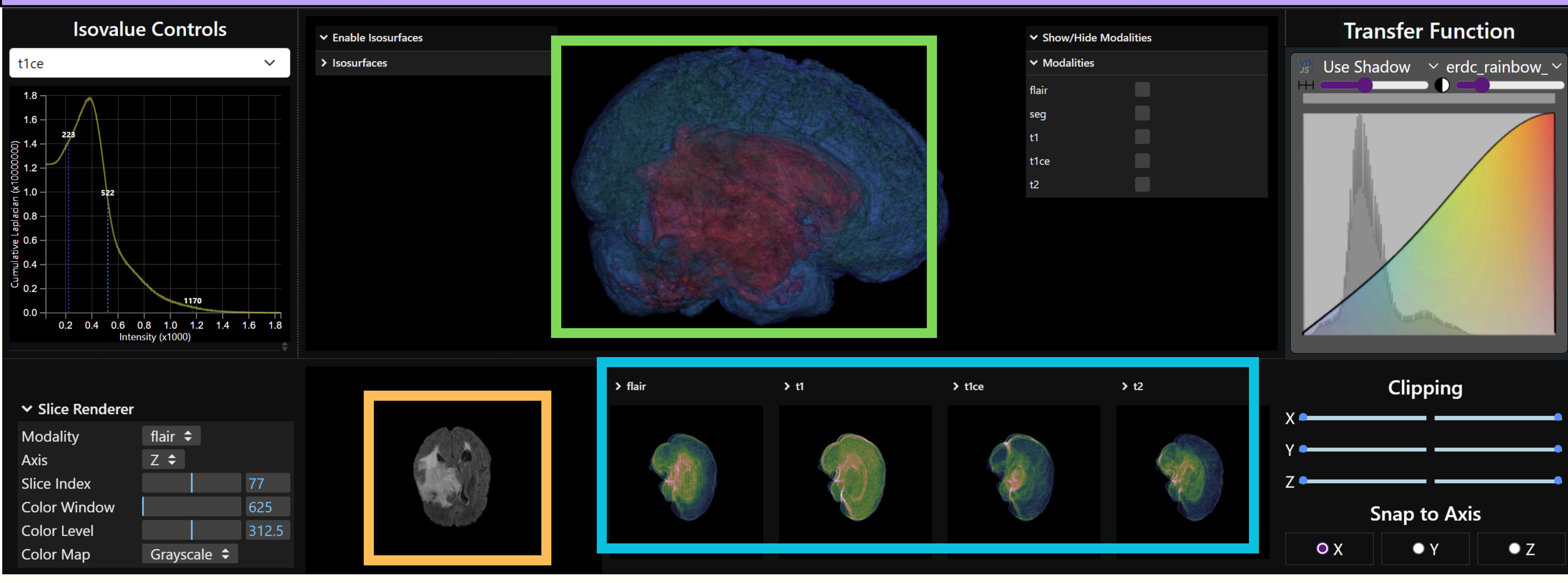


# Vox-Insight: Visualization Tool for Multimodal Medical Imaging Data

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How to steer users to the most informative modalities?

How to best render the data such that the tumor is a prominent feature?

How to drill down on the features found through 3D exploration?

## 2D Overview

Guidance towards tumor-highlighting modalities

## 3D Exploration

Mesh+Volume rendering with auto-coloring

## 2D Analysis

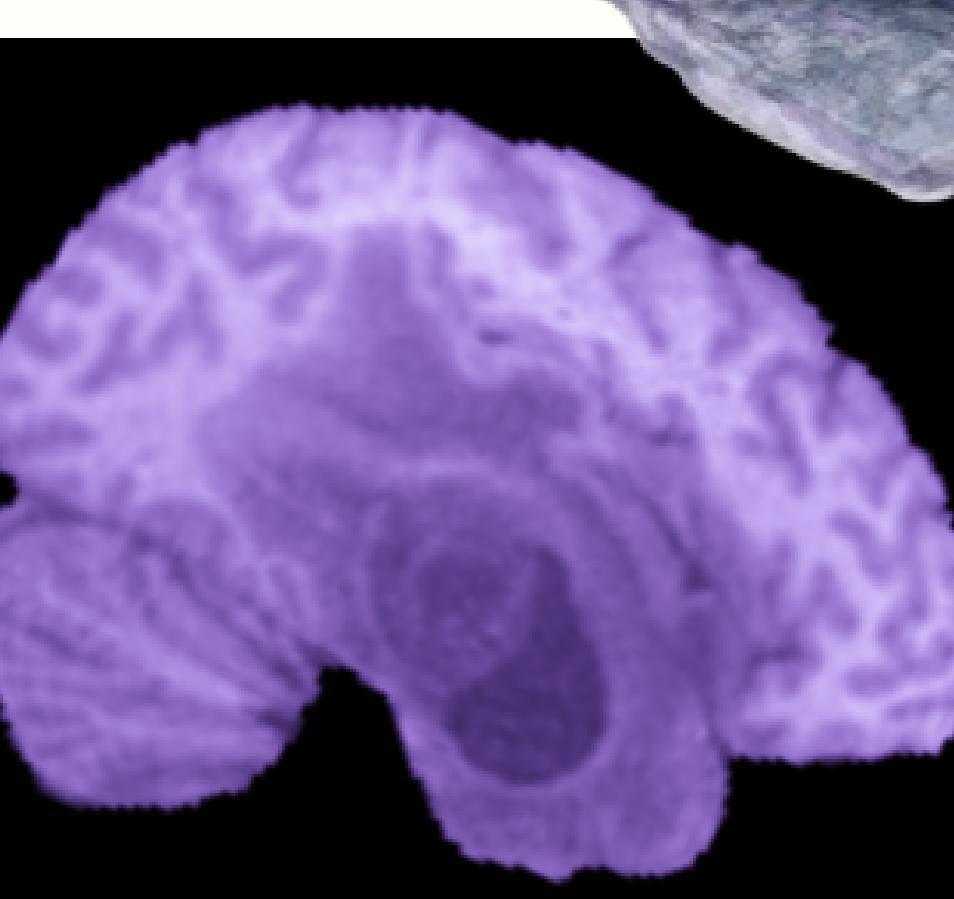
Detailed Analysis for slice-level features

Visualization of aggregated gradients calculated across every modality can help the user find the exact modalities the tumor must appear most clearly in.

For each modality, we extract meshes from candidate isovalue sets, set color/opacity, and use a per-modality 2D transfer function for volume rendering.

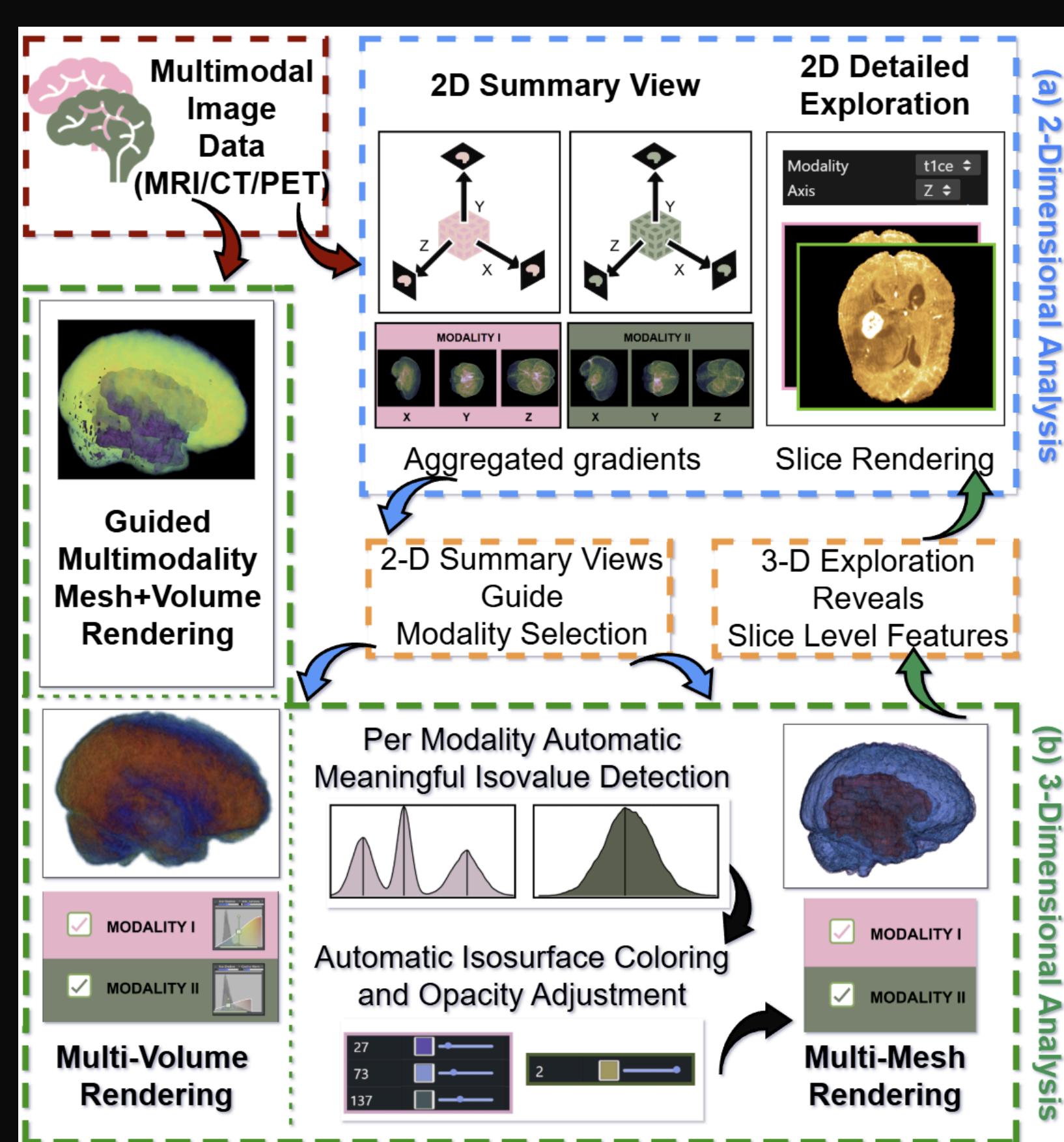
Per-modality slice rendering along axial/coronal/sagittal planes, allowing for a even more fine grained analysis of features observed in 3D.

Pick Modalities to Render



Slice Level Drill-Down

Feature Detection and Coloring



## Main Findings

- MRI modalities complement each other, together they give a fuller picture.
- Automatic opacity determination for mesh coloring clarifies co-registered multi-mesh views.
- 3D shows global structure while 2D slices reveal fine detail for annotation.

## Limitation and Future Work

- Lacks a structured evaluation: plan formal user/expert studies for usability
- Improve isosurface extraction (robustness and speed).
- Automate per-modality transfer-function design.

## Takeaways

- Isolated single modality analysis is not enough to develop a meaningful understanding of medical image and requires simultaneous multimodal visualization.

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