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## Deep Learning-Based Automated Localization of Brain Tumors in CT Imaging

### Communication Info

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- (1) Brain Tumor Localization
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### Abstract

Accurate brain tumor localization is crucial for neuro-oncological diagnosis. While MRI is preferred for soft tissue, CT remains essential in emergencies and for patients with MRI contraindications [5]. Manual CT interpretation is time-consuming and variable, motivating automated solutions. This study proposes a deep learning framework for brain tumor localization on CT images, designed for AI-assisted clinical workflows. The model was trained on 11,500 annotated CT images from Roboflow. Addressing challenges of data scarcity and anatomical complexity [3], we employed the YOLOv9e architecture, known for strong medical detection performance [1,4]. Our system achieved a mean Average Precision (mAP) of 91.93% and a peak precision of 85.88%. Compared to YOLOv7-based approaches on MRI (87.9% mAP) [2], our results demonstrate competitive and robust performance. These findings highlight the potential of YOLOv9e to enhance diagnostic accuracy

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