

Hybrid Method for Brain Tumor Detection Using Optimized Edge Detection Approach

Dr. Sunil L. Bangare¹, Pavan Patil², Pradnya Gambhire³, Sheetal Chavan⁴, Shubhangi Tekwade⁵

Associate Professor, Department of Information Technology¹

UG Scholar, Department of Information Technology^{2,3,4,5}

Sinhgad Academy of Engineering, Pune, Maharashtra, India

Savitribai Phule Pune University, Pune, Maharashtra, India

sunil.bangare@gmail.com¹

Abstract: Image Processing accepts a critical part in various spaces like clinical imaging, surveillance and surgical, etc. The main aim of proposed structure is to develop a system for tumor cancers recognition i.e., to recognize whether the individual has a hurtful or non-risky growth of tumor using CNN and SVM methods. Support Vector Machine is been used in proposed structure that works on fundamental risk minimization to classify the Images. The structure using python is made using CNN and SVM for the cancer extraction and classifications. This proposed system presents a model for CNN and SVM-based Image Processing, which classify the Images and system can surveys whether the gathered Image of patient is harmful or non-harmful tumor and as well as detecting the edge.

Keywords: Image processing, Support Vector Machine (SVM) MRI images, Convolutional Neural Network (CNN)

REFERENCES

- [1]. D. Suresha and N. Jagadisha , “ Detection of Brain Tumor using Image Processing”, Fourth International Conference on Computing Methodologies and communication, 2020
- [2]. Ashfaq Hussain and Ajay Khunteta,” Semantic segmentation of brain tumor from MRI images and SVM Classification using GLCM features”, Second International Conference on Inventive Research in Computing Application, 2020
- [3]. S. Suhas and C. R. Venugopal, “MRI image preprocessing and noise removal technique using linear and nonlinear filters”, 2017 International Conference on Electrical , Electronics , Communication ,Computer and Optimization Techniques
- [4]. N. Varuna Shree and T. N. R Kumar, “Identification and classification of brain tumor MRI images with feature extraction using DWT and Probabilistic neural network”, Springer , 2018
- [5]. F. P. Polly and S.K . Shil, “Detection and classification of HGG and LGG brain tumor using machine learning”, International Conference on Information Networking, 2018.
- [6]. S. L. Bangare, “Classification of optimal brain tissue using dynamic region growing and fuzzy min-max neural network in brain magnetic resonance images”, Neuroscience Informatics, Volume 2, Issue 3, September 2022, 100019, ISSN 2772-5286, <https://doi.org/10.1016/j.neuri.2021.100019> .
- [7]. S. L. Bangare, G. Pradeepini, S. T. Patil, “Implementation for brain tumor detection and three dimensional visualization model development for reconstruction”, ARPN Journal of Engineering and Applied Sciences (ARPN JEAS), Vol.13, Issue.2, ISSN 1819-6608, pp.467-473. 20/1/2018 http://www.arpnjournals.org/jeas/research_papers/rp_2018/jeas_0118_6691.pdf
- [8]. S. L. Bangare, S. T. Patil et al, “Reviewing Otsu’s Method for Image Thresholding.” International Journal of Applied Engineering Research, ISSN 0973-4562, Volume 10, Number 9 (2015) pp. 21777-21783, © Research India Publications <https://dx.doi.org/10.37622/IJAER/10.9.2015.21777-21783>
- [9]. S. L. Bangare, G. Pradeepini, S. T. Patil, “Regenerative pixel mode and tumor locus algorithm development for brain tumor analysis: a new computational technique for precise medical imaging”, International Journal of

- Biomedical Engineering and Technology, Inderscience, 2018, Vol.27 No.1/2. <https://www.inderscienceonline.com/doi/pdf/10.1504/IJBET.2018.093087>
- [10]. S. L. Bangare, G. Pradeepini, S. T. Patil et al, "Neuroendoscopy Adapter Module Development for Better Brain Tumor Image Visualization", International Journal of Electrical and Computer Engineering (IJECE) Vol. 7, No. 6, December 2017, pp. 3643~3654. <http://ijece.iaescore.com/index.php/IJECE/article/view/8733/7392>
- [11]. N. Shelke, S. Chaudhury, S. Chakrabarti, S. L. Bangare et al. "An efficient way of text-based emotion analysis from social media using LRA-DNN", Neuroscience Informatics, Volume 2, Issue 3, September 2022, 100048, ISSN 2772-5286, <https://doi.org/10.1016/j.neuri.2022.100048>.
- [12]. Suneet Gupta, Sumit Kumar, Sunil L. Bangare, Shibili Nuhmani, Arnold C. Alguno, Issah Abubakari Samori, "Homogeneous Decision Community Extraction Based on End-User Mental Behavior on Social Media", Computational Intelligence and Neuroscience, vol. 2022, Article ID 3490860, 9 pages, 2022. <https://doi.org/10.1155/2022/3490860>.
- [13]. Gururaj Awate, S. L. Bangare, G. Pradeepini and S. T. Patil, "Detection of Alzheimers Disease from MRI using Convolutional Neural Network with Tensorflow", arXiv, <https://doi.org/10.48550/arXiv.1806.10170>
- [14]. S. L. Bangare, G. Pradeepini and S. T. Patil, "Brain tumor classification using mixed method approach," 2017 International Conference on Information Communication and Embedded Systems (ICICES), 2017, pp. 1-4, doi: 10.1109/ICICES.2017.8070748.
- [15]. S. L. Bangare, S. Prakash, K. Gulati, B. Veeru, G. Dhiman and S. Jaiswal, "The Architecture, Classification, and Unsolved Research Issues of Big Data extraction as well as decomposing the Internet of Vehicles (IoV)," 2021 6th International Conference on Signal Processing, Computing and Control (ISPCC), 2021, pp. 566-571, doi: 10.1109/ISPCC53510.2021.9609451.
- [16]. P. S. Bangare, S. L. Bangare, R. U. Yawle and S. T. Patil, "Detection of human feature in abandoned object with modern security alert system using Android Application," 2017 International Conference on Emerging Trends & Innovation in ICT (ICEI), 2017, pp. 139-144, doi: 10.1109/ETIICT.2017.7977025
- [17]. S. L. Bangare, A. R. Khare, P. S. Bangare, "Quality measurement of modularized object oriented software using metrics", ICWET '11: Proceedings of the International Conference & Workshop on Emerging Trends in Technology, February 2011, pp. 771-774. <https://doi.org/10.1145/1980022.1980190.1>.
- [18]. Kalpana S. Thakare, Viraj Varale, "Prediction of Heart Disease using Machine Learning Algorithm", Bioscience Biotechnology Research Communications (Special issue) Volume 13, Issue 12, 2020 (Dec 2020 issue).
- [19]. Kalpana S. Thakare, A. M. Rajurkar, "Shot Boundary Detection of MPEG Video using Biorthogonal Wavelet Transform", International Journal of Pure and Applied Mathematics, Volume 118, No. 7, pp. 405-413, ISSN: 1311-8080 (printed version); ISSN: 1314-3395 (on-line version), url: <http://www.ijpam.eu>
- [20]. Kalpana S. Thakare, A. M. Rajurkar, R. R. Manthalkar, "Video Partitioning and Secured Key frame Extraction of MPEG Video", Proceedia Computer Science Journal, Volume 78, pp 790-798, Elsevier, 2016. Scopus DOI: <http://10.1016/j.procs.2016.02.058>, www.sciencedirect.com/science/article/pii/S1877050916000600
- [21]. Kalpana S. Thakare, A. M. Rajurkar and R. R. Manthalkar, "Content based Video Retrieval using Latent Semantic Indexing and Color, Motion and Edge Features", International Journal of Computer Applications 54(12):42-48, September 2012, Published by Foundation of Computer Science, New York, USA. DOI: 10.5120/8621-2486
- [22]. Kalpana S. Thakare, Archana M. Rajurkar, R. R. Manthalkar, "A Comprehensive System Based on Spatiotemporal Features Such as motion, Quantized Color and Edge Features", International Journal of Wireless and Microwave Technologies (IJWMT) ISSN 1449 (Print), ISSN: 2076-9539 (Online), Vol.1, No.3, June. 2011, DOI: 10.5815/ijwmt
- [23]. Kalpana S. Thakare, Archana M. Rajurkar, Dr. R. R. Manthalkar, "An effective CBVR system based on Motion, Quantized color and edge density features", International Journal of Computer Science & Information Technology (IJCSIT), ISSN 0975 – 3826, Vol 3, No 2, April 2011 DOI: 10.5121/ijcsit.2011.3206 78.