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Tractography Based Visual Diagnostics

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Dresden, May 20, 2020

Task Description

The aim of the project is to perform visual diagnosis of healthy and diseased subjects based on fiber tracts derived from diffusion MRI (dMRI) volume of the human brain. The goals are:

- 1) Literature review on state-of-the-art methods and toolboxes related to dMRI volume pre-processing, fiber orientation estimation, fiber tracking and tract segmentation.
- 2) Pre-processing of the dMRI datasets to eliminate noise and prevalent distortion/motion correction.
- 3) Study and implementation of fiber orientation estimation at a single voxel resolution of dMRI volume.
- 4) Study and implementation of fiber tracking and segmentation methods using Region of interest (ROI).
- 5) Qualitative and Quantitative evaluation of tracking and segmentation methods for healthy and diseased subjects.

Note: The team consists of 4 members with 3 participants for CMS-VC-TEA.

Optional goals:

- a) Study and implement a VR user interface to perform immersive evaluation of fiber tract results.

Declaration of authorship

I hereby declare that I wrote this thesis on the subject

Tractography Based Visual Diagnostics

independently. I did not use any other aids, sources, figures or resources than those stated in the references. I clearly marked all passages that were taken from other sources and cited them correctly.

Furthermore I declare that – to my best knowledge – this work or parts of it have never before been submitted by me or somebody else at this or any other university.

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1 A chapter

1.1 A section of the chapter



Figure 1.1: This is a caption

1.1.1 A subsection: Some Math

$$\sum_{i=1}^{100} x_i$$

more text here

1.1.1.1 Referencing literature

This is how you can cite some literature from "literature-example.bib": [?].

```
//comment
for(int i = 0; i < 100;i++)
{
    test(i);
}
```

a code listing text

[]

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