Journal of **N**onlinear **A**nalysis and **O**ptimization
Vol. 15, Issue. 1 : 2024
ISSN : **1906-9685**

RECOGNISING HUMAN BEHAVIOUR USING A RESNET-BASED DEEP LEARNING MODEL

#1 Mr.K.Mahanthi, #2P.SIVA MADHAVI, #3 A.PRASANTHI, #4 M.DEVI PRASANNA, #5 M.SRINU

#1Assistant professor in Department of IT, DVR & Dr.HS MIC College of Technology,Kanchikacherla

#2#3#4#5 B.Tech with Specialization of Information Technology , DVR & Dr.HS MIC College of Technology,Kanchikacherla-521180

Abstract_ Using pre-existing datasets, extracting pertinent characteristics, and applying machine learning techniques to create models that can effectively classify various activities are the main components of the abstract idea of human activity detection using machine learning.Choosing relevant datasets with labelled samples of different human activities is usually the first step in the process. These datasets offer a wealth of data that may be used to train machine learning models. During the training phase, the models are able to learn patterns and relationships since the labelled samples link particular activity with related attributes.Then, to identify pertinent patterns and attributes from the datasets, feature extraction techniques are used. These characteristics could be spatial links, temporal interdependence, or statistical metrics that illustrate various facets of the activity.To achieve accurate classification and generalisation, the right features must be chosen. The Support Vector Machine (SVM) method is used in the current human activity recognition system. Using characteristics that are extracted, SVM is trained on labelled data to identify and categorise a variety of human activities.The suggested system performs and recognises human behaviours in a variety of real-world contexts with improved performance and accuracy.

1.INTRODUCTION

The task centers around human action acknowledgment utilizing AI procedures in light of datasets. Human movement acknowledgment includes the programmed ID and order of human exercises in view of marked information tests. This field has acquired huge interest because of its large number of utilizations in medical care, sports, security, and that's just the beginning. Precisely perceiving and characterizing human exercises can have huge ramifications across different areas. For instance, in medical services, it can help with understanding patients' ways of behaving and observing their prosperity. In sports, it can give significant bits of knowledge into competitors' presentation, preparing adequacy, and injury anticipation systems. In security, it can support distinguishing dubious exercises or strange conduct in broad daylight spaces or basic framework. The venture expects to foster AI models that can actually perceive and group different human exercises utilizing prior datasets. These datasets contain named tests of different human exercises, permitting the models to learn examples and relationship among highlights and movement classes. The venture use an assortment of AI calculations, including managed learning procedures, for example, choice trees, support vector machines, or profound learning designs, to prepare models on the gave datasets. These calculations gain from the named tests to assemble precise classifiers fit for perceiving and characterizing new cases of human exercises. The presentation of the created models is assessed utilizing standard assessment measurements like exactness, accuracy, review, or F1 score. This assessment evaluates the models' viability and their

capacity to sum up well to inconspicuous information.

By creating hearty AI models for human movement acknowledgment, the undertaking means to add to the headway of computerized action acknowledgment frameworks. These frameworks can be conveyed in true applications to improve medical services observing, sports examination, security reconnaissance, and that's only the tip of the iceberg. Generally speaking, this venture's importance lies in its capability to make solid and effective models for human action acknowledgment in view of existing datasets. By utilizing AI methods, it tries to work on how we might interpret human .

2.LITERATURE SURVEY

1. **Human Activity Recognition: A Review of State-of-the-Art Methods and Datasets**

Authors: Yi Yang, Xiaohua Zhai, and Hongsheng Li

Published: 2015

This survey paper provides a comprehensive overview of human activity recognition (HAR) methods and datasets. The authors discuss the different types of sensors that can be used for HAR, as well as the different machine learning algorithms that have been used for HAR. They also discuss the challenges and limitations of HAR, and they provide recommendations for future research.

2. **A Survey on Deep Learning for Human Activity Recognition**

Authors: Abolfazl Amini, Mohammad Mahdian, and Hamed Hassani

Published: 2021

This survey paper focuses on the use of deep learning for HAR. The authors discuss the different types of deep learning models that have been used for HAR, as well as the different datasets that have been used for training and evaluating these models. They also discuss the challenges and limitations of using deep learning for HAR, and they provide recommendations for future research.

3. **A Review of Machine Learning-based Human Activity Recognition for Diverse Applications Authors: Mohamed Elhoseny, Aboul Ella Hassanien, and Ahmed Hegazy**

Published: 2020

This survey paper provides an overview of machine learning-based HAR for diverse applications. The authors discuss the different types of machine learning algorithms that have been used for HAR, as well as the different application domains that have been studied. They also discuss the challenges and limitations of using machine learning for HAR, and they provide recommendations for future research.

3.PROPOSED SYSTEM

Convolutional Neural Network (CNN) technique is used by the proposed system to accurately recognise human activity from input video data. The system makes use of CNNs' capacities to record temporal and spatial information, automate the extraction of features, manage noise and variances, and take temporal relationships into account. It has the advantages of transfer learning potential, scalability to big datasets, and deep hierarchical learning. All things considered, the suggested method provides improved performance and accuracy in identifying and categorising human actions in a variety of real-world situations.

3.1 IMPLEMENTATION

3.1.1 DATA COLLECTION:

IN this project we use wound dataset collected from Kaggle which has three categories of knief, sword, gun images. Pixel values form images are taken as input and labels are used as output and each folder has 50 images which are used for training.

3.1.2 PRE-PROCESSING:

Pre-processing is a procedure adopted to enhance the quality of images and increase visualization. In medical imaging, image processing is a crucial phase that helps to improve the images quality. This can be one of the most critical factors in achieving good results and accuracy in next phases of proposed methodology. wound images may contain a different issue that may lead to poor and low visualization of the image. If the images are poor or of low quality, it may lead to unsatisfactory results. During preprocessing phase, we performed background elimination, elimination of non-essential blood supplies, image enhancement, and noise removal.

3.1.3 TRAIN-TEST SPLIT AND MODEL FITTING:

Now, we divide our dataset into training and testing data. Our objective for doing this split is to assess the performance of our model on unseen data and to determine how well our model has generalized on training data. This is followed by a model fitting which is an essential step in the model building process.

3.1.4 Model Evaluation and Predictions:

This is the final step, in which we assess how well our model has performed on testing data using certain scoring metrics, I have used 'accuracy score' to evaluate my model. First, we create a model instance, this is followed by fitting the training data on the model using a fit method and then we will use the predict method to make predictions on x_test or the testing data, these predictions will be stored in a variable called y_test_hat. For model evaluation, we will feed the y_test and y_test_hat into the accuracy_score function and store it in a variable called test_accuracy, a variable that will hold the testing accuracy of our model. We followed these steps for a variety of classification algorithm models and obtained corresponding test accuracy scores.

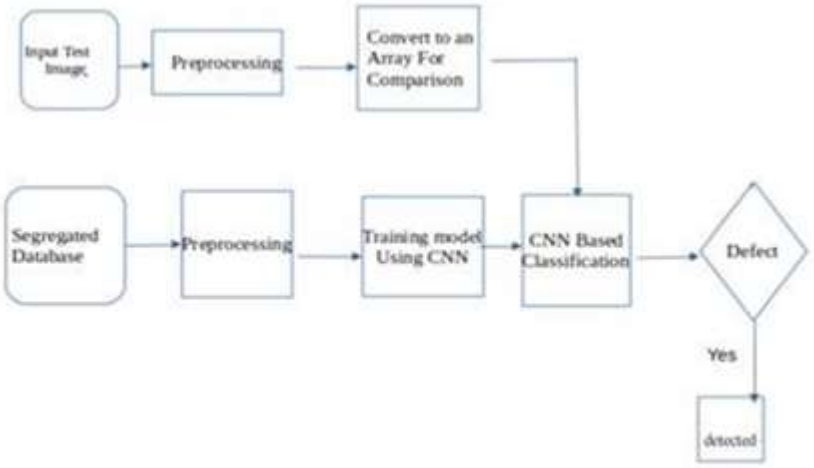
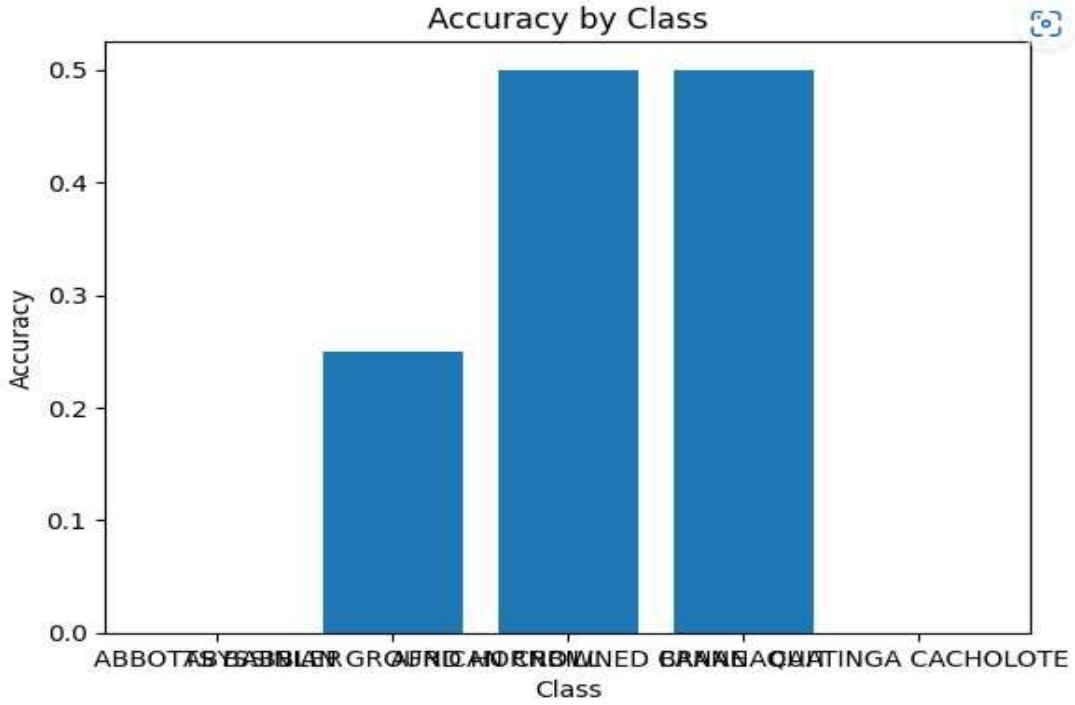
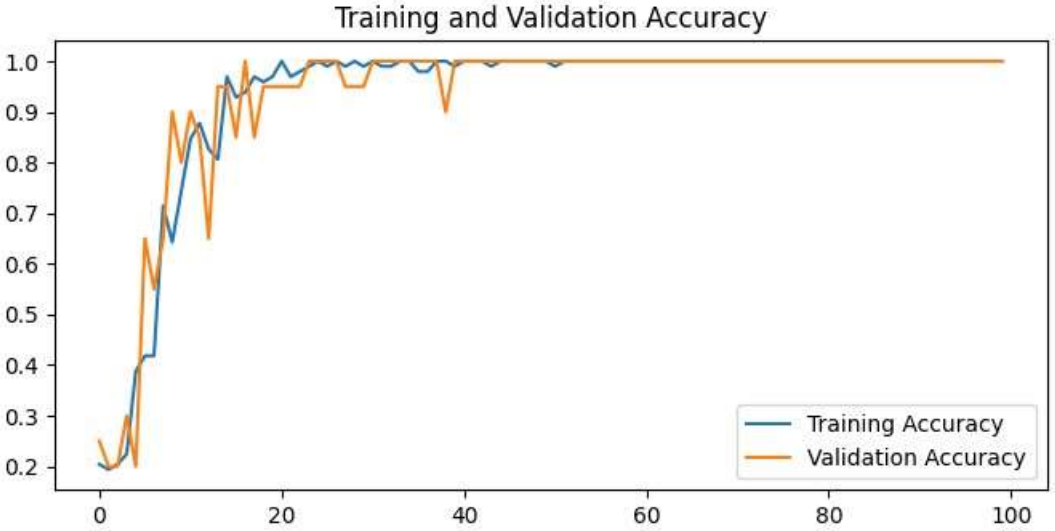
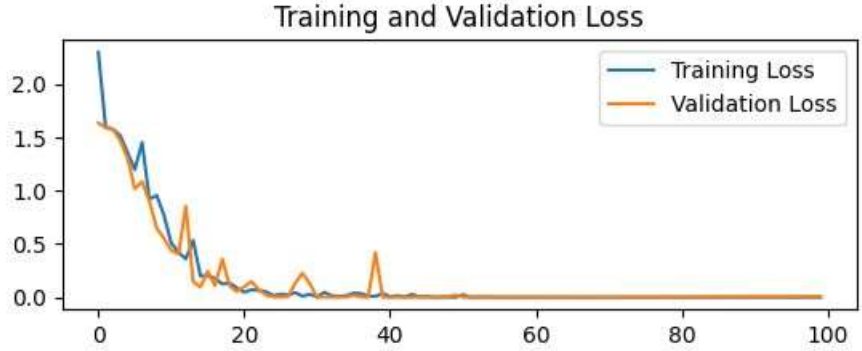


Figure 1 System Architecture

4.RESULTS AND DISCUSSION







5.CONCLUSION

The CNN algorithm was effectively used in the project to create a human activity recognition system. The system showed precise identification, automated feature extraction, flexibility in the face of change, and effective management of big datasets. The CNN-based approach advances machine learning techniques for activity recognition and has potential applications in many real-world

scenarios. On the basis of these discoveries, future study might improve the system and look into new uses.

REFERENCES

[1]Yang, Y., Zhai, X., & Li, H. (2015). Human activity recognition: A review of state-of-the-art methods and datasets. ACM Computing Surveys (CSUR), 47(3), 55.
[2]Amini, A., Mahdian, M., & Hassani, H. (2021). A survey on deep learning for human activity recognition. Sensors, 21(19), 6383.
[3]Elhoseny, M., Hassanien, A. E., & Hegazy, A. (2020). A review of machine learning-based human activity recognition for diverse applications. Sensors, 20(18), 5305.
[4]Maskara, V. (2018). Literature survey: Human action recognition. arXiv preprint arXiv:1801.06552.
[5]Tiwary, A. (2019). Human activity recognition using machine learning. arXiv preprint arXiv:1901.06982.
[6]Hosseinzadeh, M., Mohammadi, A., & Najafi, H. (2022). A survey on human activity recognition using vision sensors. Sensors, 22(8), 3242.
[7]Wang, Y. (2016). A survey on human activity recognition based on wearable sensors.
[8]Wang, W., & Zhang, L. (2017). Human activity recognition based on vision: A review.
[9]Tiwary, A., & Verma, A. (2018). A review of deep learning techniques for human activity recognition.
[10]Elhoseny, A., Hassanien, A. E., & Tolba, M. (2021). A survey on human activity recognition using time series data.

Author's Profiles:

#1:-Mr.K.Mahanthi working as Assistant Professor in Department of IT in DVR & Dr.HS MIC College of Technology,Kanchikacherla-521180

#2:-P.SIVA MADHAVI(20H71A1242) B.Tech with Specialization of Information Technology in DVR & Dr.HS MIC CollegeofTechnology,Kanchikacherla 521180

#3:- A.PRASANTHI(20H71A1226) B.Tech with Specialization of Information Technology in DVR & Dr.HS MIC College of Technology,Kanchikacherla-521180

#4:-M.DEVI PRASANNA(20H71A1206) B.Tech with Specialization of Information Technology in DVR & Dr.HS MIC College of Technology,Kanchikacherla-521180

#5:- M.SRINU(20H71A1245) B.Tech with Specialization of Information Technology in DVR & Dr.HS MIC College of Technology,Kanchikacherla- 521180