

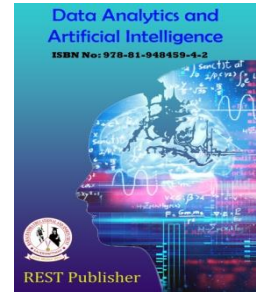


## Data Analytics and Artificial Intelligence

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# Tamil Nadu Bus Transportation Riding Ticket Checking and Updating Based On Gender Classification Using Relu (Neural Network)

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**Abstract:** Buying a ticket in advance usually guarantees that there will be a seat on the bus for the desired journey on a specific date and time, where the passenger must take the tickets. A ticket is a voucher that indicates that an individual is entitled to enter and have the right to travel on a bus ticket vehicle, but usually some people will not take a ticket for them because they do not understand the importance of avoiding this type of behavior. For this, we came up with a solution where a camera is placed inside the bus that follows the face of men and women, detects the face and checks which passengers have taken a ticket and who has not. These processes take place using the ReLU algorithm, which is used for the detection of human faces. Thus, ReLU was born, which solved this problem by using a hidden layer. The main and most important feature of ReLU is a hidden state that remembers some sequence information. There are other types of neural networks in deep learning, but for object identification and recognition, ReLU networks are the preferred architecture. The main objective of this project is to find people who don't have tickets in the bus, especially in government buses, so we are developing a gender classification that counts male and female passengers. The main objective of gender classification in bus tickets in Tamilnadu will not be properly considered by the conductor, so we are developing an automated counting project to count the occupations of women in buses on every trip and it will be automatically updated in an Excel spreadsheet and a chart will display all possible information. transport at higher transport costs. We focus on government bus because many people don't take ticket in government bus. So that such things do not happen in buses, where camera surveillance is developed using the ReLU algorithm.

**Keywords:** ReLU Algorithm, Face Detection, Bus Ticket Counting for Tamilnadu Buses, Gender Classification and Camera.Domain: Machine Learning.

## 1. INTRODUCTION

For people living in communities, gender is an important factor in the interaction between individuals. With the development of technology, the use of smart devices has increased and social media has started to attract everyone's attention. However, everyday gender recognition studies have gained importance and the number of applications using these techniques has increased. Face images are widely used in such applications because they provide useful information that can be used to extract human interaction. A gender classification approach using face imaging generally consists of image processing, feature extraction, and classification stages. These phases may vary depending on the purpose of the study and the characteristics of the methods to be used. Therefore, the classifier, method and extracted features have a significant effect on the performance of the study. Deep learning techniques are now widely used for various tasks such as classification, automatic feature extraction, object recognition, etc., due to their high classification accuracy. Motivated by other fields, researchers have also used deep learning methods for gender prediction and classification from facial images. In this study, a gender classification method using deep learning techniques is proposed. Specifically, ReLU and the model will be used for gender classification from images. In addition, a comparative analysis between our method and state-of-the-art methods will be performed.

## 2. OBJECTIVE

- In this project, we evaluated the application of gender prediction using machine learning using ReLu.
- In this project we can easily find age, gender and people who try not to buy tickets and travel easily by bus and train. By doing this we can help the government to make a profit.
- For this task, this study of different design was developed, gender classification is one of the key segments of research in biometric as social applications, with the aim of making adequate future forecasting and disclosure of information about a specific individual possible.

## 3. LITERATURE REVIEW

They performed gender recognition from face images using a local receiver in the area of excessive learning Machine (LRA-ELM) and CNN architecture. Experiments were performed using approximately 11 thousand images from the Adience dataset for age and gender recognition. The proposed method resulted in 80% and 87.13% accuracy with LRA-ELM and CNN, respectively. [1] Janahiraman and Subramaniam tried to create gender classification using different CNN architecture models. The dataset was created from facial images of Malays and some Caucasians. Their results achieved an accuracy of 88% for the VGG-16 model, 85% for the ResNet-50 model, and 49% for the Mobile Net model. [2] Arora and proposed a CNN model for gender classification with face images. In the experimental studies, 1500 images were used for training and 1000 images were selected from the CASIA database and validated. As a result of the experiments, an accuracy of 98.5% was achieved. [3] In this, a basic convolutional network architecture was proposed to enhance the performance of automatic age and gender classification. This technique also provides optimal results even in the presence of limited training data. High classification accuracy was Sahra Tilki | Genus. Classification. Using DL. Techniques. [4] Ranjan et al proposed a method called Hyper Face for simultaneous face recognition, pose prediction and gender recognition using CNN. This method combines the intermediate layers of a deep CNN with a separate CNN, and then a multitasking learning algorithm was applied to the fused features. Hyper Face-ResNet is based on the ResNet-101 model to increase the speed of the algorithm, and Fast Hyper Face variants have been proposed to generate zone recommendations.

## 4. EXISTING SYSTEM

In this project study, a gender classification method using face images with CNN models is proposed. The accuracy obtained using the CNN model and the ReLu architecture was compared with the results of similar studies conducted in the literature. The accuracy rates obtained as a result of experimental studies and the performance of the data set in the models were compared. Using these procedures, the achieved accuracy rates were compared to those of similar studies in the literature, and better results were observed. In future studies, it is planned to make a comparison between different CNN models with a multi-image dataset.

## 5. DISADVANTAGES

- The obtained results were only used for images but not in the real web cam.
- The accuracy obtained is very low.
- Both training and executing models are time-consuming.

## 6. PROPOSED SYSTEM

The proposed work is based on gender classification using the ReLu algorithm. Classification of gendered face images and poses the task as a multi-class classification problem as such to train a model with a loss function based on the classification as the training objective. We perform data preprocessing on the training dataset image using flatten on the one-dimensional gender vector feature of the input image. Using the karas libraries, we provide 1000 images of men, women and children to train the dataset for gender classification. The proposed network provides a significant improvement in accuracy over the ReLu sex classification algorithm, but requires considerable time to train our network to implement the correct prediction. Where the proposed approach works very well in the adult age group, although it failed to distinguish very young subjects. the moving average order.

## 7. ADVANTAGES

- The results obtained by this method are more accurate compared to other methods.
- Training models is easier.
- The entire process takes less time compared to other algorithms.

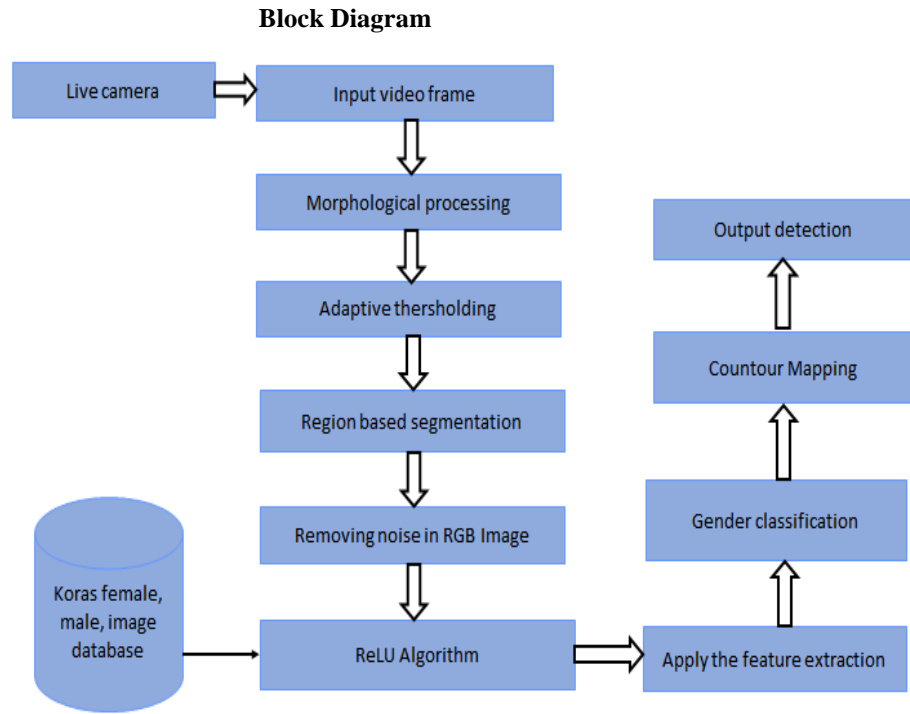


FIGURE 1. Block Diagram

## 8. MODULE DESCRIPTION

**Input video processing:** The input of the human faces from the bus video can be captured from the camera, then the video can be converted into frames 25fps. The multiple frames can be converted into single frame format.

**Segmentation module:** In the segmentation process, unobtrusive edge detection takes place, where this technique extracts useful structural information from various vision objects and dramatically reduces the amount of data to be processed, with this refined detection, all image edges are extracted for accurate age identification and gender.

**Data collection module:** Training data is the initial data used to train machine learning models. Training datasets are fed to machine learning algorithms that teach them how to predict or perform a desired task.

**Keras and the tensor flow module:** This tensor stream is a high-level deep learning API developed by Google for implementing neural networks. It is written in Python and is used to facilitate the implementation of neural networks. It also supports the calculation of multiple backend neural networks.

**Contour mapping:** The human face computed by using Relu algorithm after that detection of the human face, its contour mapping process will be mapping that human face to identify the men and women.

## 9. SYSTEM FUNCTION

**Morphological Processing:** Morphology is an image processing technique based on the shape and form of objects. Morphological methods apply a structuring element to the input image and produce an output image of the same size. The value of each pixel in the input image is based on the comparison of the corresponding pixel in the input image with its neighbors. By choosing the neighbor size and shape, you can build a morphological operation that is sensitive to specific shapes in the input image. Morphological operations are first defined on grayscale images where the source image is planar. The definition can then be extended to full color images. Combinations of these operations are often used to perform morphological image analysis. There are many useful operators defined on mathematical morphology. They are dilation,

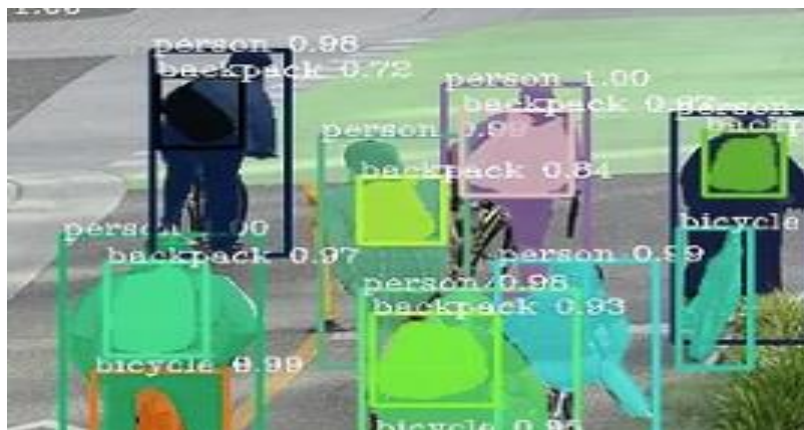
erosion, opening and closing. Morphological operations apply structuring elements to an input image and produce an output image of the same size. Regardless of the size of the structuring element, the origin is located in its center.



**FIGURE 2.** Morphological Processing

**Segmentation Process:** Segmentation divides the image into different regions containing each pixel with similar attributes. To be meaningful and useful for image analysis and interpretation, regions should be strongly related to the depicted objects or features of interest. Meaningful segmentation is the first step from low-level image processing transforming a grayscale or color image into one or more other images to describing a high-level image in terms of features, objects, and scenes. The success of image analysis depends on the reliability of segmentation, but accurate image segmentation is generally a very challenging problem.

Segmentation techniques are either contextual or non-contextual. The latter do not take into account the spatial relationships between elements in the image and group pixels together based on some global attribute, e.g., gray level or color. In addition, contextual techniques exploit these relationships, e.g. group pixels with similar gray levels and close spatial locations.



**FIGURE .3** Segmentation Processing

**Database Management:** Databases are used almost everywhere including banks, retail, websites and warehouses. Banks use databases to track customer accounts, balances and deposits. Retail stores can use databases to store prices, customer information, sales information, and quantities on hand. Database management systems (DBMS) are software systems used to store, retrieve, and query data. A DBMS serves as the interface between the end user and the database and allows users to create, read, update, and delete data in the database.



FIGURE 4. Database management

**Region Based Segmentation:** Region-based segmentation methods involve an algorithm that creates segments by dividing an image into different components with similar properties. These components, simply put, are nothing more than a set of pixels. Region-based image segmentation techniques first look for some starting points—either smaller parts or significantly larger chunks—in the input image. Further, certain approaches are used either to add more pixels to the seed points or to further reduce or reduce the seed point into smaller segments and merge with other smaller seed points. So, there are two basic techniques based on this method. The RGB color model is an additive color model in which the red, green, and blue primary colors of light are added in different ways to reproduce a wide range of colors. The model comes from the initials of three complementary basic colors, red, green and blue. The main purpose of the RGB color model is to capture, represent and display images in electronic systems such as televisions and computers, although it is also used in conventional photography. Before the electronic age, the RGB color model had behind it a solid theory based on human color perception. RGB is a device-dependent color model: different devices detect or reproduce a given RGB value differently because the color elements (such as phosphors or dyes) and their response to individual levels of red, green, and blue differ between manufacturers, or even within the same device over time. So, an RGB value does not define the same color between devices without some kind of color management.

**Keras:** Keras acts as an interface to the Tensor Flow library. Until version 2.3, Keras supported several backends, including Tensor Flow, Microsoft Cognitive Toolkit, and Theano and PlaidML. As of version 2.4, only Tensor Flow is supported... Designed to enable rapid experimentation with deep neural networks, it aims to be user-friendly, modular, and extensible. It was developed as part of the ONEIROS (Open-ended Neuro-Electronic Intelligent Robot Operating System) research effort and is lead author and maintainer by François Chollet, an engineer at Google.

**Relu Algorithm:** ANN is the part of the Deep learning where we will learn about the artificial neurons. To understand this, we have to understand about the working of the neurons in the proper way. In biology we understand that the neurons are used to accept the information of a signals sensed by the organs and these organs sends the sensed data to our brain so our brain can take the appropriate decisions based on the sensed organs. According to the sensed results our brain does some operations, calculations and give some appropriate answer/output. This output is followed by our sensed organs. If we want to implement all these brain functionalities artificially then this type of network is known as the Artificial Neural Network where we will take the single node (which is a replica of the Neuron) and partition it into further two parts. First part is known as Summation and second one is considered as a function is known as the Activation Function.

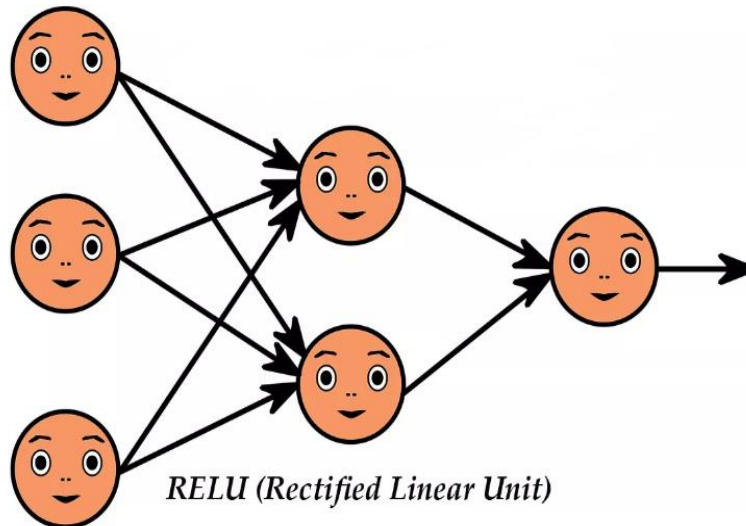


FIGURE 5. Relu algorithm

**Count our Mapping:** A contour map is a type of map where the shape of the earth's surface is represented by contour lines, the relative spacing between these lines indicating the relative slope of a particular surface. The meaning of a contour map is quite clear to us if we further deduce this definition means - that is the delineation of any real estate in the map, which is formed by the construction of lines. Lines are cut based on equal values of this property available as data points. In terms of contour map, it can be said that contour mapping is a kind of topographic mapping, but for a distinct study of this concept, A topographic map is a precise map that shows natural terrain as well as man-made objects such as buildings, roads or bridges. While contour maps represent elevation changes using contour lines.



FIGURE 6. Countour Mapping

## 10. RESULTS

Thus, we have implemented the gender classification using Relu rectified liner unit algorithm. The proposed framework's accuracy is improved by increasing the number of layers and training the images using back propagation.

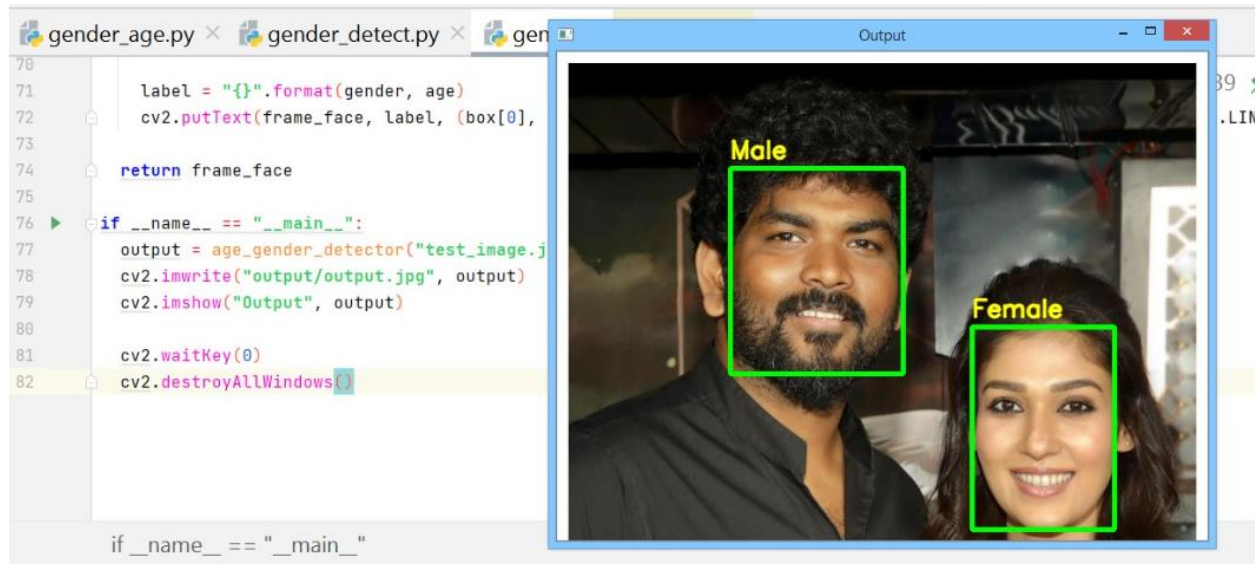


FIGURE 7. Gender Classification

## 11. CONCLUSION

Gender classification work has been done on using various methods. The classification is also done by using images but the features are calculated manually and they are trained. The features mainly considered are eyes, mouth, ears. The detailed overview for gender classification methods can be found in. The early neural network architecture was used to train near frontal image

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