Master thesis project: Creating hemodynamic atlas of aorta

Project description

Hemodynamic atlas is the atlas showing the expected blood flow pattern in a specific patient group. The hemodynamic atlases can teach us more about cardiovascular diseases and they can be used to diagnose and categorize patients.

The aim of the project is to develop a method to create hemodynamic atlases automatically using 4D Flow MRI data. 4D Flow MRI is an imaging technique which enables us measure blood flow non-invasively.

The project will include the analysis of 4D Flow MRI data of healthy volunteers and patients with aortic diseases and the development of methods to create hemodynamic atlases. The developed methods will be eventually used by other researchers to obtain hemodynamic atlases of different vessels and to answer different research questions.

The tasks:

1. Design of the project plan together with the student
2. Discuss different methodologies and identify the best method to create the hemodynamic atlas
3. Implement the method to create turbulent kinetic energy atlas
4. Evaluate the method in healthy volunteers and patients with aortic diseases
5. Write master thesis

Student profile: suitable for biomedical/ electrical engineering students.
Available: immediately
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