IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 5, March 2024

An Approach Towards Activity Recognition using AI and ML

Soniya Rajendra Binnod and Dr. Amit K Gaikwad
G. H. Raisoni University, Amravati, India

Abstract: *The study of correctly identifying human actions that are put to various tests is known as "human activity recognition."Human activity is the constant flow of one or more discrete actions that are necessary for advancement. A series of activities in which an individual enters a room, moves ahead, sits down, stands up, etc. is a specimen of human activity. Human activity recognition can be carried out at many abstract levels and has broad applications in the actual world, such as activity-based search, monitoring of critical sites, patient monitoring, etc. the years, researchers, engineers, and students from all across the world have explored the identification of human action.YoloV4 and DarkNet are two computer vision algorithms used in machine learning-based activity recognition that identify the actions that are performed.*

Keywords: Human activity

I. INTRODUCTION

The study of correctly identifying human actions that are put to various tests is known as "human activity recognition." Human activity is the constant flow of one or more discrete actions that are necessary for advancement. A series of activities in which an individual enters a room, moves ahead, sits down, stands up, etc. is a specimen of human activity. Human activity recognition can be carried out at many abstract levels and has broad applications in the actual world, such as activity-based search, monitoring of critical sites, patient monitoring, etc. across the years, researchers, engineers, and students from all across the world have explored the identification of human action. YoloV4 and DarkNet are two computer vision algorithms used in machine learning-based activity recognition that identify the actions that are performed.

1.1 Objective & Future Scope

Building intelligent systems requires an understanding of human behavior and how it interacts with the environment. The field of human action recognition addresses the issues brought about by the combination of sensing and reasoning in order to produce context-aware data that can offer tailored support throughout an application. There are still a number of issues with the human action recognition system that need to be resolved, such as privacy concerns about ongoing activity monitoring, challenges with real-time HAR (human activity recognition), and a lack of fully ambient systems that can reach users at any time. Recognizing human activity is an extremely important monitoring system. The goal of human action detection is to examine exercises from still images or video sequences. The ongoing development of deep learning and artificial intelligence algorithms not only makes it easier to communicate and obtain crucial physiological indications for medical professionals, but it also makes quantification easier, which boosts the effectiveness of patient monitoring systems. Not only does human activity recognition benefit patients in the medical field, but it also has broad applications. For increased security, the active or smart system can monitor its residential neighborhood using HAR technology. Our findings may potentially be used to provide older folks with health benefits, medical assistance, and other security-related needs for vital infrastructure. We found this to be highly intriguing since we were going to develop an intelligent system that would

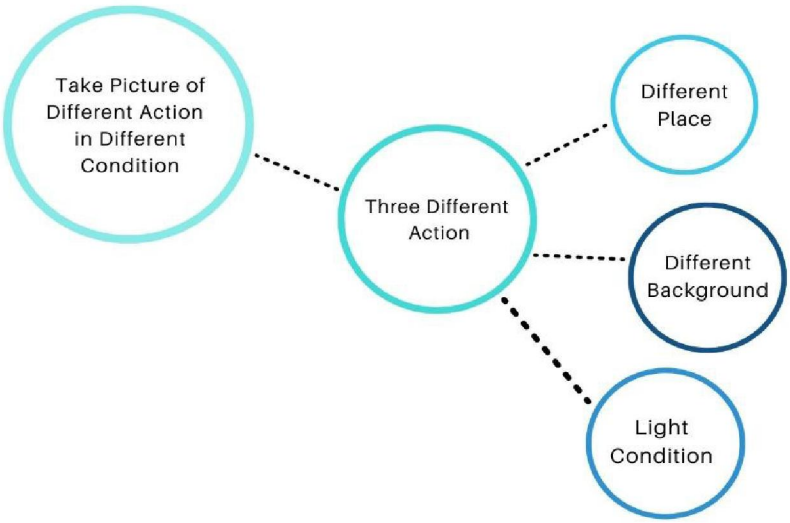
1.2 Algorithm:

Yolo is an algorithm that provides real-time object detection using neural networks.
The accuracy and speed of this algorithm make it popular.
It has been applied to the detection of people, animals, parking meters, and traffic signals in a variety of ways.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 5, March 2024

1.4 Data Collection Process:

In addition to the hospital and other environments, we had to gather a lot of data in a variety of conditions, with a complicated background and surrounding. so that we can get the utmost accuracy possible from this project wherever it is. We split off into distinct groups because of this. We split out into three groups in an attempt to collect as much data as we could.

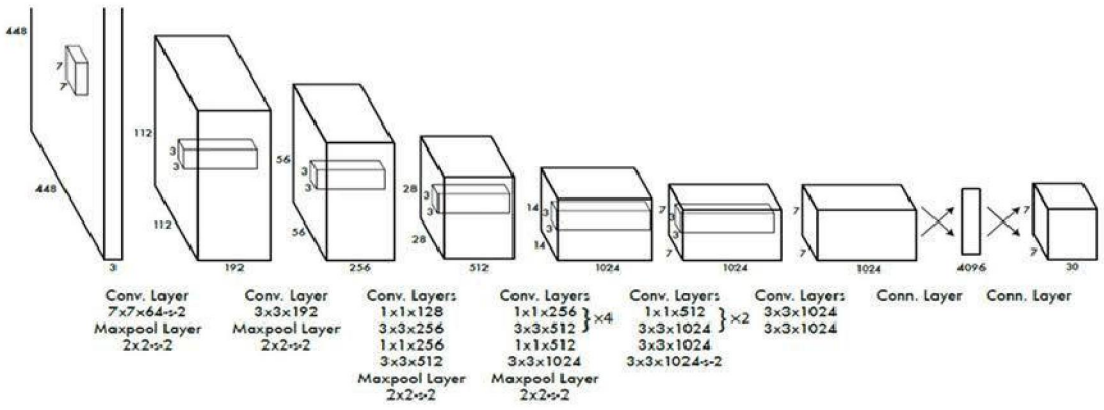


Taking Pictures of the Frames: A video input's human motions are split up into frames at specific time intervals. By grouping these frames into distinct action classes, the CNN model is able to recognize patterns that are similar to one another.

Dataset: To anticipate and compare the input data, 400 human behaviors make up the Coco dataset. YouTube recordings are the source of the Coco dataset. The activities are human-centered and. Compared to training and tuning it separately, working with the pre-trained model will be simpler and yield more accurate results.

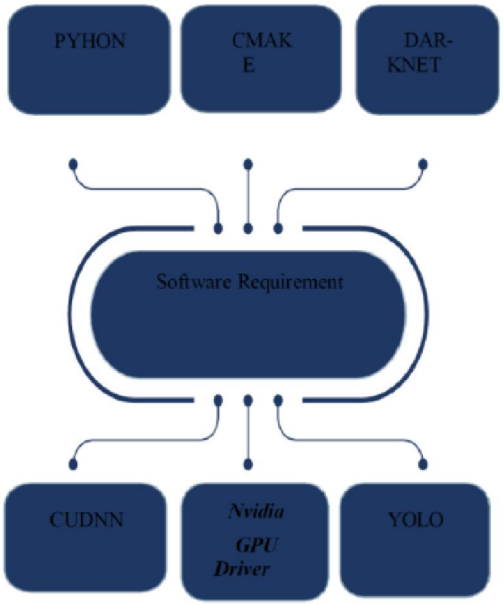
1.5 YOLO detection architecture:

We will talk more about YOLOv4 and its design in this article. Every YOLO data model is a dataset for activity and object detection. The purpose of the datasets is to train the system to find a subset of object classes.



IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 5, March 2024

Software Requirement



II. FUTURE SCOPE

Recognizing activities serves as the foundation for the creation of numerous prospective applications in sports, fitness, and health. Utilizing data gathered from various sensors, HAR can be used to analyze an individual's activity in order to monitor their health. The variables that govern which activity a human performs are found through the application of HAR, which finds similar patterns. Robotic automation using HAR facilitates the process of teaching a robot to As a result, the classification for that specific action instantly ends. In order to detect increasingly complicated human actions, we will also concentrate on enhancing action recognition with the use of object detection in frames. Additional details about the action in the video can also be found by measuring the Euclidean distance between a human and the center of a moving object or by tracking the movement of things.

III. CONCLUSION

The suggested report focuses on using computer vision to forecast what will happen in videos. This focuses on employing image processing techniques to recognize basic activities such as everyday activities. The motivation needed to accurately and quickly identify human behavior will be supplied by this study. We evaluated a continuous approach for identifying human movements in complicated settings, with a picture layout based on YOLOv4 (You Only Look Once). The methods validated using ourin our manuscript. We intend to add more features to this project in the future that will improve its usability and completely transform the human activity monitoring system. Every structure has been designed with openings for future development in mind. This framework will be faster and more effective in the future. Reduction in handling time is one of the major problems.

REFERENCES

[1]. J. Redmon, "YOLO: Real-Time Object Detection," 2020.* Pjred-die.com [online].Accessible at: ¡https://pjreddie.com/darknet/yolo/·[As of December 6, 2020]..

[2]. Maintaining the 2016 Ranked Keyword Search Method2. "In the next years, the amount of data generated by n ew surveillance cameras will grow exponentially."[Online, 12 Mar. 2018 Accessed].a website called SecurityI nfoWatch.comproduced by new surveillance cameras to rise dramatically in the upcoming years

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 5, March 2024

[3]. You Only Look Once: Unified, Real-Time Object Detection, by J. Redmon, S. Divvala, R. Girshick, and A. Farhadi, 2016 IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Las Vegas, NV, pp. 779-788.10.1109/CVPR.2016.91 is the doi.

[4]. Evaluation of video activity localizations integrating quality and quantity data by C. Wolf, J. Mille, E. Lombar di, O. Celiktutan, M. Jiu, E.Dogan, G. Eren, M. Baccouche, E. Dellandrea, C.E. Bichot, C. Garcia, B. Sankur, I n Computer Vision and Image Understanding (127):14-30, 2014...

[5]. Xiaoou, Yu Qiao, and Limin WangTang. Using trajectory-pooled deep-convolutional descriptors for action recognition.In CVPR, 2015, pp 4305–4314.

[6]. "Hierarchical monothetic document clustering algorithm for summarization and browsing Search results," in P roc. Int. Conf. World Wide Web, 2004, pp. 658–665, by K. Kummamuru, R. Lotlikar, S. Roy, K. Singal, and R. Krishnapuram.

[7]. "Selforganization of a massive document collection," by T. Kohonen, S. Kaski, K. Lagus, J. Salojarvi, J. Honk ela, V. Paater, and A. Saarela, IEEE Trans. Neural Netw., vol.11, no. 3, pp. 574–585, 2000.

[8]. Keyword selection method for characterizing text document maps," by K. Lagus and S. Kaski, in International Conference on Artificial Neural Networks (ICANN), 1999, pp. 371–376

[9]. "Inductive learning algorithms and presentations for text categorization," by S. Dumais, J. Platt, D. Heckerman , and M. Sahami, in Proc.International Conference on Information Management, 1998, pp. 148–155.

[10]. "Wrappers for feature subset selection," R. Kohavi and G.H. John, Artif. Intell., vol.97, no.1, pp. 273-324, 1997