# Spherical Wave Decomposition of Volumetric Digital Imaging Data

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## TECHNOLOGY DESCRIPTION

The present invention presents a novel new approach to resolving MRI data, especially in brain imaging applications. Through the characterization of complex shapes embedded within volumetric data, a deeper understanding is possible for neuronal fibers and brain connectivity. The method has application in both morphological characterization as well as diffusion tensor MRI. Present approaches to this application area employ surface based methods which apply surface segmentation, inflation and surface fitting steps, which in turn lead to inefficient processing times with high error rates. Rather than segment the volume into step-wise concentric surfaces, the present invention applies Spherical Wave Decomposition (SWD) to directly analyze the entire data volume in a more computationally efficient and error-limited software based solution. In a direct comparison against existing volume modeling tools for MRI, SWD showed a better than three-orders of magnitude improvement in processing time with fewer topology reconstruction errors.

## APPLICATIONS

This work will find ready application in any neuroscience application involved in the quantification of changes in the human anatomy, including changes within the brain through aging and disease states. The technology is realized as a software tool which may be adapted to most commercially available MRI systems.

## INTELLECTUAL PROPERTY INFO

Patent pending with software available for evaluation.

## RELATED MATERIALS

- Automated segmentation and shape characterization of volumetric data, Vitaly L. Galinskya; Lawrence R. Frank - 05/15/2014

## PATENT STATUS

| Country | Type | Number | Dated | Case |
|---|---|---|---|---|
| United States Of America | Issued Patent | 10,297,022 | 05/21/2019 | 2014-017 |

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**OTHER INFORMATION**

**CATEGORIZED AS**

- **Imaging**
  - Medical
- **Medical**
  - Diagnostics
  - Imaging

**RELATED CASES**

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