

Machine Learning Techniques for Real - Time Emotion Detection from Facial Expression

Sakshi Borade¹, Anushka Kahandal², Sakshi Pekhale³, Gauri Barve⁴, Prof. Aishwarya Sanap⁵
Department of Information Technology^{1,2,3,4,5}

Matoshri Aasarabai Polytechnic Eklahare Nashik, Maharashtra, India

Abstract: Facial expressions recognition by emotion is a crucial component in many applications. This paper covers the recent trends in human emotion detection. An overview of various facial emotion recognition and its applications are presented. In the literature review, major machine-learning techniques used for facial emotion identification have been explored. Machine learning approaches are compared on the basis of their advantages, disadvantages, and their accuracy. Theoretical analysis of existing approaches shows that the algorithm providing the maximum accuracy should be used for facial emotion recognition. The existing approaches are also suffered from some challenges and those challenges should be addressed and considered for accurately predicting the users' emotional state. The application of emotion detection is also very vast and a few of the major applications are also discussed. Finally, a brief analysis of existing Machine learning approaches and their conclusion is given.

Keywords: facial expressions; facial emotion recognition(FER); machine learning

BIBLIOGRAPHY

- [1]. Xiao-Ling Xia, Cui Xu, Bing Nan (2017), "Facial Expression Recognition Based on TensorFlowPlatform," ITM Web of Conferences, ResearchGate
- [2]. G.Hintin ,Greves (2013), "Emotion Recognition with Deep Recurrent Neural Networks," IEEE International Conference on Acoustics, Speech and Signal Processing, pp.6645-6649.
- [3]. Karan Sethi (2020), "Emotion Detection Using OpenCV and keras," Start it up.
- [4]. NithyaRoopa.S (2019), "Emotion Recognition from Facial Expression using Deep Learning," International Journal of Engineering and Advanced Technology(IJEAT
- [5]. Abdat, F. et al. (2011). Human-Computer Interaction Using Emotion Recognition from Facial Expression. In: 2011 UKSim 5th European Symposium on Computer Modeling and Simulation. IEEE.doi: 10 . 1109/ems.2011.20
- [6]. Andalibi, Nazanin and Justin Buss (2020). The Human in Emotion Recognition on Social Media: Attitudes, Outcomes, Risks. In: Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems. CHI '20. Honolulu, HI, USA: Association for Computing Machinery, pp. 1–16.isbn: 9781450367080. doi: 10.1145/3313831.3376680
- [7]. Barrett, Lisa Feldman et al. (2019). Emotional Expressions Reconsidered: Challenges to Inferring Emotion From Human Facial Movements. In: Psychological Science in the Public Interest 20.1. PMID: 31313636, pp. 1–68. doi: 10 . 1177 / 1529100619832930
- [8]. Cowie, R. et al. (2001). Emotion recognition in humancomputer interaction. In: IEEE SignalProcessing Magazine 18.1, pp. 32–80. doi: 10.1109/79.911197.
- [9]. Crawford, K. et al. (2019). AI Now 2019 Report. Tech. rep. New York: AI Now Institute. Daily, Shaundra B. et al. (2017). Affective Computing: Historical Foundations, Current Applications, and Future Trends. In: Emotions and Affect in Human Factors and Human-Computer Interaction. Elsevier,pp. 213–231. doi: 10 . 1016 / b978 - 0 - 12 - 801851-4.00009-4
- [10]. Du, Shichuan et al. (2014). Compound facial expressions of emotion. In: Proceedings of theNational Academy of Sciences 111.15, E1454–E1462. issn: 0027-8424. doi: 10.1073/pnas.1322551111

- [11]. eprint: <https://www.pnas.org/content/111/15/E1454.full.pdf>. Ekman, Paul and Wallace V Friesen(2003). Unmasking the face: A guide to recognizing emotions from facial clues. Ishk. Jacintha, V et al.(2019). A Review on Facial Emotion Recognition Techniques. In: 2019 International Conference on Communication and Signal Processing (ICCSP). IEEE, pp. 0517–0521. doi: 10.1109/ICCSP.2019.8698067
- [12]. [Ko, ByoungChul (2018). A brief review of facial emotion recognition based on visual information. In: Sensors 18.2, p. 401. doi: 10.3390/s18020401.
- [13]. Lang, Peter J. et al. (1993). Looking at pictures: Affective, facial, visceral, and behavioral reactions. In: Psychophysiology 30.3, pp. 261–273. doi: 10.1111/j.1469-8986.1993.tb03352.x
- [14]. Rhue, Lauren (2018). Racial Influence on Automated Perceptions of Emotions. In: SSRN Electronic Journal. doi: 10.2139/ssrn.3281765.
- [15]. Russell, James A. (1995). Facial expressions of emotion: What lies beyond minimal universality? In: Psychological Bulletin 118.3, pp. 379–391. doi: 10.1037/0033-2909.118.3.379.
- [16]. Sedenberg, Elaine and John Chuang (2017). Smile for the Camera: Privacy and Policy Implications of Emotion AI. arXiv: 1709.00396 [cs.CY].