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FINDING MISSING PERSON BASED ON FACE RECOGNITION USING AI

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Abstract
The aim to Find missing persons based on face recognition using AI is a promising approach that can significantly improve the speed and accuracy of missing person searches. This project proposes a system that would help the police/authority by accelerating the process of searching missing persons using face recognition technology in video surveillance systems. When a person goes missing, the people related to the missing person can form a complaint with his/her mobile number along with the missing person image. After the complaint is checked by respective police/authority, the surveillance video is uploaded with their locations and AI algorithms are used to find the match between facial images of missing person and the real-time video footage from surveillance cameras. The system involves collecting data about the missing person, building a database of facial images, and using AI algorithms such as HAAR cascade and Convolutional Neural Network to match those images with real-time video footage. If a
match is found, it will be notified to the people related to the missing person. The system can be implemented in public spaces, such as airports and train stations, to quickly identify and locate missing persons, thereby increasing the likelihood of successful reunions.
Keywords:Deep Learning, HAAR Cascade, CNN algorithm.

I. Introduction

Artificial intelligence (AI) is a field of computer science that aims to develop intelligent machines that can perform tasks that typically require human intelligence. AI systems are designed to learn from data, using machine learning algorithms that allow them to improve their performance over time. Finding missing persons based on face recognition using AI is a promising approach that can significantly improve the speed and accuracy of missing person searches. This project proposes a method for finding missing persons using face recognition technology in video surveillance systems.The system involves using AI algorithms to match facial images of missing persons with real-time video footage from surveillance cameras. The system involves collecting data about the missing person, building a database of facial images, and using AI algorithms to match those images with real-time video footage. HAAR cascade and Convolutional Neural Network (CNN) algorithm are used for facial recognition and matching facial features. CNN is a deep learning algorithm that is widely used for image recognition and classification tasks, making it suitable for face recognition. Artificial neural networks with many layers, enabling AI systems to recognize complex patterns and make accurate predictions. The system can be implemented in public spaces, such as airports and train stations, to quickly identify and locate missing persons. Finding missing persons based on face recognition using Convolutional Neural Network (CNN) algorithm is a popular approach that has shown promising results.

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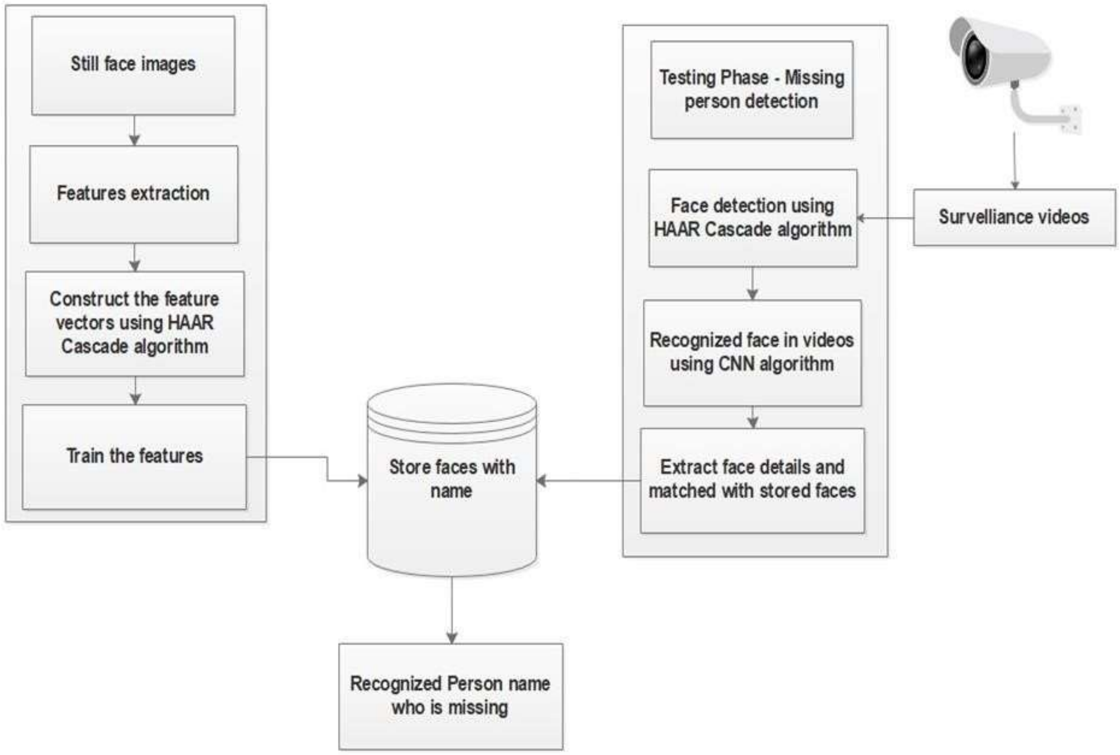

Figure 1:shows the Proposed Architecture Diagram

It An allocated arrangement of physical elements which provides the design solution for a consumer A system architecture or systems architecture is the conceptual model that defines the structure, behaviour, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviours of the system. System architecture can comprise system components, the externally visible properties of those components, the relationships (e.g., the behaviour) between them. It can provide a plan from which products can be procured, and systems developed, that will work together to implement the overall system. There have been efforts to formalize languages to describe system architecture; collectively these are called architecture description languages (ADLs).

Various organizations define systems architecture in different ways, including:

- Product or life-cycle process intended to satisfy the requirements of the functional architecture and the requirements baseline.
- Architecture priorities for future purchases, and a plan for upgrading and/or replacing dated equipment and software comprises the most important, pervasive, top-level, strategic inventions, decisions, and their associated rationales about the overall structure (i.e., essential elements and their relationships) and associated characteristics and behaviour.
- If documented, it may include information such as a detailed inventory of current hardware, software and networking capabilities; a description of long-range plans and

The composite of the design architectures for products and their life-cycle processes.

II. Literature

Xin Ning, Ke Gong, Weijun Li, Liping Zhang, Xiao Bai, Shengwei Tian [2020] Person re-identification, as a technology for retrieving specific person images from cameras in multiple nonoverlapping areas, has pivotal applications in the security field, including target tracking and person retrieval. In such tasks, the image pixels of the person are too low to be identifiable through face recognition. Moreover, the images have rather intricate backgrounds, which are also accompanied by occlusions and variations in person's poses. As cameras with disparate orientations normally have dissimilar viewing angles, the difficulty of person recognition is also increased thereby. Hence, person re-identification has invariably been a challenging task. The performance of person re-identification, which is a subtopic of image recognition, largely depends on the representation of a person's features. In recent years, image recognition has entered a new stage owing to multilayer convolution-based deep learning methods. This paper reports a feature selection network that combines global and local fine-grained features to realize person reidentification. The proposed model explores more valuable features by weakening the salient features, and obtaining diverse fine-grained features after eliminating interference information. Through experiments, the state-of-the-art performance of the Feature refinement and filter network on the mainstream datasets for person re-identification is verified.

Yiming Wu, Omar El Farouk Bourahla, Xi Li, Fei Wu, Qi Tian [2020]As an important and challenging problem in computer vision, person reidentification (Re-ID) aims at precisely retrieving the same identities from the gallery with a person of interest as a query given, and it has a wide range of applications in intelligent surveillance and video analysis. Typically, person ReID is carried out in the domain of individual images without capturing the temporal coherence information. Recent years have witnessed the remarkable progress of applying deep learning models in video person reidentification (ReID). A key factor for video person Re-ID is to effectively construct discriminative and robust video feature representations for many complicated situations. Partbased approaches employ spatial and temporal attention to extract representative local features. While correlations between parts are ignored in the previous methods, to leverage the relations of different parts, we propose an innovative adaptive graph representation learning scheme for video person Re-ID, which enables the contextual interactions between relevant regional features. Specifically, we exploit the pose alignment connection and the feature affinity connection to construct an adaptive structure-aware adjacency graph, which models the intrinsic relations between graph nodes. The proposed method can learn an adaptive structure-aware adjacency graph over the spatial person regions. By aggregating the contextual messages from neighbors for each node, the intrinsic affinity structure information among person feature nodes is captured adaptively, and the complementary contextual information is further propagated to enrich the person feature representations.

Xiujun Shu, Xiao Wang, Xianghao Zang, Shiliang Zhang, Yuanqi Chen, Ge Li, Qi Tian [2021]
Person re-identification (re-ID) in the scenario with large spatial and temporal spans has not been fully explored. This fact partially occurs because existing benchmark datasets were mainly collected with limited spatial and temporal ranges, e.g., using videos recorded in a few days by cameras in a specific region of the campus. Such limited spatial and temporal ranges make it hard to simulate the difficulties of person re-ID in real scenarios. In this work, we contribute a novel Large-scale Spatio-Temporal (LaST) person re-ID dataset, including 10,862 identities with more than 228k images. Compared with existing datasets, LaST presents more challenging and high-diversity re-ID settings and significantly larger spatial and temporal ranges. This work studies large-scale spatio-temporal person reidentification. This task has much larger spatial and temporal spans than previous settings. Our major contribution is the large-scale benchmark dataset called Last. It is the largest densely annotated re-ID benchmark and the first one to label clothes to date. By careful collection, the style of LaST is very similar to conventional re-ID datasets. Besides, we propose an simple but effective baseline that works well on such challenging person reID setting. By conducting extensive experiments, we demonstrate that LaST has good generalization ability in both short-term and cloth-changing scenarios. We believe that there is still much room for improvement in the large-scale

spatiotemporal settings. By releasing LaST, we expect this dataset to catalyze research in the re-ID community and propel the maturation of re-ID techniques in realworld applications.

Jiaxu Miao, Yu Wu, Yi Yang[2021] Person re-identification (re-id) is a popular computer vision task, which aims at searching people across nonoverlapping camera views at different times. Although recent approaches have achieved great progress, person re-id still suffers from large varieties of occlusions, pose, illumination, and so on. Occlusion is one of the main challenges for the person re-id since the occlusions introduce distractive information and confuse the re-id models. We focus on the occlusion problem in person reidentification (re-id), which is one of the main challenges in real-world person retrieval scenarios. Previous methods on the occluded re-id problem usually assume that only the probes are occluded, thereby removing occlusions by manually cropping. However, this may not always hold in practice. This paper relaxes this assumption and investigates a more general occlusion problem, where both the probe and gallery images could be occluded. The key to this challenging problem is depressing the noise information by identifying bodies and occlusions. We propose to incorporate the pose information into the re-id framework, which benefits the model in three aspects. First, it provides the location of the body. We then design a Pose-Masked Feature Branch to make our model focus on the body region only and filter those noise features brought by occlusions. Second, the estimated pose reveals which body parts are visible, giving us a hint to construct more informative person features. We propose a Pose-Embedded Feature Branch to adaptively re-calibrate channelwise feature responses based on the visible body parts. Third, in testing, the estimated pose indicates which regions are informative and reliable for both probe and gallery images. Then we explicitly split the extracted spatial feature into parts.
Houjing Huang, Wenjie Yang, Jinbin Lin, Guan Huang, Jiamiao Xu, Guoli Wang, Xiaotang Chen, KaiqiHuang[2020] Person re-identification is a fundamental task in video surveillance and smart retail, providing support for pedestrian retrieval and cross-camera tracking, etc. It aims to predict whether two images from different cameras belong to the same person. With large-scale datasets, as well as improved feature extraction and metric learning methods, recent years have seen great progress in this task. However, due to degraded image quality, pose and view point variation, etc., it still remains a tough problem. We reckon that the increased diversity between part features in turn spans a larger and more discriminative space for identification. Through Grad-cam visualization on MGN, we also discover that the proposed method helps ReID model to emphasize on more regions on human body. We believe that it reduces the risk of overfitting to salient body regions and facilitates learning comprehensive ReID features. Extensive ablation experiments are also conducted to analyse key factors of the proposed method, including part granularity in segmentation supervision, structure of the segmentation head, impact on each part, etc. From this perspective, we believe that the awareness of body parts should be an underlying capability of the model. However, in most existing methods, the model is merely supervised by identity labels. We argue that these models may be short of part sensitivity. To enhance such ability of a ReID model, we propose to train ReID with an additional task of part perception. Concretely, we connect a lightweight segmentation head to the backbone and supervise it with part labels, during the training of a normal ReID model

III. Conclusion

IIn conclusion, missing person detection using CNNs is a powerful tool that can help locate missing individuals by analysing images of them. The process involves collecting and pre-processing a dataset of images, building a deep learning model using a CNN, training the model, testing its accuracy, and deploying it for use in missing person detection. While this approach has several advantages, including its ability to accurately identify individuals in images even when there is partial occlusion or changes in lighting conditions, it also requires a large dataset for training, careful

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pre-processing, and expertise in deep learning. With continued advancements in deep learning and computer vision, missing person detection using CNNs has the potential to become an even more effective tool for locating missing individuals.One challenge in missing person detection is the availability of high-quality datasets. Future work could focus on improving the quality and size of available datasets to improve the accuracy of the models. Missing person detection often involves analysing images or videos taken at different times. Future work could focus on incorporating temporal information into the models to improve their ability to track individuals over time.

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