

Web Based Attendance Capturing System Using Semantic Segmentation

IJIMSR, Vol. 2, No. 1, (2024) 24.2.1.014

***Dr Praveen Kumar Yechuri**

Assistant professor

Vidya Jyothi Institute of Technology,
Hyderabad

Email: praveenkumar@vjit.ac.in1

Rajesh Yamparala

Assistant professor

Newtons college of Engineering,
Macherla

Email: rajeshyamparala@gmail.com

***Corresponding author**

Received 17th Feb 2024; Accepted 20th April 2024

KEYWORDS: Feature Extraction, Image Segmentation, Semantics, Resnet

Copyright@2024 EduSkills Foundation, All rights reserved.

Web Based Attendance Capturing System Using Semantic Segmentation

Dr Praveen Kumar Yechuri

Assistant professor
Vidya Jyothi Institute of Technology,
Hyderabad
Email: praveenkumar@vjit.ac.in

Rajesh Yamparala

Assistant professor
Newtons college of Engineering,
Macherla
Email: rajeshyamparala@gmail.com

ABSTRACT

Now a days taking of attendance has been a critical factors which is why the technological advancement have been getting larger the security features will indeed play a crucial part to minimise the fraudulent activity of modern trend in face recognition in conversely to further enrolment system framework like palmprint participation, iris participation capturing, log books attendance and the palm-based attendance etc has the supremacy in interaction free manner and currently it plays a key role in the pre-eminent technologies in enlargement. regardless of the fact that there are numerous attendances collecting systems that employs Biometric, Radio Frequencies in Domain of taking Attendance. A major face recognition viewpoint which is built upon the ResNet and The Semantic Segmentation has indeed been Introduced in the study.

In This study a residual learning strategy has entered play using a Segmentation procedure which create the networks considerably broader than the Preceding Networks. By incorporating the Innovation of the Semantic Segmentation As well as the Recurrent neural Architecture we can extract Even the pixel details. With the Support of ResNet Architecture we also incorporated the Skip connections in which we Issue related collection of the Images and performance the improvement by extraction of features and once the pathway is suited then we indicate the Attendance.

KEYWORDS: Feature Extraction, Image Segmentation, Semantics, Resnet

1. INTRODUCTION

The most typical approach of documenting attendance of students with the classroom is to have students register a log book, which is frequently distributed about in the lecture while a professor is presenting. For contrast, lecturers with a huge class may find it burdensome to have the data recorder dispersed about in the lecture and for students to physically verify actual attendance, which

would probably likely disturb them from giving and obtaining entire concentration from the students. [1] Furthermore, when the attendance sheet is given all around class, some individuals may inadvertently or actively scribble the names of another youngster. The first long lasting in an intentionally misspelled student's name, but the latter one culminates in a fabricated attendance record.

Facing acknowledgment is deconstructed into two separated into two components: firstly, profiles are recognised; additionally, look of the images are collate with the present Table Alternative strategies of appearance characterization and detection have indeed been described. Face acknowledgement either employs a perceptual technique based on the characteristics that detects structural shape such as the full facial parts. Recognition software is a communications approach that can distinctions live human facets based on definition in digital images. Face alignment algorithms enable it to distinguish the facial emotions of real humans.

Another risk of preserving the attendance rate on document is the fact that attendance document may be abandoned by the presenter. [2] As an effect, the lecturer seems to be no anymore able to keep watch of the pupil's whole attendance record throughout the whole of semester. An instructor may also have restricted exposure here to solely duplicate a material, for example, simply at work. In respect to enrolment monitoring, the professor needs additionally do manual calculation to compute the pupils' membership percentage, that takes time. Since highlighting the inadequacies of the typical student enrolment recording device, we propose an alternative that takes the form of an RFID-based exposure to new monitoring system. The system's basic assumption is to gather quality of teaching and learning semiautomatically, with students requiring to check their pupil id there at RFID reader on arrival to the classroom. The reader rapidly grabs the student Card, and the information is transmitted to a host machine for recording. [3] As deep learning advances, the CNN model beats traditional machine supervised learning in various digital information retrieval applications.

Facial recognition algorithm programs are being built in three domains at the instant: facial preparation (including image retrieval and detecting), semantic segmentation (chiefly via the creation of ANN structures), and feature classification. Facial affirmations and facial proof are two detritivores of universal Identity Verification. The former separates profile into various groups, while the hindmost examines whether two face image pairs possess the same identity. The automated face recognition approach involves face detection and location in a congested context, as well as fusion, recognition, and verification. Depending on the parameters of the application, various functions, which include the number of the testing and development records, basal volatility, opacity, skew, and unambiguous provision, may be tough to implement.

Presuming that standardization and segmented are utter, we focus approaching the sub - task of persons attestation and identification, establishing competence avail oneself of the sample directories of about 400 profiles. CNN is the most widely used profiles detection intelligent retrieval approach. The Visual Geometry Group (VGG-

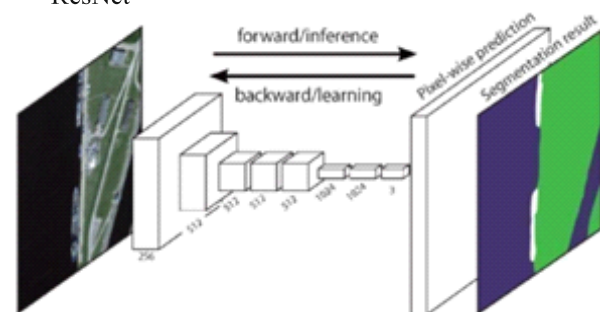
15) framework includes nineteen layers, while the ResNet matrix has five levels. The 100-films limit wasn't crossed as late as the emergence of nodes notably ResNet on the year 2016. By building a tiny link channel from the entry phase to the posterior level, the signal is carried directly across one heap to the next using ResNet. Although there are several Neural Network based recognition of facial expressions systems, their quality and usability are still inadequate for concrete applications. This study delivers a more accurate face remembrance system built on ResNet 152 v2 over current ones.

The characteristics in our technique do not need to be extracted manually since we deployed deep neural networks. Other methods or software utilise the data acquired from the central portion of something like the face to identify the person easily and accurately. Reinforcement learning could be utilized to develop a system that actually can train and make decisions independently without the need for data pre-processing. The basic objective of applying supervised learning is to allow machines to comprehend and make decisions without the necessity for social contact. It may gain information and expertise independently in order to make better choices, either by past training or through experience.

2. SEMATIC SEGMENTATION

Segmentation is a rational crossover among the coarse and fine deduction. The genesis may be found in segmented, which is a prediction of finishing an input. The next level is localization/detection, which supplies not only the classes but also geospatial data about them. Finally, semantic segmentation retains flawlessly okay detection and high ambitions indicating tags one per pixel, such that each data item is tagged with the classifications of the objects or areas that surround it. It is also important to check at different industry standards. Neural connections that have gained considerable breakthroughs to image retrieval and are frequently deployed as the bedrock of feature-based systems:

- Alexnet.
- VGG-16
- GoogLeNet
- ResNet

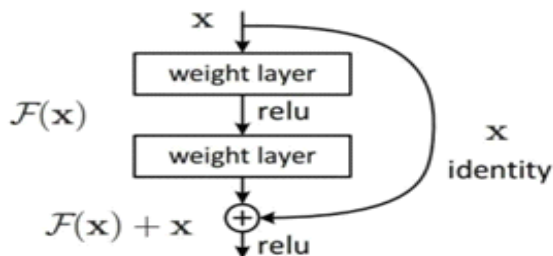


Segmentation Process

3. RESIDUAL NETWORK MODEL

Deep neural systems have recently permitted tremendous breakthroughs in image age generation, categorization, and other fields. Skip connections are utilised to hop over such levels over such Levels Nets may also find the forgo weight automatically employing a massive mass vector for its doorways Thruway Net may also be educated in the bypass vectors automatically using an updated vector matrix for their openings). Typical ResNet models are generated using cress - cross or unique sets layer skips that incorporate non - linearities (ReLU) with phase homogenisation somewhere in. Models with several simultaneous dropouts are called to as Dense Nets. Inside this context of residual neurons, a non-residual net may be viewed as a basic system.

The development of Resnet, which are composed entirely Residual Blocks, has reduced the strenuous of teaching extraordinarily expert system. You may educate levels with a big number of them utilising the residual training approach and still get great results. To put a stop on grouping accuracy drench occurred by multiple fully connected tires, ResNet learning preserves a fraction of the actual source information all over CNN unit instructing. In the meantime, the residual unit is not needed to keep the whole output; rather, it just needs to spot the variance now between load and source. which reduces the educational aims and challenges.



4. SCHEMATIC APPROACH

In a wide semantic segmentation architecture, a codec net is connected by a hidden layer. A post categorization circuit, such as VGG/ResNet, frequently acts as the transmitter, followed by a convolutional network. The Face Recognition algorithm is depending on the Integrated AI methodology.

The Integrated Artificial Intelligence technique is employed in mobile devices such as smartphone, surveillance systems, etc. This advanced grid has been highly professionally very profitable in recent years. The primary facial recognition approaches include feature selection method, Bayesian network, orthogonal faces, and autonomous face processing.

To achieve a dense classifier, the decoder must semantically transfer the encoder's taught image representation (surprisingly low pixel intensity) onto the picture pixels (greater resolution) (higher resolution).

- Semantic Differentiation Based on Region.
- Semantic Extraction Using a Study Ascertained Network
- Semantic Filtering with Limited Supervision

5. RELATED WORK

Arshi Husain and Virendra, P. Vishvakarma et al. [1] published Face Recognition Method Based on Residual Convolution Neural Network which delivers social security is far more crucial than ever considering advances in the IT area and sociological evolution. This selected startegy takes benefit of the AT&T face raw data, and presuming that modernisation and segmentation are complete, we concentrate on the deliverables of individual validation and acknowledgement. Angelo G. Menezes, Joao M. D. Da C Sa Eduardo Llapa

, Carlos A. Estombelo Montesco, et al. [2] established the Rapid Innovative Strategy utilizing Deep One-Shot acquisition, which shows that there is an intrinsic beneficial correlation among taking attendance and student achievement in the academic context. Mercel Vubangsi, Fadi Al-Turjman et al. [3] suggested the creation and implementation of a seminar attendance tracking system that relies on block chain technology and Artificial Intelligence (AI) technology. This system is constructed using react.js as its front-end and takes utilisation Google's legitimate database for storage.

B. Ashwini, R.P Vandana, P.S Venugopala et al. [4] leveraged the participants indicated which offered a solitary image-based face liveness detection approach for differentiating 2-D paper masks from the alive faces. Readily available computer vision and deep learning technologies like dlib, Keras are required for creating the face recognition quicker and accurate one. This renders the system appropriate in a real world settings. Kolipara Preethi , swathi menon et al. [5] suggested, The LBP approach (local binary pattern LBP) is adopted to assess quality of teaching and learning, and it is a widely used and efficient approach for image processing, which includes of Classification and representation. Dhanalakshmi, Narra, Saketi Goutham Kumar, Y. Padma Sai ,“ et al. [6] provided an Attendance Government where another scheme appears to be a framework that would be accomplished to remain at the forefront of genuine together with accountability in the management of genuine attendance of students using GSM-based portable fingerprint terminals (WFTs).

Mohd Ikhsan Moksini , Norizan Mohd Yasin et al. [7] suggested the inclusion of a Wireless Membership method in a Testing Procedure, which enables a predominant understanding of the procedure that makes it possible us to promote the unique duties that essentially allows individuals to work efficiently in standpoint of the company and is also by device digital technologies. Poornima S1 , Sripriya N2 , Vijayalakshmi B3 , Vishnupriya et al. [8] adopted a Prototype system which

is developed for maintaining a record of the live time together with transparency in the administration of scholar authentic participation utilising Gsm technology cordless thumbprint terminals (WFTs). Attendance records may be provided proper straight to children and their family mobile numbers using Mms system which allows us to send those reports.

Refik Samet, Muhammed Tanriverdi et al. [9] suggested the Facial Public acknowledgement Cellular Autonomous Lecture hall Student Attendance Management System which would be incorporates the customizable and simple true picture acknowledgment mobile attendance management software utilising the Smartphone apps. Zhongyun Jiang. Et al. [10] combining the RF identification innovation and wireless sensors network technology to record the history of the pupils' activities, it can give statistical information for the attendance of student's management

6. PROPOSED METHODOLOGY

In our post implementation, the ResNet Architecture integrated the ideas of Residual Blocks. We utilise a mechanism named as hidden neurons in this network. By bypassing specific levels somewhere between, the skipping connection ties level activations to consecutive layers with active terminals associate to them. The ResNet studies primary principle intend conserve a part of the inlay input data during CNN unit educating in order to minimise classing precision and congestion induced by several convolutional levels. Consequently, it is not essential for the residual component to remember the complete product ; alternatively, merely needs to comprehend the distinctions. Semantic segmentation is a somethings that deep learning algorithm would combine with a terminology with every pixel in an picture. It is enabled to identify a group of pixels that form various types of categories.

And seen between source and load, which optimises the learning goals and complexity. The authors overcome this issue by incrementally data augmentation the encoded information, inserting "skip connections" from convolution layer, and combining these two feature maps Hence connects skip connections across previous layers in the network before Than to the a quantization procedure should give the essential information in order to rebuild correct shapes for segmentation borders. Certainly, we can recover additional fine- grain data with the inclusion of these skip connections

A residual block is generated because of this. ResNets are constructed by layering these activation functions together. This network allows the system to suit the residual mapping instead of tiers understanding the underlying mapping. Semantic segmentation is therefore a natural step in the progression from large to fine

inference. The next level is localization/detection, which supplies not just the courses and also geospatial about them. Eventually, semantic segmentation shops completely acceptable interpretation and sparse estimates insinuating labelled for every pixel, so that each data object is analysed with the courses of the item core region that envelops it. It is also important to explore a few good neural learners that have contributed considerably to the area.

Advantages:

- a. Information is captured from diverse perspectives if indeed the resolution is adequate.
- b. It is reliable and error-free.
- c. A paperless workplace.
- d. We could tell these sets of twins apart.
- e: Obtaining Reliable Data

7. ALGORITHM

The system employs residual networks to solve the face recognition issue, and the notion of a ResNet-based algorithm for recognizing faces is depicted. In this study, the ResNet-based facial recognition algorithm is applied.

Step I: The colour photographs of the information in portable grey map form is included into the method and transformed to jpg format.

Step II: We partitioned the indigenous collection, which comprised 300 photographs in a 75 % is to the 25%, by two clusters defined as validation set and screening input data; accordingly, 240 images were taken to create the method and 120 images were utilised to test it.

Step III: We load its required components and establish a processing layer in front of RESTNET152V2.

Step IV: Model synthesis was conducted out employing three parameters: compressor, fuzzy system, and measurements.

Step V: The archetype was taught for employing the 'fit ()' function The three variables given below:

- The number of glaciations used
- The evaluation data
- The required output value

The residual block is theoretically represented as

$$R(p)q = R(p, \{W_i\}) + p$$

The input and result matrices of such tiers in question being x and y in this situation. This function reflects the residue translation to be computed as $R(p, W_i)$.

The residue block is formed up of numerous convolution layer, which have been illustrated as W_i .

The strength layer count ought to be bigger higher than one. The 2 tires of the thick cube may be represented utilising the corresponding Representation:

$$R(p, \{W_i\}) = W2\sigma(W1p)$$

In which σ gives the activation function for the Rectified Component. So, $H(p) = \sigma(q)$

8. RESULT

Students were mandated to remain there in conversation, and monitors were employed to picture them. There we examined a meeting of twenty youngsters with strength. nine Pupils were inserted, and a non- intersecting image was recorded with four Pupils staring into the camera and two extra Pupil apparently engaging the webcam. Students were instructed to posture in different ways, ranging with and without glasses, owning or lacking a scarf to surround their faces, owning and lacking a moustache or even beard, and owning and lacking a finger on cheeks or around the chin and having a movement in face or the body. Moreover, pupil are not constrained with anticipated such as, carrying a helmet, altogether covered face half wrinkling forehead, napping on the dusk, apparently proceeding away from the lens. The photos (faces) preserved in the testing subfolder are evaluated each one independently with each of the shots (faces) employed for training the right connection of the profile resulted in the pupil becoming active in the room. The surviving mis-matched images in the photographs in the training data are classified as lacking of the pupil in the class, and their missing is validated by aural sense by making a voice speak out each of the identities of the absentees

Student Name	Attendance	Recognition Correct/Incorrect
Nandu	Absent	Incorrect
Poojetha	Present	Correct
Aishwariya Nair	Absent	Incorrect
Vaishali	Present	Correct
Noorjahan	Present	Correct
Gokul	Absent	Correct
Manoj	Present	Correct
Dhanish	Present	Correct
Aishwariya	Present	Correct
Aishwariya Nair	Present	Correct
Varshini	Present	Correct
Varalakshmi	Present	Correct

Genuine Acceptance Rate (GAR) for face recognition system.

9. CONCLUSION

This research proposes a depiction in an instantaneously Web Based Attendance Capturing System that delivers Attendance using Facial Recognition Prototype Using ResNet. A Residual Network Variant is the ResNet 153v2. Our 152-layer ResNet is less complex and has more accuracy than competitors. It enables us to

encounter the data form various places and at various positions. It provides us with a design and a structure for tracking Attendance, resulting in an efficient solution with process controlling is also done. After receiving fantastic results for numerous experimental examinations of such approaches, they also have an exceptional outcome for posture fluctuations, lighting, and angle variations. It is less time-consuming to run the complete picture using this strategy.

REFERENCES:

- [1] Angelo G. Menezes, Joao M. D. Da C Sa Euardo Llapa, Carlos A. Estombelo Montesco, "Design and Implementation of the a Student Attendance System Using Iris Biometric Recognition System", 2019
- [2] Arshi Husain and Virendra P. Vishvakarma, "Face Recognition Method Based on Residual Convolution Neural Network", 2022
- [3] B. Ashwini, R.P Vandana, P.S Venugopala, "Neural Network based Biometric Attendance System", 2021
- [4] Kolipara Preethi, swathi menon, "Cloud-based Web Application with NFC for Employee Attendance Management System", 2018
- [5] Mercel Vubangsi, Fadi Al-Turjman, "Design and Implementation of a Conference Attendance Monitoring System Using Blockchain and AI Technologies", 2022
- [6] Mohd Ikhsan Moxsin, Norizan Mohd Yasin, "The Implementation of Wireless Student Attendance System in an Examination Procedure", 2018
- [7] Narra Dhanalakshmi, Saketi Goutham Kumar, Y. Padma Sai, "Aadhaar Based Biometric Attendance System Using Wireless Fingerprint Terminals", 2020
- [8] Poornima S1, Sripriya N2, Vijayalakshmi B3, Vishnupriya, "Attendance Monitoring System using Facial Recognition with Audio Output and Gender Classification", 2019.
- [9] Refik Samet, Muhammed Tanriverdi "Face Recognition-Based Mobile Automatic Classroom Attendance Management System"
- [10] Zhongyun Jiang, "Analysis Of Students Activities Trajectory And Design Of Attendance Management Based On Internet Of Things", 2016