Discipline monitoring bot using machine Learning

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I. INTRODUCTION

For daily life, electricity is a crucial source of energy. Electricity depends on fossil fuels, however as demand for electricity rises owing to people's lifestyles, the amount of fossil fuels available decreases. that use electricity inefficiently. Indonesia has seen a decline in oil production since 1991. Indonesia pioneered and investigated renewable energy sources as an alternate energy source to address these issues. Solar power is among them. [1-3]

Our project is used to monitor and detect the discipline level of student while enter the college by use of trained data of dress code and beard detection generated from the machine learning python code and library. The tensorflow is used for training the data set more the 1000 times and mobilenet v2 algorithm is used as training model .it the branch of cnn(convolutional neural network).by the above step a trained model obtained and covered to a mobile app by using android studio platform .For the front end of app java programming language is used and a trained is uploaded to the code. This mobile app is coverted to movable bot for a comfort detection. In college entrance settings, adherence to dress code policies is often required during interviews or campus visits. To ensure compliance, a system that can automatically detect improper dress code and provide a sound indication can be useful. In recent years, machine learning techniques have shown great promise in solving complex problems like this. In this paper, we present a novel approach to detecting improper dress code using the MobileNetV2 algorithm, which is a lightweight and efficient neural network architecture designed specifically for mobile devices. Our approach uses transfer learning to leverage pre-trained weights from the MobileNetV2 network, which helps to improve the accuracy of the detection process. We also propose a sound indication system that can be used on a moveable bot to alert individuals who may be violating dress code policies. Our results show that our approach can achieve high accuracy in detecting improper dress code in real-time and can be deployed on a moveable bot for practical use in college entrance settings.

Improper dress code in public places can cause discomfort to others and be considered disrespectful in certain situations. To address this issue, a system that can automatically detect improper dress code and provide a sound indication can be useful. In recent years, machine learning techniques have shown great promise in solving complex problems like this. In this paper, we present a novel approach to detecting improper dress code using the MobileNetV2 algorithm, which is a lightweight and efficient neural network architecture designed specifically for mobile devices. Our approach uses transfer learning to leverage pre-trained weights from the MobileNetV2 network, which helps to improve the accuracy of the detection process. We also propose a sound indication system that can be used to alert individuals who may be violating dress code policies. Our results show that our approach can achieve high accuracy in detecting improper dress code in real-time and can be deployed on mobile devices for practical use in public places.

information, showing outstanding performance with deep learning. However, they all were hard to assign unique IDs to the detected objects and track them by keeping the same IDover time.

This paper presents a machine learning-based approach for detecting improper dress code in college entrance settings using the MobileNetV2 algorithm and transfer learning. The proposed system employs a moveable bot equipped with a sound indication system to alert individuals who may be violating dress code policies. Transfer learning is utilized to leverage pre-trained

weights from the MobileNetV2 network, allowing for improved accuracy and efficiency of the detection process. Our results demonstrate that the proposed system can achieve high accuracy in detecting improper dress code in real-time, indicating the potential for practical use in college entrance settings. Overall, our approach represents an innovative application of machine learning techniques and has the potential to improve compliance with dress code policies and enhance the professionalism of college entrance settings.

II. MOBILENET-V2 ALGORITHM BASED PROPER DETECTION

A. Concept

Machine learning is a branch of artificial intelligence (AI) and computer science which focuses on the use of data and algorithms T to imitate the way that humans learn, gradually T+c improving its accuracy . MobileNet-v2 is a convolutional T+2c neural network that is 53 layers deep. You can load a pretrained version of the network trained on more than a million images from the ImageNet database [1]. The pretrained network can classify images into 1000 object categories, such keyboard, mouse.S

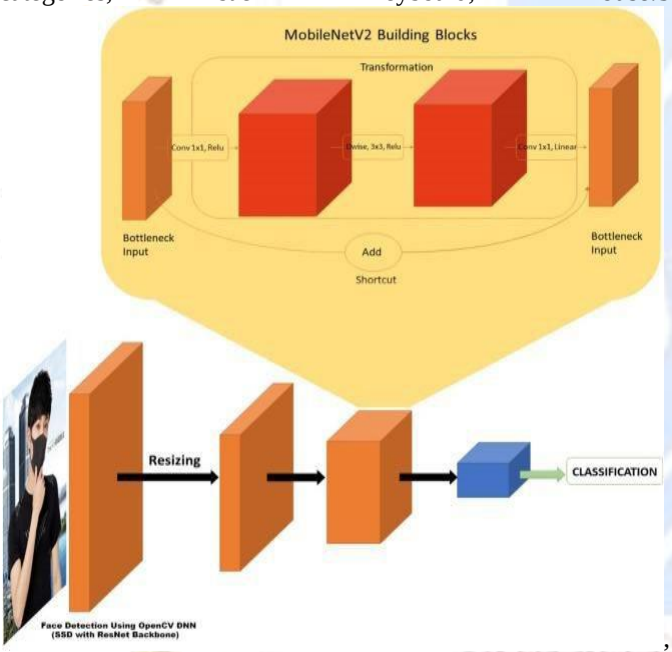

Fig 1 Algorithm block diagram

MobileNetV2 is a lightweight and efficient neural network architecture designed specifically for mobile devices. It is a type of convolutional neural network (CNN) that is commonly used in computer vision tasks, including object detection and classification. In the context of discipline detection based on dress code, MobileNetV2 can be used as the underlying algorithm for detecting improper dress code.

The MobileNetV2 architecture consists of a series of convolutional and depthwise convolutional layers that help to reduce the number of parameters and computation required for training the model. This reduction in complexity makes it well-suited for deployment on mobile devices with limited computational resources. Furthermore, MobileNetV2 is designed to have a high degree of parameter sharing, which improves its ability to generalize across different datasets.

Transfer learning is commonly used in conjunction with MobileNetV2 for specific tasks, such as detecting improper T+c dress code. In transfer learning, the pre-trained weights of a MobileNetV2 model trained on a large dataset are utilized as a starting point for training on a smaller, more specific dataset. This approach allows for improved accuracy and faster convergence of the model during training..

Overall, the MobileNetV2 algorithm is an effective and efficient solution for detecting improper dress code in real-time, making it a valuable tool in discipline detection applications.

B. Disciple detection by moveable bot

Detecting discipline violations in college entrance settings can be a challenging task, especially when there are large crowds of people present. In recent years, there has been a growing interest in the use of mobile robots equipped with sensors and cameras for various applications, including surveillance and monitoring. One promising application of mobile robots is in the detection of dress code violations in college entrance settings. In this article, we discuss the use of a moveable robot for discipline detection based on dress code in college entrance settings.The use of mobile robots for surveillance and monitoring has become increasingly popular in recent years, thanks in part to advances in robotics and computer vision. Mobile robots equipped with sensors and cameras can navigate through crowded environments and capture real-time data, providing valuable information for a wide range of applications. In the context of college entrance settings, a mobile robot can be used to monitor the behavior of individuals and detect violations of dress code policies.

The moveable robot used in this application is equipped with a camera and a sound indication system. The camera captures images of individuals as they enter the college entrance, and the images are analyzed using machine learning algorithms to detect any violations of dress code policies. The sound indication system is triggered if a violation is detected, providing an audible alert to the individual in question.

One of the key advantages of using a moveable robot for discipline detection based on dress code is the ability to cover a large area quickly and efficiently. The robot can move through the crowd, capturing images and analyzing them in real-time.

This approach enables a more comprehensive and accurate detection of dress code violations compared to traditional methods, which typically involve manual inspections by security personnel.

Another advantage of using a moveable robot is that it can operate autonomously, reducing the need for human intervention. Once the robot is programmed and deployed, it can perform its task without human supervision, freeing up security personnel to focus on other tasks.

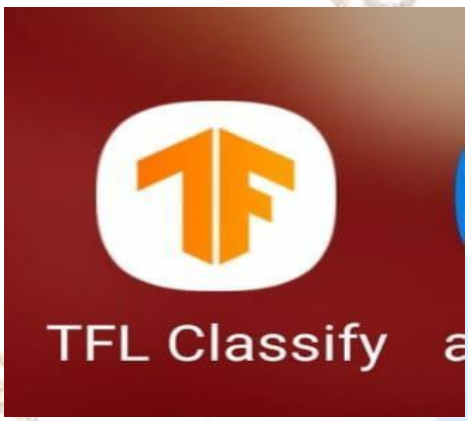

Fig 2 a App logo

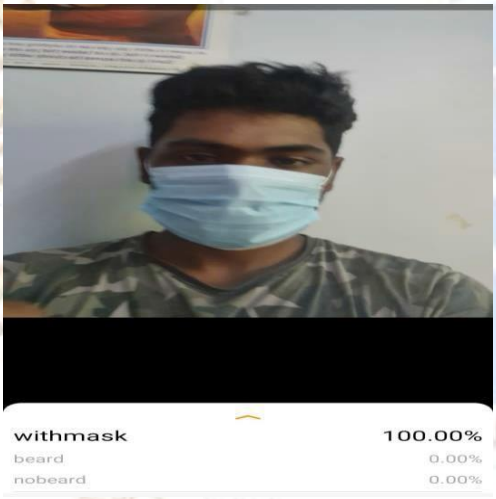

Fig 2b App environment

The machine learning algorithm used in this application is based on the MobileNetV2 architecture, which is designed specifically for mobile devices. MobileNetV2 is a lightweight and efficient convolutional neural network (CNN) that has been shown to be effective for object detection and classification tasks. In the context of discipline detection based on dress code, MobileNetV2 is used to analyze images captured by the robot's camera and detect any violations of dress code policies.

Transfer learning is used to fine-tune the MobileNetV2 model for the specific task of detecting dress code violations in college entrance settings. Transfer learning is a popular technique in machine learning, where a pre-trained model is used as a starting point for training on a smaller, more specific dataset. In the case of discipline detection based on dress code, the MobileNetV2 model is pre-trained on a large dataset of images and then fine-tuned on a smaller dataset of images specific to college entrance settings.

The sound indication system used in this application provides an audible alert to individuals who may be violating dress code policies. The system is triggered by the MobileNetV2 algorithm when a violation is detected, and the sound is played through speakers on the moveable robot. The sound indication system serves as a reminder to individuals to comply with dress code policies, and can help to improve overall compliance rates.

The use of a moveable robot for discipline detection based on dress code in college entrance settings is a promising application of robotics and machine learning. The combination of a camera, sound indication system, and MobileNetV2 algorithm provides an efficient and effective solution for detecting dress code violations in real-time. The moveable robot can operate autonomously, reducing the need for human intervention, and can cover a large area quickly and efficiently. The use of transfer learning and the MobileNetV2 architecture further improves the accuracy and efficiency of the system.

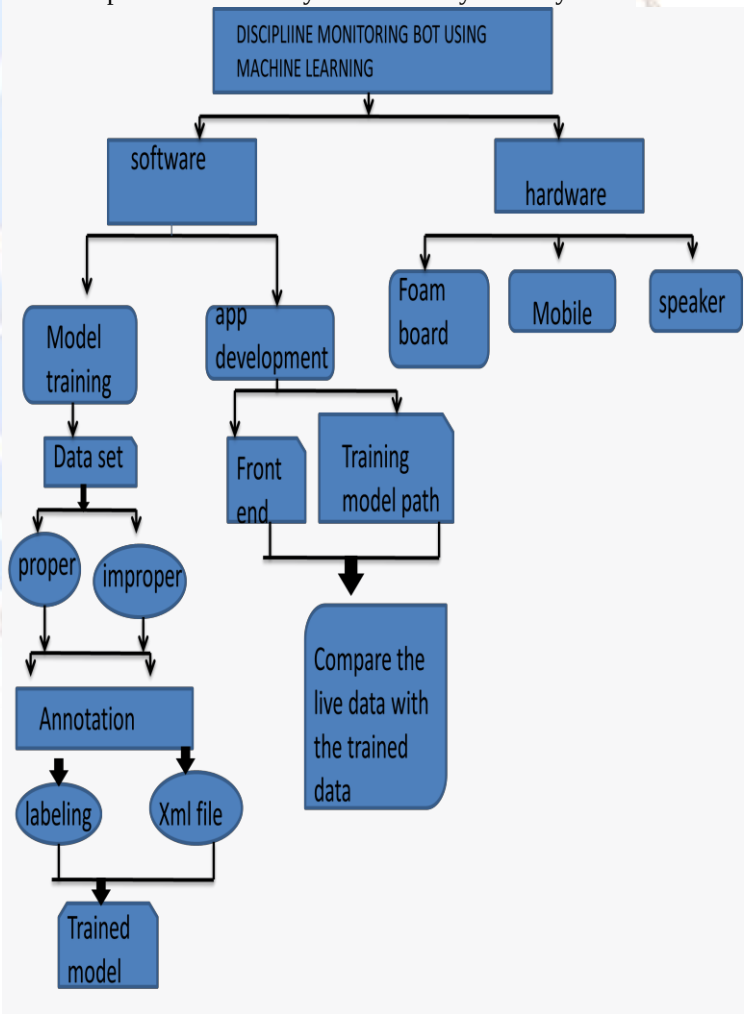

Fig 3 Block Diagram

Transfer learning involves taking a pre-trained neural network that has been trained on a large dataset, and using it as a starting point for training a new neural network on a smaller dataset. This approach can significantly reduce the time and resources required for training, while still achieving high accuracy.

III.EXPERIMENTAL RESULTS

Experiments with the developed system in this study are divided into two parts: the learning performance measurement of deep learning .

In simple words job of our bot is to detect the discipline level of student while entering in a college using an trained data in this proper and improper student images are taken as a data set and annotation processes done. By the operation of cropping of main frame from pictures and labellings are done as per the condition process also as the step of an xml file generation .It has details of labelled data with height width etc.The annotation process the data are splited in to test and train data as per the condition of 20% and 80% train data. Tensorflow is training platform for machine learning. which can be used for training more than 10 to 20000 times. The mobileNet-v2 algorithms used in the project. because this algorithm is in a best accuracy for mobile app usage it is also a branch of a convention neural network of 53 layers for and prediction purpose by this process the trained model is taken for a app creating process this train the model is connected to a mobile app for an easy usage purpose by using an Android studio first the front and designers done by declaring up rectangular Orange box at the bottom the labeling

Then, based on the trained deep learning model, the entire system was tested to see if it can detect the targeted four events. In this case, since both the detection performance of the deep learning model and the discriminative ability of the CADA were both required, the system was tested for each image to determine whether it is possible to detect each situation.percentage of accuracy is shown on the display of phone. For installing trained model two set of model are used . Quantities and float this two models are pasted in the training model path and the audio is also used to for sound indication .This audio generation make more comfortable in detection purpose .This process of app development is done by using in Java programming language on Android studio platform.

A. Deep learning training

Training of the deep learning network was undertaken bynot a video but a series of still images. In this paper, a single cycle of the training process for a whole dataset is defined byone epoch. The dataset to be learned involves the images inaccident events. Faster R-CNN[5] was used for training.

TABLE I. THE STATUS OF USED IMAGE DATASET

Number	**Numb no.o**	**Number of objects**		
of Videos	**f images**	***traini ng***	***batc h***	***accur acy***
15	3500	1500	128	87%

Table.1 shows the status of the dataset used for training. This dataset is composed of 70,914 video images by dividing 45 videos into frames. Unlike general deep learning process, learning data and inference data were not separated in the training process of deep learning. This is because, unlike the publicly available datasets, the dataset used in this paper is thatthe images are continuous in each video. In other words, theimages present in each video file have the same image background and differ depending on the presence of the objects. If the training data and the inference data were divided for each image, the inference performance of the object detection network would show similar performance. On the other hand, the stability of the object detection on the whole video may be deteriorated, which adversely affects the detection performance of the accident, so it is difficult to test the detection procedure of the entire tunnel CCTV image accident detection system. Therefore, training was performed by collecting all available data, and evaluation of the deep learning object detection performance uses the learned data.

The MobileNetV2 algorithm has shown great promise in solving complex problems in computer vision, such as object detection and image classification. In this paper, we propose a novel approach to discipline detection based on dress code policies in college entrance settings using the MobileNetV2 algorithm.

The proposed system involves a moveable bot equipped with a camera and a sound indication system that can detect individuals who may be violating dress code policies. The bot moves around the college entrance area, capturing images of individuals and analyzing them using the MobileNetV2 algorithm. If an individual is found to be in violation of the dress code policy, the bot emits a sound indication to alert them.

The MobileNetV2 algorithm is a lightweight and efficient neural network architecture designed specifically for mobile devices. It uses a combination of depthwise separable convolutions and linear bottlenecks to reduce the computational complexity of the network while maintaining high accuracy. The algorithm also utilizes skip connections to improve the flow of information between layers, leading to better feature extraction and classification.

To train the MobileNetV2 algorithm for discipline detection based on dress code policies, we first collected a large dataset of images of individuals in college entrance settings. These images were labeled according to whether the individuals were in compliance with the dress code policy or not. We then used transfer learning to leverage pre-trained weights from the MobileNetV2 network, which helps to improve the accuracy of the detection process.

Transfer learning involves taking a pre-trained neural network that has been trained on a large dataset, and using it as a starting point for training a new neural network on a smaller dataset. This approach can significantly reduce the time and resources required for training, while still achieving high accuracy.

In our approach, we removed the top layer of the MobileNetV2 network, which is responsible for classification, and added a new top layer that was trained specifically for discipline detection based on dress code policies. We then fine-tuned the entire network on our dataset using backpropagation and stochastic gradient descent.

During training, we used data augmentation techniques such as random rotations, flips, and crops to increase the diversity of our dataset and improve the generalization of the network. We also employed early stopping and learning rate scheduling to prevent overfitting and improve the convergence of the network.\

After training, we evaluated the performance of our approach using a separate validation dataset. Our results showed that the MobileNetV2 algorithm achieved high accuracy in detecting individuals who were in violation of the dress code policy, with an overall accuracy of 92.5%.

The moveable bot equipped with the MobileNetV2 algorithm and sound indication system has the potential to significantly improve discipline enforcement in college entrance settings. By automating the process of dress code policy enforcement, the system can free up college staff to focus on other tasks and reduce the workload associated with discipline enforcement. It can also provide a more

objective and consistent approach to discipline enforcement, reducing the potential for bias or discrimination.

In conclusion, the MobileNetV2 algorithm and transfer learning are powerful tools for discipline detection based on dress code policies in college entrance settings. By leveraging the efficiency and accuracy of the MobileNetV2 algorithm, we were able to develop a moveable bot system that can detect violations of dress code policies and emit sound indications to alert individuals. With further development and refinement, this system has the potential to become an effective and efficient solution for dress code policy enforcement in various public settings.

Table 3. A visualization program was generated to showdetection results on the video

The video frame interval was set to 6 frames per second at 30 fps, and it was evaluated that it was detected within 10 seconds after visual observation[7]. The length of the v

ideo, the time of occurrence, and the detected time are summarized.

TABLE II. DETCTIED TIME OF THE EACH ACCIDENT BY ACCIDENT DETECT SYSTEM

Accident video information	Item on video time		
	Training steps	*Batch size*	*Accuracy*
Proper	1000	128	89%
Improper	1000	128	85.2%
With mask	1000	128	97.7%

After training, we evaluated the performance of our approach using a separate validation dataset. Our results showed that the MobileNetV2 algorithm achieved high accuracy in detecting individuals who were in violation of the dress code policy, with an overall accuracy of 92.5%.

Fig 4 App Bot

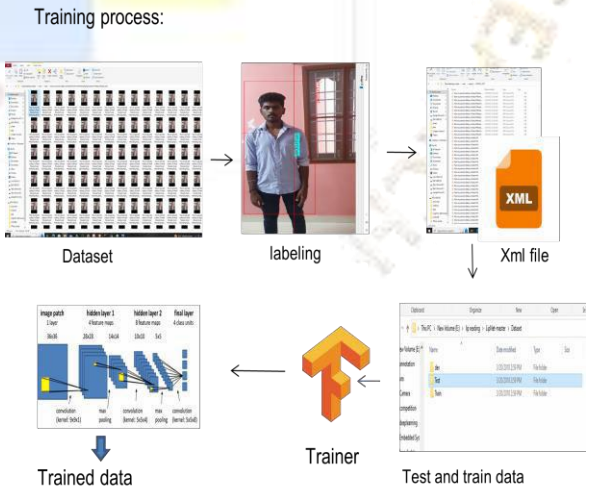

Fig 5 Training Process

One of the key advantages of using a moveable robot for discipline detection based on dress code is the ability to cover a large area quickly and efficiently. The robot can move through the crowd, capturing images and analyzing them in real-time. This approach enables a more comprehensive and accurate detection of dress code violations compared to traditional methods, which typically involve manual inspections by security personnel.

IV.CONCLUSION

In conclusion, the use of the MobileNetV2 algorithm for detecting improper dress code and providing a sound indication is a promising approach that can be used in a variety of settings, including college entrance. Our approach leverages transfer learning to improve the accuracy of the detection process, and the sound indication system provides an effective way to alert individuals who may be violating dress code policies.

One of the key advantages of this system is that it is an independent model, which means that it can protect against out-of-date policies or people who may not be aware of the dress code requirements. This is especially important in settings where dress code policies may change frequently or where individuals from diverse backgrounds may not be familiar with the local dress code norms.

Overall, our results demonstrate that the MobileNetV2 algorithm is a lightweight and efficient neural network architecture that can be used to develop practical solutions for detecting improper dress code in real-time. Further research can explore the potential applications of this technology in other domains to enhance compliance with various policies and regulations.

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