and output are given as label the current model im- proves it by using different kernel [10] [12] [11]. SVM falls under supervised learning category. labeled datasets to train algorithms, where it is classifying data or predict outcomes accurately. All the training data remains on the folder. The below Figure 3.2 and 3.1 gives an overview of machine learning approach.

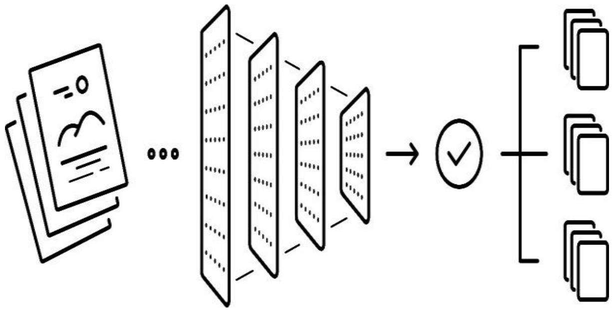

Figure 3.1: Supervised Learning Process

3.1.3 Reasons for Choosing Supervised Learning concept of SVM

SVM is a SL algorithm. Which is great for linear regression analysis

- Powerful tool.
- Proficient prediction model.
- Use of different algorithm.
- Distributed Learning using bagging.
- Resource Optimization.

Many applications of SVM in the real world that is Sentiment Analysis. Data that is not regularly distributed and has unknown distribution. Decision boundary separat- ing the two classes.

Limitation for Supervised Learning (SVM)
The limitation of SVM are: -

- Computation time is vast for supervised learning systems
- Limited or Unwanted data downs efficiency time
- Processed data takes long time
- Easily can be over fit

3.1.4 Future Steps of Supervised Learning

At present, the model gets trained with the label. Since the companies are heading toward Supervised Learning. the research study says 82%. They want to focus on improving the dataset.

3.2 Proposed System Architecture

In this section, we will discuss the design and operation details of the proposed Pi- geon breed image classification using LBP and SVM. Furthermore, in our research, we used a Support vector machine and local binary pattern to train and test the dataset. Implementation of the system required some methods. SVM linear, as well as RBF kernel, were used. Linear SVM parametric model when RBF cost more to separate data. We didn't see that many changes in result. Here is a Figure 3.4 of our proposed model.

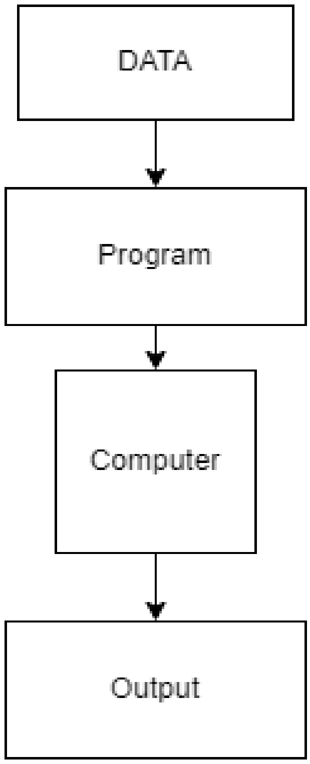

Figure 3.2: Flowchart of Proposed Architecture

3.3 Data collection

We have collected images from pet shops, local farmers, and breeders. We have taken the image of pigeons based on the pattern on their wing and body. Two types of pi- geon images are taken for Blue Bar and Checker pigeons. These are converted to a gray-scale image for enhancement. Besides, we have taken internet images from google and image were taken manually using the camera. There also exists slight variation between images that are taken at night and day image list for system train- ing is shown in figure 3.3 and the images of two pigeon types based on body pattern Checker and Bar pigeon.

3.3.1 Statistical Analysis

Dataset consist of Train, Test folder and inside the test and train folder there exist another Bar, Checker folder. This will be used for training and testing the dataset.

Figure 3.3: Sample view of collected images

3.3.2 Implementation Requirements

Deep Learning task such as image classification requires good processing power. Our LBP and SVM first approach implementation requires a computer with minimum specs. Because their respective data set was less compared to CNN and SVM ap- proach. So, in CNN and SVM part we need a good CPU and GPU to run those mod- ules. Our Ram 8GB. The language we used “Was Python” to run different modules. It helps us in scripting, Library is used to perform a specific task. This is popular for Deep learning. Main library which we use: -

- scikit-learn for SVM & SVC [12]
- scikit-image for LBP image feature extractions [11]
- Tensor Flow is a ML and DL framework [10]
- Matplotlib for visualization of data [13]
- Image Data Generator augment the images [14]

3.4 Proposed Methodology

In our research, we used a Support Vector Machine (SVM) and local binary pattern (LBP) to train and test the dataset. Which we created using various pictures from google, local farmer, and pet store owners. Implementation of the system required some methods and steps.

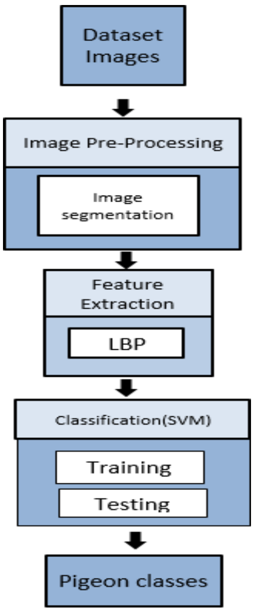

Figure 3.4: Flow Chart of Proposed Methodology

3.4.1 Implementation process

We have applied LBP for the body pattern descriptor and SVM for classifying the training and testing recognition algorithm. The implemented steps of the system are given below in detail: -

- We got the concept through people's interest in pigeons.
- First the picture of the Checker and Blue Bar pigeons were taken from Google and using our camera from the local pet store and farming sites to complete our dataset
- Then in pre-processing step, we work with image segmentation, the input im- age is first converted into a grayscale image
- Image are divided into several small blocks of pixels from which we extract local binary patterns [2] [11]
- Then features are extracted using a local binary pattern(LBP) [2]. We will be

getting each edge, flat and corner.

$$LBP = \sum_{p=0} p = 1(g_p - g_c)2^p$$

- LBP values are extracted from the Centre pixel as the threshold for each pixel, compared with the neighbor pixel, then the results are transformed into binary 0 & 1. We normalize for SVM. Because it is better to feed same scale. This will create 36 different combinations of fea- ture. We Assign each of these pattern in individual lebal. Which will be pass into SVM [4].
- In classification, we use Support Vector Machine (SVM) for classification test and training data set [12].
- Equation [14] of SVC :-

$$\min_{w,b,\zeta} \frac{1}{2} w^T w + C \sum_{i=1}^{n} \zeta_i$$

$$\text{subject to } y_i (w^T \varphi(x_i) + b) \geq 1 - \zeta_i, \quad \zeta_i \geq 0, i = 1, ..., n \tag{3.1}$$

x becomes

$$\sum_{i \in SV} y_i \alpha_i K(x_i, x) + b \tag{3.2}$$

- Equation [12] of LinearSVC :-

$$\min_{w,b} \frac{1}{2} w^T w + C \sum_{i=1}^{n} \max(0, 1 - y_i (w^T \varphi(x_i) + b)) \tag{3.3}$$

Hinge loss is the form that is directly optimized by LinearSVC

3.4.2 Algorithm

Below simple algorithm about feature extraction using LBP and classifying using SVM

Algorithm 1: simple algorithm

```
Input: train, test
Output: accuracy
1  STEP 1: Load data into folder
2  STEP 2: [2] function called, compute_lbp(arr ) radius = 3, n_points = 8 * radius
3  for i in range lbp : do
4            f eature[int(i)] += 1.
5            norms (feature, ord=1) {normalizaion}
6            return f eature

7  STEP 3: function called,load_data()
8  par th(), Vector = [], Category = [] label_train = Category_train
9  STEP 4:
10 LinearSVC () fiting into SVC (Vector_train, label_train)
```

3.5 Conclusion

This chapter is an important chapter, which describe the core part of our system in detail. System will be able to predict from actual.

Chapter 4
Performance Evaluation
4.1 Introduction

This chapter presents experimental results from the proposed model and the previ- ous Suggested method results.

4.2 Technical Requirements

The following technical requirements were chosen as a basis for the speed breaker detection system:

- System should be able to detect the pattern and distinguish them.
- Different filter used to increase accuracy
- Images are loaded and labeled

4.3 Experimental Setup

To complete the proposed methods, we needed to use computer and camera to cre- ate dataset. Python programming language was used and some build in libraries for extracting the features from the images. We used desktop, which has 8GB for DDR3 RAM, 8 core ryzen 3500 processor with GT730 2GB RAM graphics card, 240 GB SSD. We used camera and web based image to see the accuracy result in both day light and night. In addition, Pyhton 3.8.0 64bit IDLE on Windows 64bit operating system with jupyter notebook. Python libraries like skimage.feature, sklearn, sklearn.svm, tensorflow, dlib, numpy, matplotlib, keras e.t.c were used for project.

To implement the training and testing of our project we have used Google Cloud resources. A graphical representation of our experimental setup Figure 4.1 Extracted features using Local Binary Pattern (LBP).

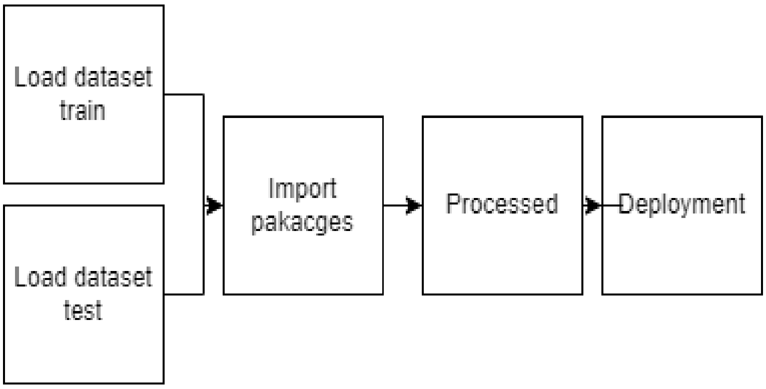

Figure 4.1: Data set loading and testing

Load dataset from their directory called train and test. Inside those directory we take two type of data called Bar pigeon and Checker pigeon.Then we will have im- ported Library packages.

Table 4.1: Imported Packages

Imported Packages	**Reason**
skimage.feature	implementation of LBP
sklearn	scikitlearn SVM
matplotlib	Visual representation of accuracy
pathlib	Path set up for dataset
numpy	Math related

Extracted features using Local Binary Pattern (LBP). Then we pass it in the label set. LinearSVM and RBF kernels were used.

4.4 Experimental Results and Analysis

The test was performed using dataset of 250 image, these are day and nigh picture taken using camera, with google image in mix. We were able to achieve 95.00 % ac- curacy. suggested method has given less accuracy compare to previous with 95.33 %
[1] because we were unable to get their dataset. Our dataset is different. [1]They clas- sified based on shape of pigeon. We know that (a)Fantail. (b) Jacobin. (c) Archangel.
(d) Rock dove, figure 4.2 .

Figure 4.2: Dataset of Fantail, Jacobin, Archangel, Rock dove

Our approach is different from the previous method because we focused on Dif- ferent patterns in the pigeon body. Since people has body pattern in different shape. We focused on two types of pigeon. They have unique characteristics. Bar pigeon characteristics are bar like shape in their wings and checker has check like pattern on their body. We used 2D gray image.

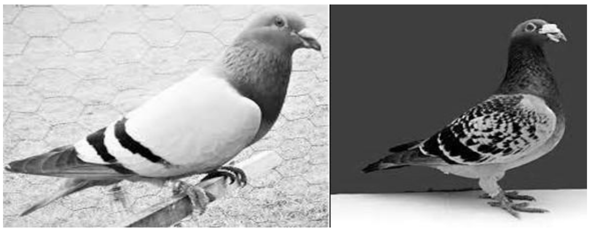

Figure 4.3: Dataset of Blue Bar and Checker

4.5 Comparison Between Our Own Implementation of CNN and Propose LBP with SVM Model

We have made a comparison between previous CNN modes with our model using LBP and SVM that is shown in table 4.2. We have seen that our dataset gave more accuracy result using SVM and LBP is high then rest of the methods.

Table 4.2: Accuracy of Different Implementation of our dataset Results

Model	Technique	Layer	Accuracy
CNN	—	4 pooling Dense 512,	88.89%
CNN with SVM	Final layer SVM	Dense 512 pooling 3	88.86%
SVM with LBP	LinearSVC, 150 images	—	95.00%
SVM with LBP	LinearSVC, 250 images	—	97.37%
SVM with LBP	RBF extraction, 250 images	—	97.37%

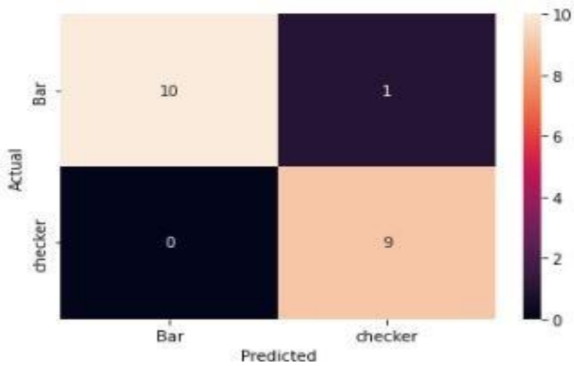

Figure 4.4: Heat-map of Predicted and actuals with 150 images

The accuracy comparison is shown in figure 4.5 for CNN 4 dense layer, CNN with SVM, Linear SVC and RBF. 10,9 are correctly classified [15]. where 1 is bar but pre- dicted Checker.

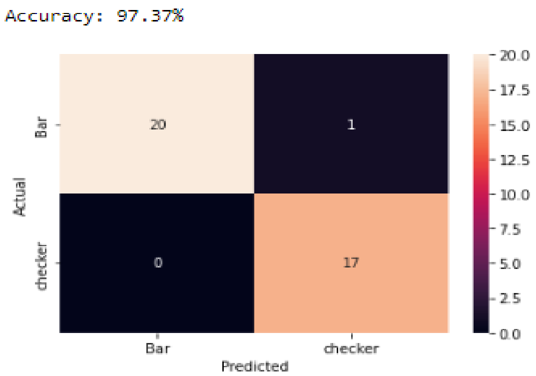

Figure 4.5: Heat-map of Predicted and actuals with 250 images

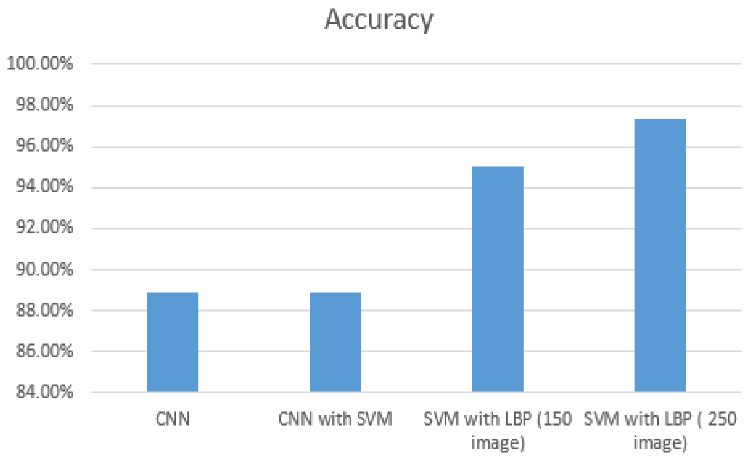

Figure 4.6: Result accuracy

4.6 Discussion

There are several challenges implementation of this task. Though we could not get the previous data set we saw an increase in accuracy. When using images, which we took using the camera the accuracy comes randomly rather sequential.

Chapter 5 Conclusion

In this research, accurate classification and detection of pigeon breeds using DL and ML. In this chapter, our work is concluded by mentioning the contributions of the research. The limitations of the system are also mentioned with the future mission and vision of this research.

5.1 Discussion

Pigeon breed detection using CNN computer Vision, machine Learning and Deep Learning has already been used to detect breed such as (Rock dove, Fantail, Jacobin) [1]. We didn’t make or upgrade any algorithm just used two classifier LBP & SVM. We studied some projects paper but didn’t get any other work but CNN. So, we are using SVM with LBP to create features. We compared with our implementation of CNN with the dataset which we created. The proposed technique, tools, and methodol- ogy are very helpful for modern farmers or buyer to detect the pigeons. Every time people takes picture and post it on cloud our database size will increase, more room for growth.Our proposed system doesn’t need any extra Internet of things devices for cap- turing images.Since we saw it can detect google, night and day image. By using the concept SVM and LBP. It gives better result. In addition to that, this method of recognizing Bar pigeon is not only faster but also more accurate than the other meth- ods. In comparison with the traditional methods, the prediction method achieves

THE American Journal of Humanities and Social Sciences Research (THE AJHSSR) 2024
E-ISSN: 2581-8868
Volume-07, Issue-02, pp-12-28
www.theajhssr.com Crossref DOI: https://doi.org/10.56805/ajhssr
Research Paper Open Access

same accuracy.

5.2 Limitation of the research

The proposed approached has been evaluated with the certain constraints as given below: -

- Our proposed method takes great amount of time to process big dataset com- pare to its previous method CNN.
- One of the main limitation is lack of data in Pigeon image.
- SVM is not suitable for large dataset
- Image has to be noise redacted.
- We have yet to implement different SVM filters better then LBP.

5.3 Future Works

This research is intended to be open for future contributors in testing different al- gorithms. We would like to work with this same topic Pigeons. Some of the future scopes that are relevant to this work are. Addressing challenges to increase detection accuracy using more filter in both methods to see which one performs better for this particular dataset. Implementing CNN with SVM with proper filtering or we could reduce the noise quality of the images to get more accurate readings using SVM. We are interested in enhancing the current work with existing system or better.

5.4 Concluding Remark

In this research, authors have introduced a different way of implementing the dataset. Where authors are focused on reducing the computation cost. This was excellent re- search to work. Opportunity to learn more things about AI. A lot of existing ideas and new ideas, new functionality. We are looking forward in future, where must keep the betterment of our methodology

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