MEDILAXY
A Galaxy Platform For Medical Image Analysis

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July 1, 2013
The motivation

- Multiple sclerosis (MS)
- MRI – water diffusion in the brain
- Spatial-dependent properties
- Different regions:
  - Inferior Cerebellar Peduncle
  - Supratentorial
- Different groups:
  - Patients
  - Controls
  - NAWM
Why Galaxy

- Integrated collection of tools:
  - Filling/querying database
  - Different plot types
  - Correlation studies
  - Statistical tests
  - \text{LaTeX} reports

- Online platform for sharing data
- Easy to use web interface
- Hiding the programming part to users
- Integration with genetics data (existing tools in galaxy)
Input data

- Acquiring MRI images
- Combining images
- Noise reduction
- Estimation of diffusion tensor
- Fiber tracking
- Selection of fibers
- Selection of patients
- SPM (MATLAB tool), Fiberviewer, MRICron, python modules
Workflow

- sqlite
- generateDS
- matplotlib
Medilaxy – Current state and perspectives

Current state

- Not online
- Results for the original study:
  - MAGNIMS talk in Milano (8-9 November 2012)
  - Article in preparation
Perspectives

- Including some preprocessing steps:
  - integrating Fiberviewer
  - studying tractography algorithms
  - segmentation images
  - denoising

- Allowing user to modify python scripts
- Add plot options
- Study MS time evolution
- Including genetic studies
- Supporting more formats
Thank you for your kind attention
Any questions?

- Johannes Gutenberg University
  - Prof. Dr. Andreas Hildebrandt
  - Dr. Katerina Taškova
  - M.Sc. Sonika Rao

- Saarland University
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