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IDENTIFICATION OF MISSING PERSON IN THE CROWD USING PRETRAINED NEURAL NETWORK

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Abstract - *The proposed work deals with the identification of a missing person in the crowded area such as festivals, temples, public places, meetings, etc. Nowadays identification of a particular person in the crowded area is a complex task. For this, a solutionis provided on this with the help of a deep learning concept. Convolutional Neural Network (CNN) is employed for the identification of a person. The missing person is identified using various facial features. Face Detection plays an important role in this project. AlexNet which competed in the ImageNet Large Scale Visual Recognition Challenge is used. The primary result was that the depth of the model was essential for its high performance, which was computationally expensive but made feasible due to the utilization of graphics processing units (GPUs) during training. By providing training with various images it is possible to find the specified object in the target area. The flow of the project is getting the live-streamed video. The faces in the video are cropped and stored in the database. The people who need to identify has a dataset with several images. The AlexNet is trained by configuring several layers with our own dataset. The database images are classified by using the pretrained network to identify the presence of a person in the crowd. Further, the position of the person should be obtained and provide live tracking with the KLT algorithm.*

1. INTRODUCTION

Identification of a missing person in the crowded scene such as festivals, temples, public places, and meetings is a complex task. A solution with the help of deep learning concept is to be proposed. Pretrained Convolutional Neural Network (CNN) is employed for the identification of a person. The Convolutional Neural Network indicates that the network employs a mathematical operation called convolution. Convolution is a specialized kind of linear operation. Convolutional networks are simply neural networks that use convolution in place of general matrix multiplication in at least one of their layers. AlexNet contained eight layers, the first five were convolutional layers, some of them followed by max-pooling layers, and the last three were fully connected layers. It used the non-saturating ReLU activation function, which showed improved training performance over tanh and sigmoid. The layers are trained based on our requirement to identify the particular object. The last convolution layer and fully connected layers are configured to our requirement.

2. LITERATURE SURVEY

The idea for the project was erected from the papers that were glimpsed is listed below. However, an original plan in design uses some differential way from the papers mentioned below. A. Agarwal and B. Triggs[1] proposed a new technique to extract the features of the image. By the new technique, more features are extracted compared to the old technique. The new technique used multilevel image coding for extracting the features of images. X. Cao, Y. Wei, F. Wen, and J. Sun [2] developed an approach that says replacing the old technique for aligning the shape of the face with aligning the face by explicit shape regression. Using this aligning the shape of the face becomes very easy. D. Chen, S. Ren, Y. Wei, X. Cao, and J. Sun [3] proposed a new technique for the detection and alignment of face. In this technique detection and alignment of the face done in one process because joint cascade is used for the detection and alignment of face.

D. Eigen and R. Fergus [4] proposed that Predicting depth, surface normals and semantic labels with a common multi-scale convolutional architecture. P. Felzenszwalb, R. Girshick, D. McAllester, and D. Ramanan [5] proposed a new model that can able to detect the object i.e Object detection with discriminatively trained part-based models. R. Girshick, J. Donahue, T. Darrell, and J. Malik [6] Extracting the features is very important so that they proposed to extract more features from the image so that they highly focused the rich feature hierarchies for accurate object detection and semantic segmentation.N. Hu, W. Huang, and S. Ranganath [7] proposed that by the position of the head in the image it is very easy to embed and map the image so they proposed an estimation for the position of head by non-linear embedding and mapping. Y. Jia, E. Shelhamer, J. Donahue, S. Karayev, J. Long, R. Girshick, S. Guadarrama, and T. Darrell [8] proposed a new architecture for the embedding process because the old architecture is not working properly to embed because of fast feature embedding so that they proposed a new Convolutional architecture for fast feature embedding.

A. Kumar, R. Ranjan, V. Patel, and R. Chellappa [9] proposed a method which aligns the face with the help of regression. L. Liang, R. Xiao, F. Wen, and J. Sun [10] developed an approach that says replacing the old technique for aligning the shape of the face

with a component-based discriminative search. J. Long, E. Shelhamer, and T. Darrell [11] proposed that Fully convolutional networks for semantic segmentation. Q. Zhao, S. S. Ge, M. Ye, S. Liu, and W. He, [12] proposed that Learning saliency features for face detection and recognition using the multi-task network. M. D. Zeiler and R. Fergus[13] In this proposed system it says how to understand the convolutional network and how to visualize it. Y. Gong, L.Wang, R. Guo, and S. Lazebnik, [14] proposed that Multi- scale orderless pooling of deep convolutional activation features. A. Babenko, A. Slesarev, A. Chigorin, and V. Lempitsky [15] proposed a new method to retrieve the image so that the original image can be retrieved so that some new codes are proposed for the image retrieval i.e. Neural codes for image retrieval.A. Eitel, J. T. Springenberg, L. Spinello, M. Riedmiller, and W. Burgard [16] proposed that Multi modal deep learning for robust RGB-D object recognition.

3. PROPOSED WORK

The aim of this project is to identify the person who is missing in the crowded area using the drone which is having the camera and by this the person who is missed in the crowd will be easily identified within a minute. This will be very useful for the police to find the missing person. Nowadays many children are missing in the festival crowd so that by this project the police can monitor from one place and then they can able to find the person and also they can live track the person where he is moving so that they can save the time and can able to identify the missing person very easily

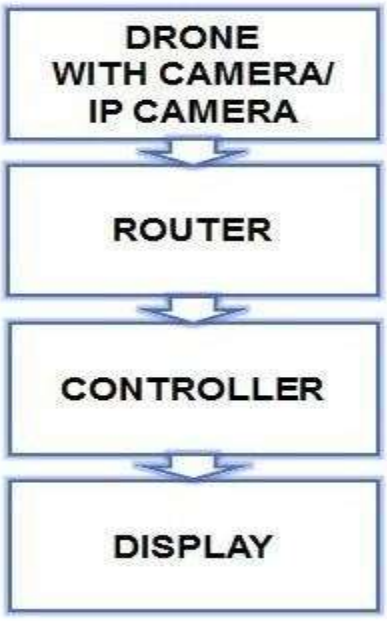

Fig – 1 Block Diagram of Proposed Work

First, the images of missing persons are collected. Each and every image should be from different angles so that identification will be so simple. After collecting the images a dataset for the images should be created. Then it will be under the training process. For this process, AlexNet is used, which is a pretrained neural network. Then the camera which is attached on the drone will capture the video of the crowded area and it will be communicating with the router . In this project IP camera is used , it will be communicating with the help of the IP Address so that router is used to communicate. Then it will be given to the controller so that the captured image will undergo the cropping process. After cropping the image a database for the cropped image will be created. After the database is created the database will be used to train the network. After completing the training process testing is done in a classifier having only a softmax layer and if the image is detected means in the display the image will be shown.

4. RESULTS AND DISCUSSION

Fig - 2 Detection of the target with bounding box

The test image was given to the proposed system .The pretrained system trained with targets region of interest would detect the presence of target in given test image and mapping the target region with bounding box based on the highest score obtained from detection score mechanism of system .The detection score improves the confidence of the target to be detected and displayed in monitor. For further reference the system detects all the faces in the test images and crop their faces and store in database for manual checking process to improve the detection probability.

5. CONCLUSION

The Identification of Missing Person in the Crowd scene is one of the most important needs to ensure surveillance and safety of the people all over places. But unfortunately, the existing technology cannot provide sufficient information to find the target person in the crowd. In order to rectify the deficiency in existing system and to achieve the goal the proposed model is employed and ensure the higher probability of detection by including various automatic as well as manual method.

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