

Artificial Intelligence Based Detection And Classification of Diseases using Chest X-Ray Images

Puneeth GJ¹, Anusha H², K Srushti³, Eedupuganti Neelima⁴, Manasa K⁵

Assistant Professor, Department of Computer Science and Engineering¹

Students, Department of Computer Science and Engineering^{2,3,4,5}

Rao Bahadur Y Mahabaleswarappa Engineering College, Ballari, Karnataka, India

Abstract: *The pandemic of coronavirus disease 2019 (COVID-19) has resulted in an increased demand for testing, diagnosis, and treatment. Reverse transcription polymerase chain reaction (RT-PCR) is that the definitive test for the diagnosis of COVID-19, however, chest X-ray radiography (CXR) may be a fast, effective, and affordable test that identifies the possible COVID-19-related pneumonia and tuberculosis. This study investigates the feasibility of employing a deep learning-based decision-tree classifier for detecting COVID-19, PNEUMONIA and TUBERCULOSIS from CXR images.*

Keywords: COVID-19

REFERENCES

- [1]. Arun Sharma, Sheebha Rani, Dinesh Gupta “Artificial Intelligence-Based Classification of Chest X-Ray Images into COVID-19 and Other Infectious Diseases” .Translational Published on 23 June 2021..Bioinformatics Group, International Centre for Genetic Engineering and Biotechnology (ICGEB), Aruna Asaf Ali Marg, New Delhi 110067, India. Published online 2020 Oct 6.
- [2]. Hussein Kaheel, Ali Hussein and Ali Chehab “AI-Based Image Processing for COVID-19 Detection in Chest CT Scan Images”. Department of Electrical and Computer Engineering, American University of Beirut (AUB), Beirut, Lebanon. Published on 09 August 2021.
- [3]. Peter M George, Shaney L Barratt, Robin Condliffe “ Respiratory follow-up of patients with COVID-19 pneumonia” Correspondence to Dr Peter M George, Interstitial Lung Disease Unit, Royal Brompton and Harefield NHS Foundation Trust, London, UK. Published on 2020.
- [4]. Daniel Arias, Garzon, Harold, Barayan Arteaga, Oscar Cardona Morales “COVID-19 detection in Xray images using convolutional neural networks” Department of Electronics and Industrial Automation, Universidad Autonoma de Manizales, Manizales 170001, Colombia Department of Computer Science, Universidad Autonoma de Manizales, Manizales 170001, Colombia. Published on 15 December 2021.
- [5]. Dong Yang, Anna Maria Ierardi, Cristiano Gierlando “Artificial intelligence for the detection of COVID-19 pneumonia on chest CT using multinational datasets” Nat Commun 11. Published on 14 August 2020.
- [6]. U Rajendra Acharya, Tulin Ozturk, Mohammad Talo “Automated detection of COVID-19 cases using deep neural networks with X-ray images” Department of Radiology, Medical Park Hospital, Elazığ, Turkey and Department of Software Engineering, Firat University, Elazığ, Turkey. Published on 28 April 2020.
- [7]. Lei Rigi Baltazar, Mario Domingo, Jason Albia “Artificial intelligence on COVID-19 pneumonia detection using chest xray images” open access article distributed under the terms of the Creative Commons Attribution License. Published on 14 October 2021.
- [8]. Rachana Jain, Meenu Gupta, Soham Taneja “Deep learning based detection and analysis of COVID-19 on chest X-ray images” Department of CSE, Bharati Vidyapeeth’s College of Engineering, Delhi, India Rachna Jain & Soham Taneja Department of CSE, Chandigarh University, Punjab, India Meenu Gupta Department of ECE, Karunya Institute of Technology and Sciences, Coimbatore, India. Published on 9 October 2020.
- [9]. Dejun Zhang, Fuquan Ren, Yuema “Pneumonia Detection from Chest X-ray Images Based on Convolutional Neural Network” School of Science, Yanshan University, Qinhuangdao 066004, China; ZhangDejun1997@163.com(D.Z.); yushuangli@ysu.edu.cn (Y.L.) and mayue13203525596@163.com (Y.M.) Affiliated Hospital of Chengde Medical College, Chengde 067000, China; nalei625@163.com.

- [10]. Zhi Zhen Qin, Kishor Paul, Shahriar Ahmed “Tuberculosis detection from chest x-rays for triaging in a high tuberculosis” The Lancet-Digital Health Published on September 2021 .
- [11]. sAltan and S. Karasu, “Recognition of COVID-19 disease from X-ray images by hybrid model consisting of 2D curvelet transform, chaotic salp swarm algorithm and deep learning technique,” Chaos, Solitons & Fractals, vol. 140, p. 110071, 2020.
- [12]. Waheed, M. Goyal, D. Gupta, A. Khanna, F. al-Turjman, and P. R. Pinheiro, “CovidGAN: data augmentation using auxiliary classifier GAN for improved Covid-19 detection” IEEE Access, vol. 8, pp. 91916–91923, 2020.
- [13]. V. Krishnan, Lack of testing kits, understaffed hospitals:exposes India’s crumbling healthcare system,2020,<https://caravanmagazine.in/health/lack-testing-kits-understaffed-hospitals-covid-exposesindiacrumbing-healthcare-system>.
- [14]. M. O. Wielpütz, C. P. Heußel, F. J. F. Herth, and H.-U. Kauczor, “Radiological diagnosis in lung disease: factoring treatment options into the choice of diagnostic modality” Deutsches Ärzteblatt International, vol. 111, pp. 181–187,2014.
- [15]. H. Swapnarekha, H. S. Behera, J. Nayak, and B. Naik, “Role of intelligent computing in COVID-19 prognosis: a state-of-the-art review,” Chaos, Solitons & Fractals, vol. 138, p. 109947,2020.
- [16]. C. Shorten and T. M. Khoshgoftaar, “A survey on image data augmentation for deep learning,” Journal of Big Data, vol. 6,no. 1, p. 60, 2019.
- [17]. Z. Hussain, F. Gimenez, D. Yi, and D. Rubin, “Differential data augmentation techniques for medical imaging classification tasks,” AMIA Annual Symposium Proceedings, vol. 2017,pp. 979–984, 2018.
- [18]. Z. Tang, K. Chen, M. Pan, M. Wang, and Z. Song, “An augmentation strategy for medical image processing based on statistical shape model and 3D thin plate spline for deep learning,” IEEE Access, vol. 7, pp. 133111–133121, 2019.