**HUMAN ACTIVITY RECOGNITION-VISION BASED APPROACH**

Introduction:

Human activity recognition plays a significant role in human-to-human interaction and interpersonal relations. Because it provides information about the identity of a person, their personality, and psychological state, it is difficult to extract.

The goal of human activity recognition is to examine activities from video sequences or still images. Motivated by this fact, human activity recognition systems aim to correctly classify input data into its underlying activity category!

Depending on their complexity, human activities are categorized into:

1. gestures
2. atomic actions
3. human-to-object or human-to-human interactions
4. group actions
5. behaviors
6. events.

It can also visualizes the decomposition of human activities according to their complexity.

Literature survey:

# Vision-based human activity recognition

This paper attempts to review and summarize the progress of HAR systems from the computer vision perspective. The current survey aims to provide the reader with an up to date analysis of vision-based HAR related literature and recent progress in the field. At the same time, it will highlight the main challenges and future directions.

Human Activity Recognition Using Gait Pattern

Vision-based human activity recognition is the process of labelling image sequences with action labels. Here the authors propose an approach to recognize the human activities through gait. Activity recognition through Gait is the process of identifying an activity by the manner in which they walk.The authors contribute the use of Model based approach for activity recognition with the help of movement of legs only. Experimental results suggest that their method are able to recognize the human activities with a good accuracy rate and robust to shadows present in the videos.

# Vision Based Human Activity Recognition

With the wide applications of vision based intelligent systems, image and video analysis technologies have attracted the attention of researchers in the computer vision field. In image and video analysis, human activity recognition is an important research direction. By interpreting and understanding human activity, we can recognize and predict the occurrence of crimes and help the police or other agencies react immediately. In the past, a large number of papers have been published on human activity recognition in video and image sequences. In this paper, we provide a comprehensive survey of the recent development of the techniques, including methods, systems, and quantitative evaluation towards the performance of human activity recognition.

# Synthetic Training for Accurate 3D Human Pose and Shape Estimation in the Wild

# This paper addresses the problem of monocular 3D human shape and pose estimation from an RGB image. Despite great progress in this field in terms of pose prediction accuracy, state-of-the-art methods often predict inaccurate body shapes. We suggest that this is primarily due to the scarcity of in-the-wild training data with diverse and accurate body shape labels.

Detecting Attended Visual Targets in Video

We address the problem of detecting attention targets in video. Our goal is to identify where each person in each frame of a video is looking, and correctly handle the case where the gaze target is out-of-frame. Our novel architecture models the dynamic interaction between the scene and head features and infers time-varying attention targets.

Analysis of Human Action and Trajectory Prediction in Video

Humans navigate complex crowded environments based on social conventions: they respect personal space, yielding right-of-way and avoid collisions. In our work, we propose a data-driven approach to learn these human-human interactions for predicting their future trajectories.We demonstrate the performance of our method on several public datasets. Our model outperforms previous forecasting methods by more than 42% . We also analyze the trajectories predicted by our model to demonstrate social behaviours such as collision avoidance and group movement, learned by our model.

# Dynamics of Loneliness among Older Adults During the COVID-19 Pandemic: Pilot Study of Ecological Momentary Assessment with Network Analysis

EMA ratings of loneliness were moderately correlated with UCLA loneliness scale scores. Network models showed that loneliness was

contemporaneously associated with negative affects like worried etc . Negative mood tended to be followed by loneliness and then by exercise or outdoor physical activity.

Neural Responses to Rapid Fcila Expressions of Fear and Surprises

Amygdala and parahippocampal gyrus form an important part of the emotion network and play a very vital role in the recognision of fear and surprise faces

These results suggest that fear leads to greater activation of the attention and memory systems, whereas surprise results in greater activation of the emotion experience system.

# Vision-Based Human Tracking and Activity Recognition

# The protection of critical transportation assets and infrastructure is an important topic these days. Transportation assets such as bridges, overpasses, dams and tunnels are vulnerable to attacks.This research was developed in two parts: trackingpedestrians and capturing pedestrian images and pedestrian

# activity recognition based on position and velocitySensor-based and vision-based human activity recognition

This survey analyzes the latest state-of-the-art research in HAR in recent years, introduces a classification of HAR methodologies, and shows advantages and weaknesses for methods in each category.

Model

CNN is a type of deep learning model for processing data that has a grid pattern, such as images.CNN is mainly used in image analysis tasks like Image recognition, Object detection & Segmentation.

Very Deep Convolutional Networks for Large-Scale Image Recognition(VGG-16) The VGG-16 is one of the most popular pre-trained models for image classification.

Image classification techniques can mainly be divided into two different categories: pixel-based classification and object-based classification. Pixels are the base units of an image, and the analysis of pixels is the primary way that image classification is done.

VGG16 is object detection and classification algorithm which is able to classify 1000 images of 1000 different categories with 92.7% accuracy. It is one of the popular algorithms for image classification and is easy to use with transfer learning.

VGG-16 is considered to be one of the excellent vision model architecture till date

Results

HAR has been widely used for various applications such as human-computer interaction systems HCI, computer vision and augmented reality.

the recognition of human activity from static images or video sequences has several potential applications in many fields. Examples of human activity recognition applications include monitoring and evaluation of processes in industry as well as machines and devices control , fraud detection, extraction of information from videos , video assistance and surveillance and public security where crowds’ movements are tracked to detect violent or criminal situations. Given the increasing involvement of robots in our life, it is essential to equip them with the ability to understand intentions, emotions and behaviors of individuals.

Finally, other applications of HAR systems touch in medical environments to ensure surgical operations or patient monitoring, interpretation of language signs as well as supervision of medication

Conclusion

Human activity recognition remains to be an important problem in computer vision Our project is aimed towards recognizing activity like talking, eating, drinking, etc. by understanding the head and body pose of humans . Though a hard problem, this will be open up many prospects towards understanding and modeling human actions for various real-life applications.

HAR is the basis for many applications such as video surveillance, health care, and human-computer interaction.HAR is the basis for many applications such as video surveillance, health care, and human-computer interaction

Though recent HAR approaches have achieved great success up to now, applying current HAR approaches in real-world systems or applications is still nontrivial.

Abstract

Human activity recognition (HAR) aims to recognize activities from a series of observations on the actions of subjects and the environmental conditions. The vision-based HAR research is the basis of many applications including video surveillance, health care, and human-computer interaction (HCI). This review highlights the advances of state-of-the-art activity recognition approaches, especially for the activity representation and classification methods. For the representation methods, we sort out a chronological research trajectory from global representations to local representations, and recent depth-based representations. For the classification methods, we conform to the categorization of template-based methods, discriminative models, and generative models and review several prevalent methods. Next, representative and available datasets are introduced. Aiming to provide an overview of those methods and a convenient way of comparing them, we classify existing literatures with a detailed taxonomy including representation and classification methods, as well as the datasets they used. Finally, we investigate the directions for future research.