

## ***ABSTRACT***

*Brain tumors are a leading cause of fatal brain dysfunction if untreated. This research develops a CNN model with residual blocks for brain tumor detection in MRI images. The residual blocks effectively mitigated deep network degradation via shortcut connections, using an experimental methodology with axial T2-weighted MRI datasets. Work stages included data collection, pre-processing, model development, and evaluation via accuracy, precision, recall, and IoU. Validation results achieved 95.80% classification accuracy and 97% precision, but object detection yielded a 0.33 average Intersection over Union (IoU). Findings demonstrate model resilience to vanishing gradients while revealing localization challenges for tumors resembling cerebrospinal fluid. This approach provides a foundation for responsive deep learning-based medical diagnostics, though further spatial detection optimization is warranted.*

**Keywords:** *Brain Tumor, MRI, Convolutional Neural Network, Residual block, IoU, Deep Learning.*