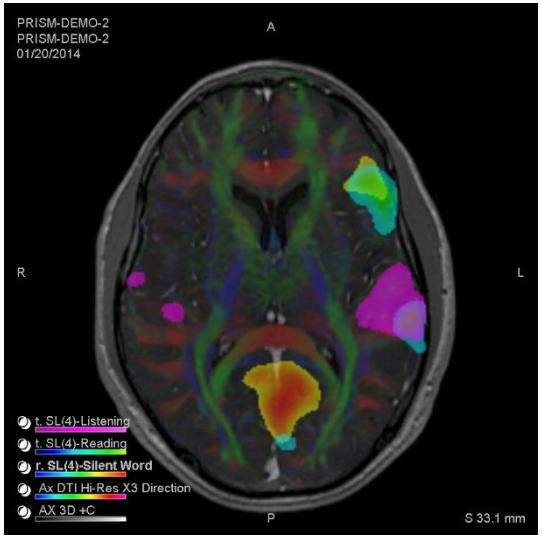
DICOM
Digital Imaging and Communications in Medicine

Supplement 189:
Parametric Blending Presentation State Storage



Overview

- **Objective**
- **Input data**
- **Blending operation**
- **Example**

Objective

Allowing to show spatial relationship of the parametric maps and structural images without loosing the ability to use:

- **Geometry**
- **Spatial and Parametric Information**
- **Thresholds**

Major usage for Surgery and Therapy planning

Is Modality independent

Input Data

Describing the different information sets that will be blended:

- **Structural dataset(s) for anatomy**
- **Parametric Maps for Functional Information**

Blending operation

- **Apply Threshold to highlight the important areas**
- **Supports the use of the Color information in the input datasets**
- **Blends the different datasets in specified order without losing the color information**

Blending operation

Requires Frame of Reference

Supports usage of

- **Padding**
- **Graphics overlays**
- **Segmented Color LUT description**
- **Real World value measurements**

Expects CP 1584 to be finalized for color support in Parametric maps.

Example

Use case is brain mapping for pre-treatment planning.

The goal is to visualize white matter, eloquent cortex for language with respect to the anatomy

- **White matter is done by Color DTI**
- **Eloquent cortex is done by multiple language fMRI paradigms**
- **Anatomy is post contrast T1**

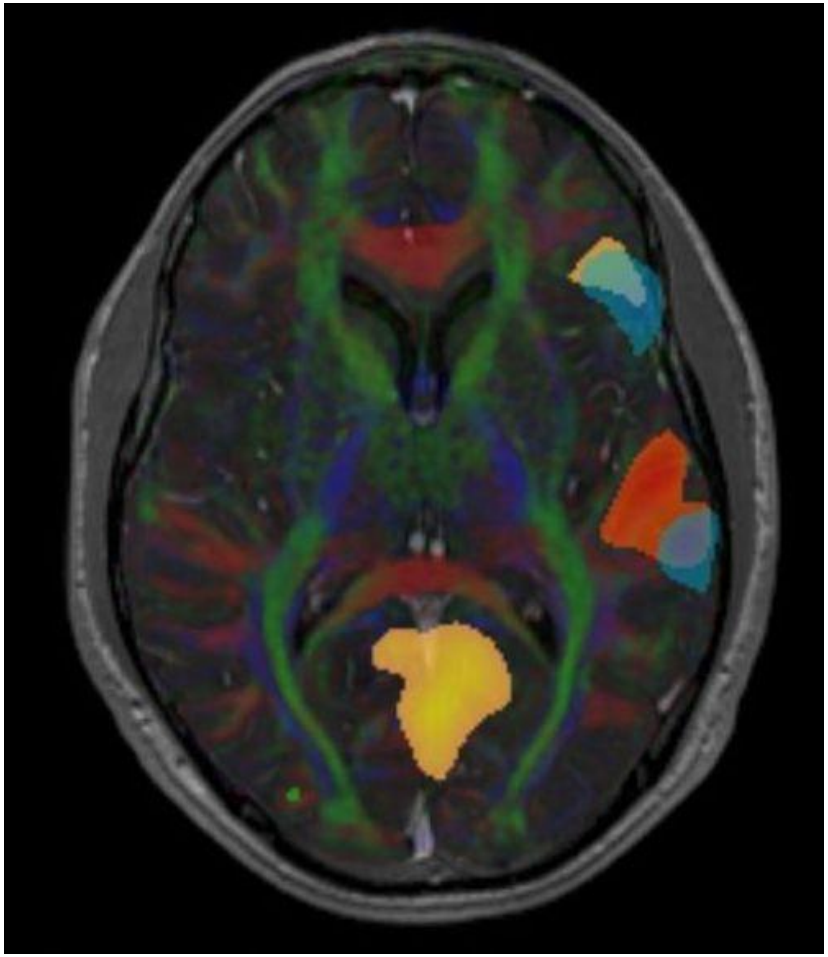
Example Result

View combining:

- **Anatomical image**
- **3 parametric maps**
- **DTI map**

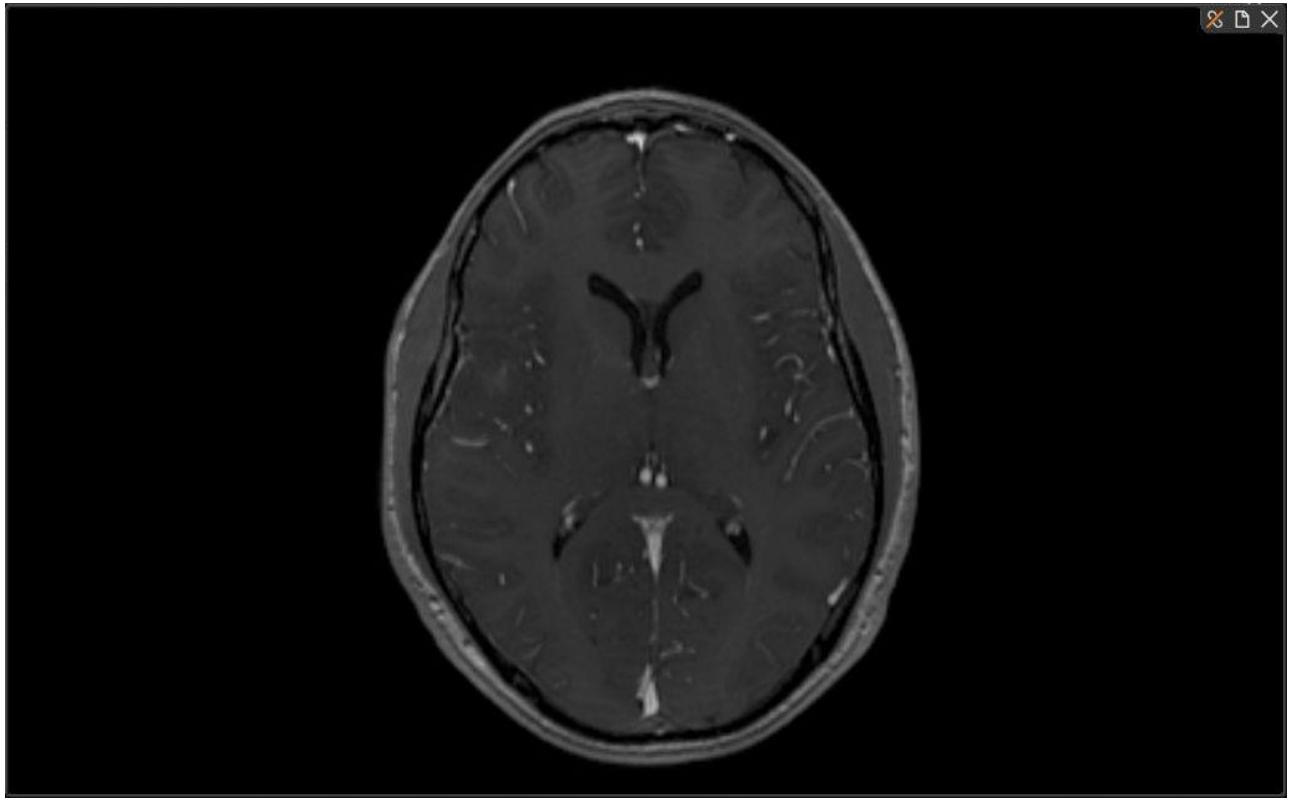
Using:

- **Thresholds**
- **Opacity**



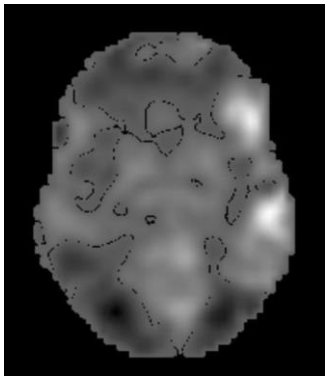
Individual Images

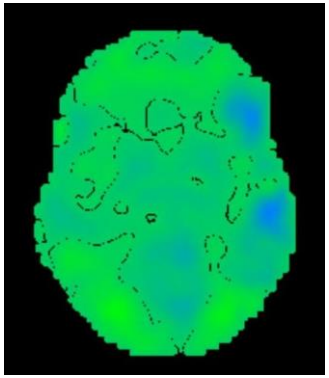
- **Anatomical**

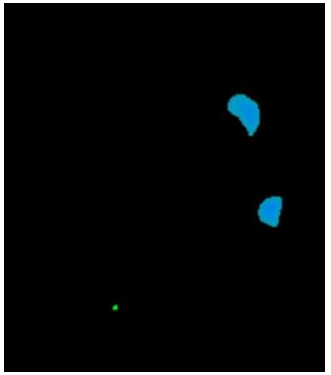


Individual Images

- **Parametric map showing coloring and applying threshold coloring of the image**

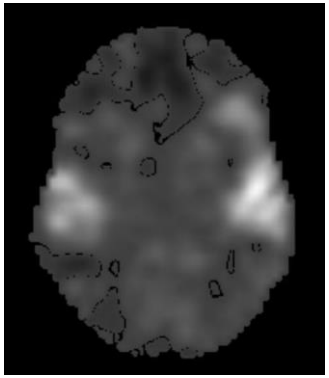


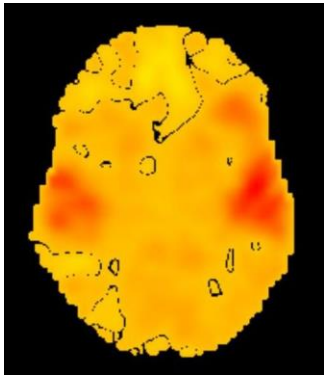


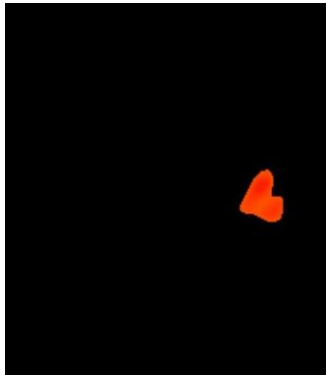


Individual Images

- **Parametric map showing coloring and applying threshold coloring of the image**







Individual Images

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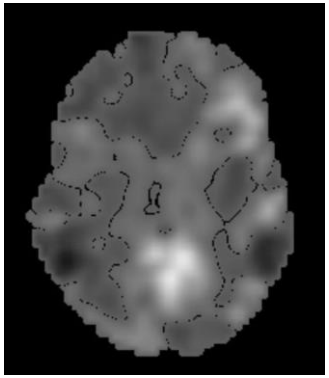
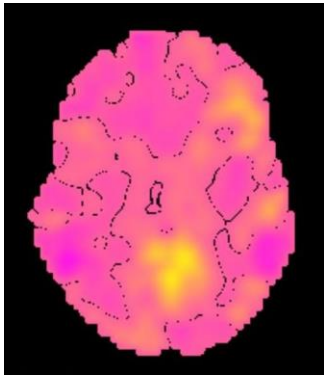
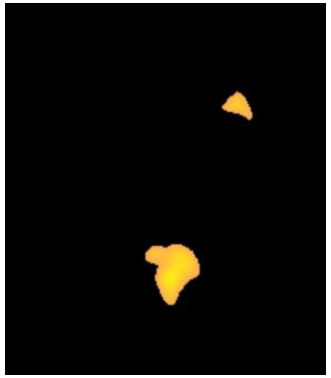
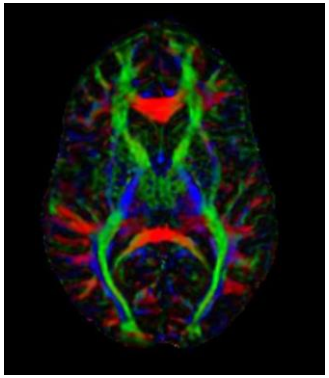




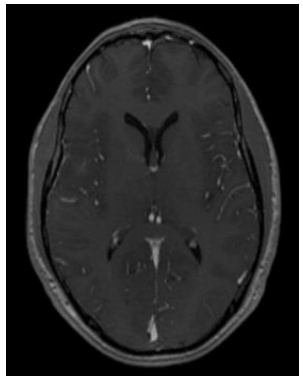


Individual Images

- **RGB image showing the DTI information having no threshold**

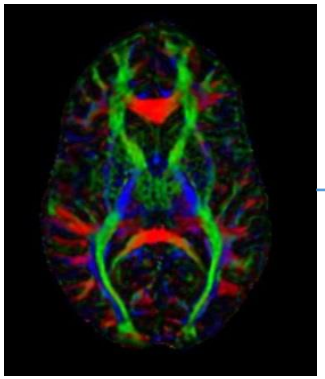


Input images (mono, color and LUT)



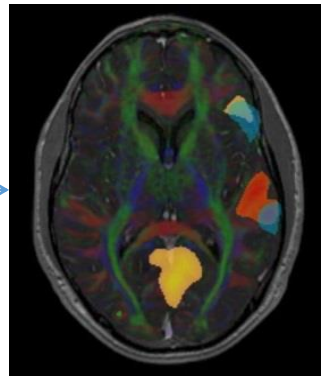
Anatomical
(Relative Opacity 0.7)

+

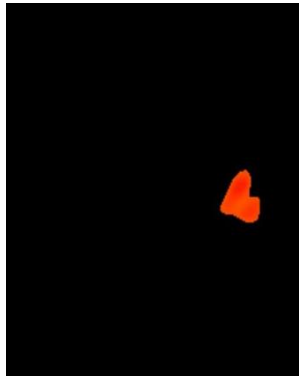


DTI
(Relative Opacity 0.3)

Relative Opacity 0.6

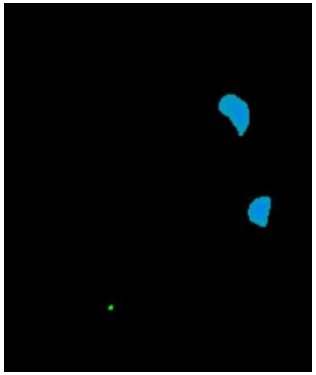


Relative Opacity 0.4



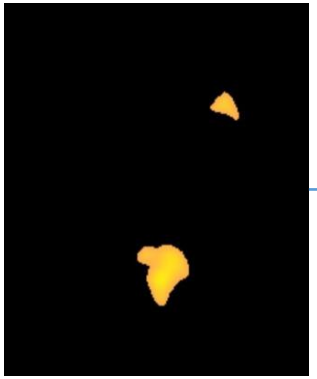
fMRI
(Relative Opacity 0.33)

+



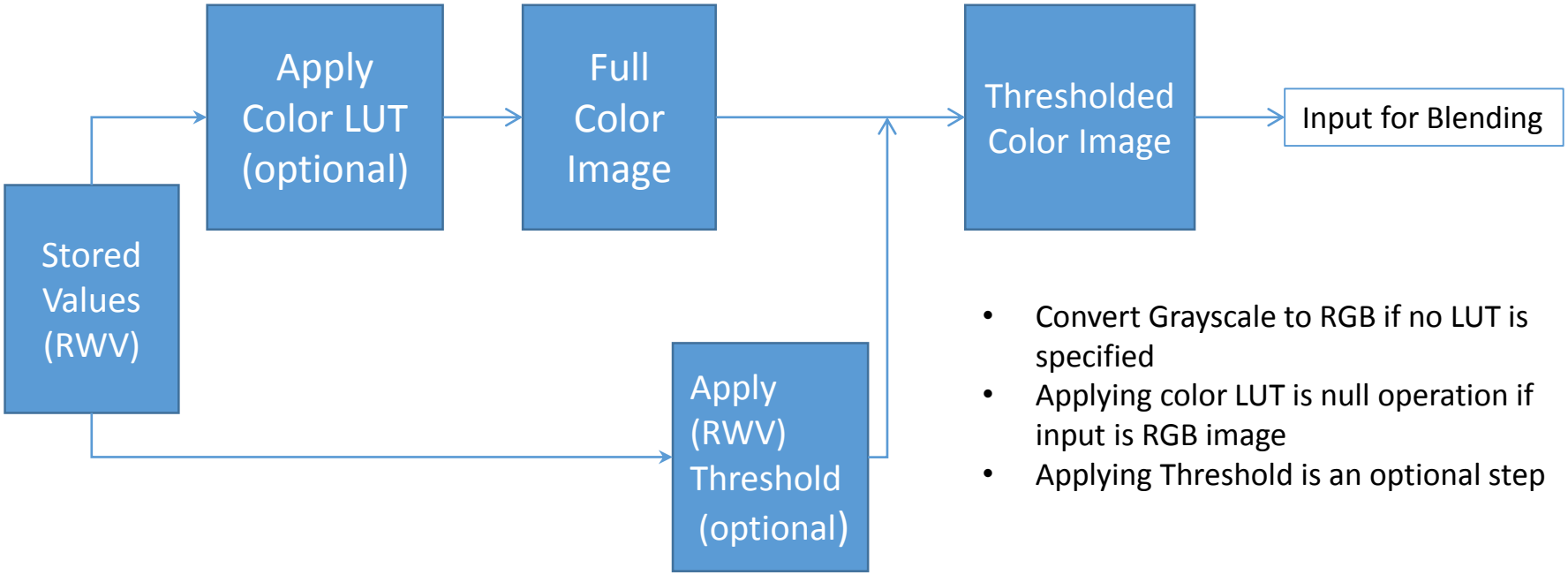
fMRI
(Relative Opacity 0.33)

+

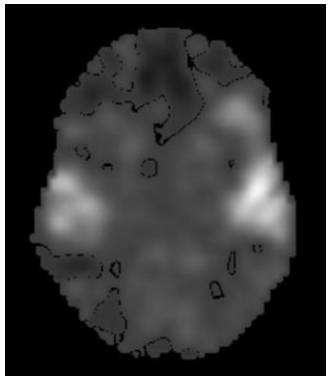


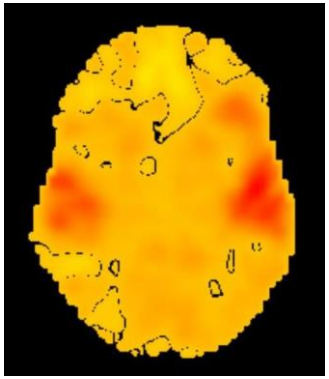
fMRI
(Relative Opacity 0.33)

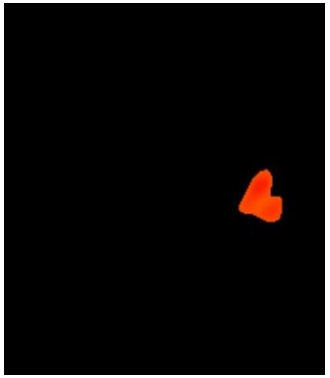
Coloring operation



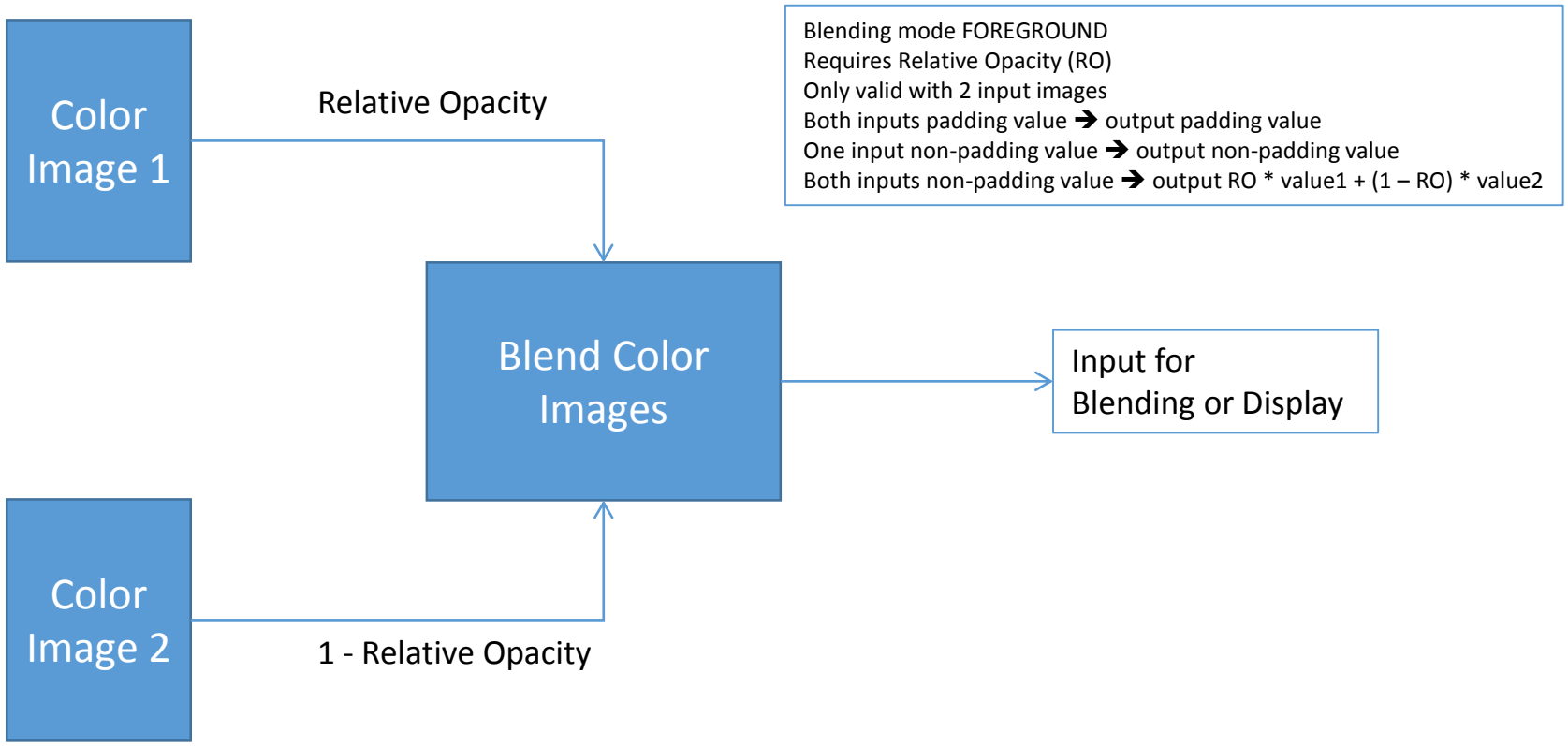
- Convert Grayscale to RGB if no LUT is specified
- Applying color LUT is null operation if input is RGB image
- Applying Threshold is an optional step



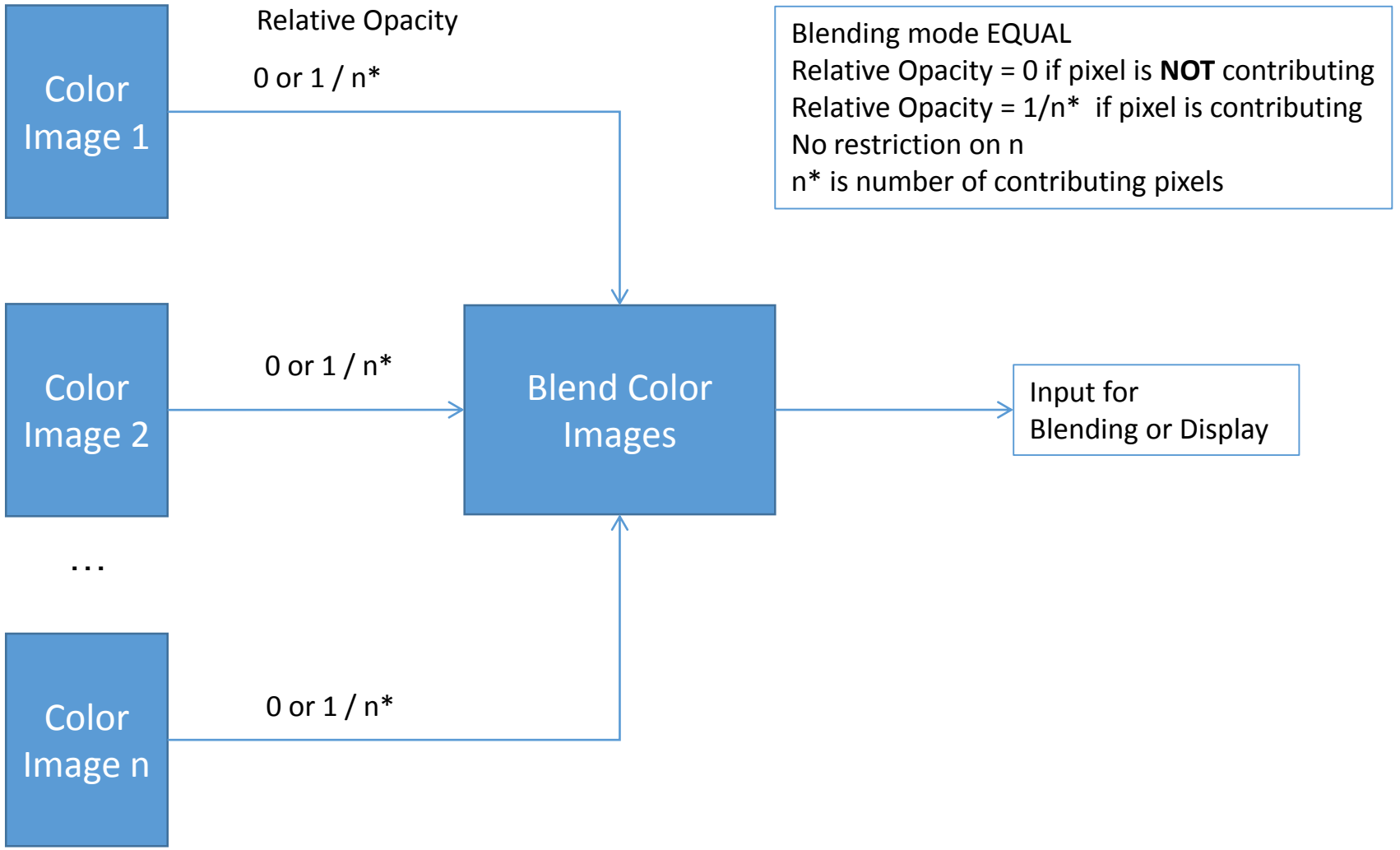




Blending operation

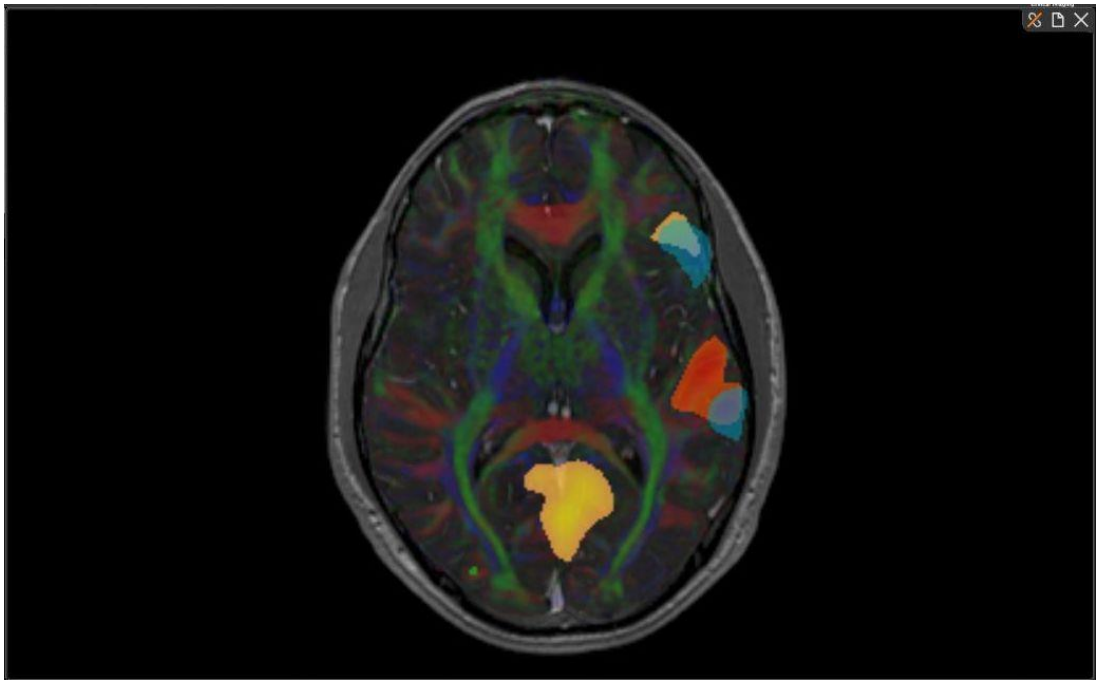


Blending operation



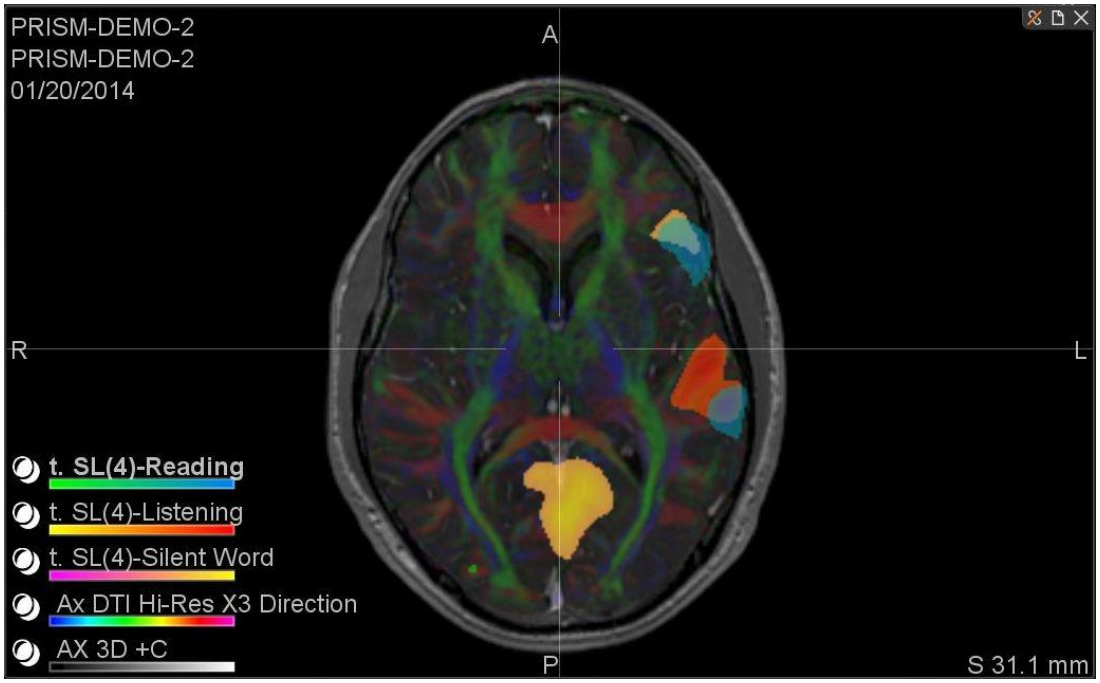
Result view

- **Result view after blending of the different images**



Result view

- **Result view after blending of the different images with application added information.**



What is not specified

- **The algorithms used to make the different spatial datasets map to each other**
- **Windowing of gray scale information before it is colored and blended**