

Classifying Brain Tumors with Machine Learning: A Step Toward Life-Saving Diagnostics

When dealing with brain cancer, a correct diagnosis could mean the difference between life or death. However, mistakes often do happen. As the medical care system is overwhelmed and understaffed, doctors and nurses often miss early signs of malignant (cancerous) brain tumors, not providing patients with diagnoses until it is too late. However, convolutional neural networks (CNNs) can be used to mitigate the amount of missed or incorrect diagnoses, providing doctors with a useful and accurate tool so they can spend more time helping patients and saving lives.

In the following project, you will be tasked with building CNNs that can identify and classify cancerous brain tumors. You may also build other types of classifier models, such as random forests, if you choose. The data you will be using consists of 3,064 image files of patients' MRI scans from a research hospital in China. The files will represent three types of brain tumors: meningioma, glioma, and pituitary. While meningioma and pituitary tumors tend to be slower-growing, less invasive, and thus easier to diagnose, glioma tumors are the opposite. For these reasons, glioma tumors often are misdiagnosed or not caught at all, leading to deadly consequences. Your goal is to build a model that achieves at least 85% recall when classifying glioma brain tumors. Achieving 85% recall means that the model will detect true positive cases of glioma tumors 85% of the time.

For details about obtaining and pre-processing the project data, please refer to this [Github repository](#).