Towards Intelligent Attendance Monitoring for Scalable Organization with Hybrid Model Using Deep Learning

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Abstract

Face recognition technology using AI has seen paradigm shift in the evolving world. Automatic attendance monitoring using real-time face identification is a solution to handle attendance in any small/large as well as scalable organization. Traditional methods in the organization involve calling names or signing sheets with individuals,

which is a very time-consuming process and provides insurance. This is also subjected to manual errors. Automation of attendance recording and monitoring through face recognition is a process of identifying the face for taking attendance by using the image of the human face as biometric parameter captured through a surveillance camera in the premise. This article presents an effective way of attendance monitoring by making use of deep learning technology and compares its results with the state-of-the-art approaches.

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References

1. Han X, Du Q (2018) Face detection using deep learning as biometrics, combining the whole things relevant to the theory of deep learning and face detection technology. In: Sixth International Conference on Digital Information, Networking, and Wireless Communications (DINWC), Beirut

2. Oo SB, Myat Oo NH, Chainan S, Thongniam A, Chongdarakul W (2018) The 3rdInternational Conference on Digital Arts, Media and Technology (ICDAMT2018)

3. Georghiades AS, Belhumeur PN, Kriegman DJ (2001) From few to many: illumination cone models for face recognition under variablelighting and poses. IEEE Trans Pattern Anal Mach Intell 23(6):643–660

4. Chen L-C et al (2017) Deeplab: semantic image segmentation with deep convolutional nets, atrous convolution, and fully connected crfs. IEEE Trans Pattern Anal Mach Intell 40(4):834–848

5. Wang M, Deng W (2021) Deep face recognition: a survey. Neurocomputing 429:215–244

6. Chen J-C, Patel VM, Chellappa R (2016) Unconstrained face verification using deep cnn features. In: 2016 IEEE winter conference on applications of computer vision (WACV). IEEE.

7. Yang J et al. (2017) Neural aggregation network for video face recognition. In: Proceedings of the IEEE conference on computer vision and pattern recognition

8. Masi I et al. (2016) Do we really need to collect millions of faces for effective face recognition? In: Computer Vision–ECCV 2016: 14th European

Conference, Proceedings, Part V 14. Springer International Publishing, Amsterdam

9. Soni N, Kumar M, Mathur G (2013) Face recognition using SOM neural network with different facial feature extraction techniques. Int J Comput Appl 76:3

10. Arsenovic M et al (2017) FaceTime—Deep learning based face recognition attendance system. In: 2017 IEEE 15th International symposium on intelligent systems and informatics (SISY). IEEE

11. Fu R et al (2017) University classroom attendance based on deep learning. In: 2017 10th International Conference on Intelligent Computation Technology and Automation (ICICTA). IEEE

12. Zulfiqar M et al (2019) Deep face recognition for biometric authentication. In: 2019 international conference on electrical, communication, and computer engineering (ICECCE). IEEE

13. Wang Y-Q (2014) An analysis of the Viola-Jones face detection algorithm. Image Process Online 4:128–148

14. Dong Y (2022) 3D face recognition neural network for digital human resource management. Sci Programm 2022:1–9

15. Mukherjee P et al (2021) Monitoring, recognition and attendance automation in online class: combination of image processing, cryptography in IoT security. In: International Conference on Network Security and Blockchain Technology. Springer Nature, Singapore

16. Shatnawi M et al (2022) Deep learning approach for masked face identification. Int J Adv Comput Sci Appl 13:6

17. Lin S-H (2000) An introduction to face recognition technology. Inform Sci Int J Emerg Transdiscipl 3:1–7

18. Bhattacharya S, Nainala GS, Das P, Routray A (2018) Comparative study between traditional and modern attendance marking system. In: 2018 IEEE 18thInternational Conference on Advanced Learning Technologies

19. Zhao H, Liang X-J, Yang P (2013) This document presents a specific facial recognition technology based on an embedded platform and proposes a solution centered on the facial detection algorithm, China Correspondence

20. Alhanaee K et al (2021) Face recognition smart attendance system using deep transfer learning. Proc Comput Sci 192:4093–4102

21. Wang C (2018) What's the difference between Haar-feature classifiers and convolutional neural networks. Towards data science

22. Wang J, Tan T (2000) A new face detection method based on shape information. Pattern Recogn Lett 21(6–7):463–471

23. Seitkaziyev A (2020) Classifiers' evaluation metrics. dev.to

24. Gupta S, Dasgupta A, Routray A (2011) Analysis of training parameters for classifiers based on

Haar-like features to detect human faces. In: 2011 International Conference on Image Information Processing. IEEE

25. Chin H (2018) Face recognition based automated student attendance system. Dissertation, UTAR

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