

CORRECTION

Open Access



# Correction: VER-Net: a hybrid transfer learning model for lung cancer detection using CT scan images

Anindita Saha<sup>1</sup> , Shahid Mohammad Ganie<sup>2</sup> , Pijush Kanti Dutta Pramanik<sup>3\*</sup> , Rakesh Kumar Yadav<sup>4</sup> , Saurav Mallik<sup>5</sup> and Zhongming Zhao<sup>6\*</sup>

**Correction to:** Saha et al. *BMC Medical Imaging* (2024) 24:120.

<https://doi.org/10.1186/s12880-024-01238-z>.

Due to a typesetting error, the last page of the PDF version of the Original Article was cut. Thus, reference number 12–45 were not shown.

Reference 12–45 are as follows:

The original article has been corrected.

Published online: 31 May 2024

The online version of the original article can be found at <https://doi.org/10.1186/s12880-024-01238-z>.

\*Correspondence:

Pijush Kanti Dutta Pramanik

pijushjld@yahoo.co.in

Zhongming Zhao

zhongming.zhao@uth.tmc.edu

<sup>1</sup>Department of Computing Science and Engineering, IFTM University, Moradabad, Uttar Pradesh, India

<sup>2</sup>AI Research Centre, Department of Analytics, School of Business, Woxsen University, Hyderabad, Telangana 502345, India

<sup>3</sup>School of Computer Applications and Technology, Galgotias University, Greater Noida, Uttar Pradesh 203201, India

<sup>4</sup>Department of Computer Science & Engineering, MSOET, Maharishi University of Information Technology, Lucknow, Uttar Pradesh, India

<sup>5</sup>Department of Environmental Health, Harvard T. H. Chan School of Public Health, Boston, MA, USA

<sup>6</sup>Center for Precision Health, McWilliams School of Biomedical Informatics, The University of Texas Health Science Center at Houston, Houston, TX 77030, USA

## References

12. Tsuneki M. Deep learning models in medical image analysis. *J Oral Biosci.* 2022;64(3):312–20. <https://doi.org/10.1016/j.job.2022.03.003>.
13. Dara S, Tumma P, Eluri NR, Rao Kancharla G. Feature Extraction In Medical Images by Using Deep Learning Approach. [Online]. Available: <http://www.acadpubl.eu/hub/>.
14. Kuwil FH. A new feature extraction approach of medical image based on data distribution skew. *Neurosci Inf.* 2022;2(3):100097. <https://doi.org/10.1016/j.neuri.2022.100097>.
15. Bar Y, Diamant I, Wolf L, Lieberman S, Konen E, Greenspan H. Chest pathology identification using deep feature selection with non-medical training. *Comput Methods Biomech Biomed Eng Imaging Vis.* May 2018;6(3):259–63. <https://doi.org/10.1080/21681163.2016.1138324>.
16. Pandiyarajan M, Thimmiraja J, Ramasamy J, Tiwari M, Shinde S, Chakravarthi MK. Medical Image Classification for Disease Prediction with the Aid of Deep Learning Approaches, in *2022 2nd International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE)*, 2022, pp. 724–727. <https://doi.org/10.1109/ICACITE53722.2022.9823417>.
17. Hemachandran K et al. Feb., Performance Analysis of Deep Learning Algorithms in Diagnosis of Malaria Disease, *Diagnostics*, vol. 13, no. 3, 2023, <https://doi.org/10.3390/diagnostics13030534>.
18. Kumar Mallick P, Ryu SH, Satapathy SK, Mishra S, Nguyen GN, Tiwari P. Brain MRI image classification for Cancer Detection using deep Wavelet Autoencoder-based deep neural network. *IEEE Access.* 2019;7:46278–87. <https://doi.org/10.1109/ACCESS.2019.2902252>.
19. Yu X, Wang J, Hong Q-Q, Teku R, Wang S-H, Zhang Y-D. Transfer learning for medical images analyses: a survey. *Neurocomputing.* 2022;489:230–54. <https://doi.org/10.1016/j.neucom.2021.08.159>.
20. Li X, et al. Transfer learning in computer vision tasks: remember where you come from. *Image Vis Comput.* 2020;93:103853. <https://doi.org/10.1016/j.imavis.2019.103853>.
21. Alyafeai Z, AlShaibani MS, Ahmad I. A Survey on Transfer Learning in Natural Language Processing, May 2020, [Online]. Available: <http://arxiv.org/abs/2007.04239>.
22. Wang D, Zheng TF. Transfer learning for speech and language processing, in *2015 Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA)*, 2015, pp. 1225–1237. <https://doi.org/10.1109/APSIPA.2015.7415532>.
23. Kim HE, Cosa-Linan A, Santhanam N, Jannesari M, Maros ME, Ganslandt T. Transfer learning for medical image classification: a literature review. *BMC Med Imaging.* 2022;22(1):69. <https://doi.org/10.1186/s12880-022-00793-7>.



© The Author(s) 2024. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

24. Sarker IH. Deep Learning: A Comprehensive Overview on Techniques, Taxonomy, Applications and Research Directions, *SN Computer Science*, vol. 2, no. 6. Springer, Nov. 01, 2021. <https://doi.org/10.1007/s42979-021-00815-1>.
25. Egger J, et al. Medical deep learning—A systematic meta-review. *Comput Methods Programs Biomed.* 2022;221:106874. <https://doi.org/10.1016/j.cmpb.2022.106874>.
26. Huang J, Chai J, Cho S. Deep learning in finance and banking: A literature review and classification, *Frontiers of Business Research in China*, vol. 14, no. 1. Springer, Dec. 01, 2020. <https://doi.org/10.1186/s11782-020-00082-6>.
27. Haleem A, Javaid M, Asim Qadri M, Pratap R, Singh, Suman R. Artificial intelligence (AI) applications for marketing: a literature-based study. *Int J Intell Networks.* 2022;3:119–32. <https://doi.org/10.1016/j.ijin.2022.08.005>.
28. Wang S, Dong L, Wang X, Wang X. Classification of pathological types of lung cancer from CT images by deep residual neural networks with transfer learning strategy, *Open Medicine (Poland)*, vol. 15, no. 1, pp. 190–197, Jan. 2020, <https://doi.org/10.1515/med-2020-0028>.
29. Han Y, et al. Histologic subtype classification of non-small cell lung cancer using PET/CT images. *Eur J Nucl Med Mol Imaging.* 2021;48(2):350–60. <https://doi.org/10.1007/s00259-020-04771-5>.
30. Vijayan N, Kuruvilla J. The impact of transfer learning on lung cancer detection using various deep neural network architectures, in 2022 IEEE 19th India Council International Conference (INDICON), 2022, pp. 1–5. <https://doi.org/10.1109/INDICON56171.2022.10040188>.
31. da Nóbrega RVM, Peixoto SA, da Silva SPP, Filho PPR. Lung Nodule Classification via Deep Transfer Learning in CT Lung Images, in 2018 IEEE 31st International Symposium on Computer-Based Medical Systems (CBMS), 2018, pp. 244–249. <https://doi.org/10.1109/CBMS.2018.00050>.
32. Dadgar S, Neshat M. Comparative Hybrid Deep Convolutional Learning Framework with Transfer Learning for Diagnosis of Lung Cancer, in Proceedings of the 14th International Conference on Soft Computing and Pattern Recognition (SoCPaR 2022), A. Abraham, T. Hanne, N. Gandhi, P. Manghirmalani Mishra, A. Bajaj, and P. Siarry, Eds., Cham: Springer Nature Switzerland, 2023, pp. 296–305.
33. Sori WJ, Feng J, Godana AW, Liu S, Gelmecha DJ. DFD-Net: lung cancer detection from denoised CT scan image using deep learning. *Front Comput Sci.* 2020;15(2):152701. <https://doi.org/10.1007/s11704-020-9050-z>.
34. Sari S, Soesanti I, Setiawan NA. Best Performance Comparative Analysis of Architecture Deep Learning on CT Images for Lung Nodules Classification, in 2021 IEEE 5th International Conference on Information Technology, Information Systems and Electrical Engineering (ICITISEE), 2021, pp. 138–143. <https://doi.org/10.1109/ICITISEE53823.2021.9655872>.
35. Gonzalez Zelaya CV. Towards Explaining the Effects of Data Preprocessing on Machine Learning, in 2019 IEEE 35th International Conference on Data Engineering (ICDE), 2019, pp. 2086–2090. <https://doi.org/10.1109/ICDE.2019.00245>.
36. Hassler AP, Menasalvas E, García-García FJ, Rodríguez-Mañas L, Holzinger A. Importance of medical data preprocessing in predictive modeling and risk factor discovery for the frailty syndrome. *BMC Med Inf Decis Mak.* 2019;19(1):33. <https://doi.org/10.1186/s12911-019-0747-6>.
37. Komorowski M, Marshall DC, Saliccioli JD, Crutain Y. Exploratory Data Analysis. In: Data MITC, editor. *Secondary Analysis of Electronic Health Records*. Cham: Springer International Publishing; 2016. pp. 185–203. [https://doi.org/10.1007/978-3-319-43742-2\\_15](https://doi.org/10.1007/978-3-319-43742-2_15).
38. Meem RF, Hasan KT. Osteosarcoma Tumor Detection using Transfer Learning Models, May 2023, [Online]. Available: <http://arxiv.org/abs/2305.09660>.
39. Kusniadi I, Setyanto A. Fake Video Detection using Modified XceptionNet, in 2021 4th International Conference on Information and Communications Technology (ICOACT), 2021, pp. 104–107. <https://doi.org/10.1109/ICOACT53268.2021.9563923>.
40. Wang S-H, Zhang Y-D. DenseNet-201-Based Deep Neural Network with Composite Learning Factor and Precomputation for Multiple Sclerosis Classification, *ACM Trans. Multimedia Comput. Commun. Appl.*, vol. 16, no. 2s, Jun. 2020. <https://doi.org/10.1145/3341095>.
41. Zhang Q. A novel ResNet101 model based on dense dilated convolution for image classification. *SN Appl Sci.* Jan. 2022;4(1). <https://doi.org/10.1007/s42452-021-04897-7>.
42. Abdulhussein WR, El NK, Abbadi, Gaber AM. Hybrid Deep Neural Network for Facial Expressions Recognition, *Indonesian Journal of Electrical Engineering and Informatics*, vol. 9, no. 4, pp. 993–1007, Dec. 2021, <https://doi.org/10.52549/ijeel.v9i4.3425>.
43. Kurt Z, Işık Ş, Kaya Z, Anagün Y, Koca N, Çiçek S. Evaluation of EfficientNet models for COVID-19 detection using lung parenchyma. *Neural Comput Appl.* 2023;35(16):12121–32. <https://doi.org/10.1007/s00521-023-08344-z>.
44. Mateen M, Wen J, Nasrullah S, Song, Huang Z. Fundus image classification using VGG-19 architecture with PCA and SVD. *Symmetry (Basel)*, vol. 11, no. 1, Jan. 2019, <https://doi.org/10.3390/sym11010001>.
45. Chon A, Balachandar N, Lu P. Deep Convolutional Neural Networks for Lung Cancer Detection.

## Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.