



# Analyzing Clinical Neuroimaging Data using Artificial Intelligence

TECHNOLOGY NUMBER: 2025-635



## OVERVIEW

Prima is the first AI foundation model designed specifically for neuroimaging, using advanced vision and language understanding to interpret real-world clinical MRI studies.

- Trained on over 220,000 MRI studies, Prima provides rapid, accurate, and explainable diagnostic support that surpasses existing AI models.
- By automating parts of the radiology workflow, Prima offers transformative potential for hospitals—especially benefitting underserved, rural, and resource-limited healthcare settings facing critical bottlenecks.

## BACKGROUND

Neuroimaging, and MRI scanning in particular, is central to diagnosing a wide array of neurological conditions worldwide. As global demand for MRI grows rapidly—doubling approximately every six years—healthcare systems face mounting pressure with longer turnaround times, radiologist shortages, and risk of diagnostic errors. This strain is most acute in rural and low-resource areas, where specialist expertise and timely access to diagnostic imaging are scarce. Market analysis shows that healthcare providers are urgently seeking scalable solutions to increase diagnostic throughput, reduce physician burnout, and improve patient outcomes. Conventional AI approaches in neuroimaging have generally been limited to analyzing narrow, manually selected MRI data subsets, making them less effective and hard to

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## Category

Software

Software & Content

MOSS - Michigan Open Source  
Support

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generalize. The market need for more powerful, generalizable, and fair AI diagnostic tools in neuroimaging is both acute and rapidly expanding as medical imaging volumes continue to rise.

## INNOVATION

Prima is an advanced AI system that combines powerful image analysis with natural language processing to interpret full, real-world MRI studies as input—closely mirroring the way expert radiologists work. Instead of relying on hand-picked MRI slices, Prima “reads” entire scans using a hierarchical structure that discerns important features across all imaging sequences. It then aligns this analysis to diagnostic language—drawing on extensive training from hundreds of thousands of real clinical cases and their expert-written reports. Prima’s novel architecture enables it to deliver robust, accurate predictions and differential diagnoses across diverse patient groups, hospitals, and MRI machines. Unlike previous tools, it can justify its decisions by highlighting critical findings in the image and explaining its reasoning, greatly improving physician trust and workflow efficiency. Moreover, Prima is engineered for fairness: it maintains diagnostic accuracy across patient demographics and locations, reducing systemic healthcare disparities (such as rural patients’ longer wait times for imaging reports). Its plug-and-play flexibility means it can slot into existing hospital IT systems with little data preprocessing, and improve further simply by training on more health system data.