

Title: **Geometric Approach to Segmentation in Diffusion Magnetic Resonance Imaging**

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The anatomy of the biological structures in human brain plays an important role in study and diagnosis of medical conditions. The extraction of these structures in DMR images need appropriate methods and modelling. In this work, two standard segmentation methods are discussed. We have used deformable models and the dimensionality reduction method to project the data from high dimension to very small dimensions. On the projected lower dimensional data, we employed the classical k-means clustering for segmentation. Novelty in this work consists in exploitation of the similarity measures for the voxels based on the properties of Riemannian symmetric spaces, as well as quaternionic representation of transformations and their polar decompositions.

[Video](#) , [thesis](#)