IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 5, May 2022
Impact Factor: 6.252

Face Mask Detection using Machine Learning

Varsha Shantaram Salve, Vaishnavi Mangesh Chavan, Pallavi Madhukar Gawade, Dipika Ravsaheb Kapare, Prof. Panzade. B. V.
HSBPVT's GOI College of Engineering, Kashti, Ahmednagar, Maharashtra, India

Abstract: *In this project, we present a susceptible–infected– recovered (SIR) model with individuals wearing facial masks and individuals who do not. The disease transmission rates, the recovering rates, and the fraction of individuals who wear masks are all time-dependent in the model.We develop a progressive estimation of the disease transmission rates and the recovering rates based on the coronavirus disease 2019 (COVID-19) dating a published by John Hopkins University. We determine the fraction of individual who wear masks by a maximum likelihood estimation, which maximizes the transition probability of a stochastic SIR model. The transition probability is numerically difficult to compute whether the number of infected individuals is large. We develop an approximation for the transition probability based on the central limit theorem and mean-field approximation. We show through numerical study that our approximation works well. We develop a bond percolation analysis to predict the eventual fraction of population who are infected, assuming that parameters of the SIR model do not change anymore. The percolation threshold is exactly the basic reproduction number of the epidemic. We predict the outcome of COVID-19 pandemic using our theory.*

Keywords: Bond percolation, coronavirus disease 2019 (COVID-19), epidemic network, masks, susceptible–infected–recovered (SIR) model.

REFERENCES

[1]. X. Ma, H. Yang, Q. Chen, D. Huang, and Y. Wang, "Depaudionet: An efficient deep model for audio based depression classification," in Proceedings of the 6th International Workshop on Audio/Visual Emotion Challenge, ser. AVEC '16. ACM, 2016, pp. 35–42.

[2]. S. Alghowinem, R. Goecke, M. Wagner, J. Epps, M. Hyett, G. Parker, and M. Breakspear, "Multimodal depression detection:fusion analysis of paralinguistic, head pose and eye gaze behaviors," IEEE Transactions on Affective Computing, vol. PP, no. 99, pp. 1–1, 2016.

[3]. Y. Zhu, Y. Shang, Z. Shao, and G. Guo, "Automated depression diagnosis based on deep networks to encode facial appearance and dynamics," IEEE Transactions on Affective Computing, vol. PP, no. 99, pp. 1–1, 2017.

[4]. J. Lu, V. E. Liong, X. Zhou, and J. Zhou, "Learning compact binary face descriptor for face recognition," IEEE transactions on pattern analysis and machine intelligence, vol. 37, no. 10, pp. 2041–2056, 2015.

[5]. A.Jan, H. Meng, Y. F. A. Gaus, and F. Zhang, "Artificial intelligent system for automatic depression level analysis through visual and vocal expressions," IEEE Transactions on Cognitive and Developmental Systems, vol. PP, no. 99, pp. 1–1, 2017.

[6]. K. He, X. Zhang, S. Ren, and J. Sun, "Deep residual learning for image recognition," in Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, 2016, pp. 770–778.

[7]. B. Zhou, A. Khosla, A. Lapedriza, A. Oliva, and A. Torralba, "Learning deep features for discriminative localization," in Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, 2016, pp. 2921–2929.

[8]. L. Tran, X. Yin, and X. Liu, "Disentangled representation learning gan for pose-invariant face recognition," in In Proceeding of IEEE Computer Vision and Pattern Recognition, Honolulu, HI, July 2017.

[9]. S. Li, W. Deng, and J. Du, "Reliable crowdsourcing and deep locality preserving learning for expression recognition in the wild," in The IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Jul 2017.

[10]. M. Abadi, P. Barham, J. Chen, Z. Chen, A. Davis, J. Dean, M. Devin, S. Ghemawat, G. Irving, M. Isard et al., "Tensorflow: A system for largescale machine learning," in Proceedings of the 12th USENIX Symposium on Operating Systems Design and Implementation (OSDI). Savannah, Georgia, USA, 2016.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 5, May 2022
Impact Factor: 6.252