A Survey on Brain Tumor Detection using Deep Learning Techniques

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Abstract

Brain tumor is an abnormal growth of cells within the brain that can interfere with critical functions such as cognition, movement and sensation. It can be either cancerous or non-cancerous depending on its cellular characteristics. Brain tumors can adversely affect the brain decision-making processes, operational efficiency and overall control capabilities. Brain tumor detection (BTD) is critical for early diagnosis and effective treatment. To prevent the deaths of millions of people due to brain tumor, we must come up with a solution that allows us to diagnose the condition early. This study presents survey on the research works done on development of deep learning (DL) technologies for the BTD from 2019-2024. The current trends and difficulties in the BTD using DL and modern imaging techniques are evaluated. Additionally, we examined different DL networks and evaluated each technique's effectiveness. The results of this comparison suggest the hybrid neural network is more effective in detection of brain tumor. MobileNetv3, CNN, ResNet-50 and hybrid models have overall detection accuracy between 92% to 99.75%. The MobileNetv3 model achieves success rate of 99.75% than other DL frameworks for detection of brain tumor. This demonstrates that DL algorithms can accurately detect brain tumor on its early stage.

Keywords

Brain tumor, Machine learning, Deep learning, MobileNetv3.