Automated brain tumor detection using machine learning: A bibliometric review

Rajan Hossain [1] , Roliana Binti Ibrahim [2] , Haslina Binti Hashim [3]

Abstract

To develop a research overview of brain tumour classification using machine learning, systematic review with bibliometric analysis was conducted, which is reported here. This study provides a systematic review based on bibliometric analysis of 1747 publications on automated brain tumor detection using machine learning, published in past 5 years (2019 - 2023) in 679 different sources, authored by 6632 scholars. Bibliographic data was collected from Scopus database and comprehensive bibliometric analysis was conducted using Biblioshiny based on R Platform. The most productive and collaborative institutes, papers, journals and countries were revealed based on citation analysis. Besides, various collaboration metrics were presented on the institute, country and author level. Lotka's law was tested based on the authors performance. Analysis showed that authors publication trends followed Lotka's inverse square law. Annual publication analysis showed that 36.46 percent papers were published in 2022, with an steady growth from previous years. Most cited authors focused on multi class classification along with novel Convolutional Neural Network (CNN) models that are efficient for small training sets. Keywords analysis showed that deep learning, MRI, Nuclear MRI, glioma appeared most times, proving that among several brain tumour types, most studies focused on Glioma. India, China and USA were among the highest collaborative countries both in terms of authors and institutes. University of Toronto, Harvard Medical School had the highest number of affiliations with 132 and 87 publications respectively.

Keywords: Brain Tumor Segmentation; Computer Aided Diagnostics; Deep Learning; MRI; Machine Learning.