

MEDILAXY: A Galaxy Platform for Medical Image Analysis

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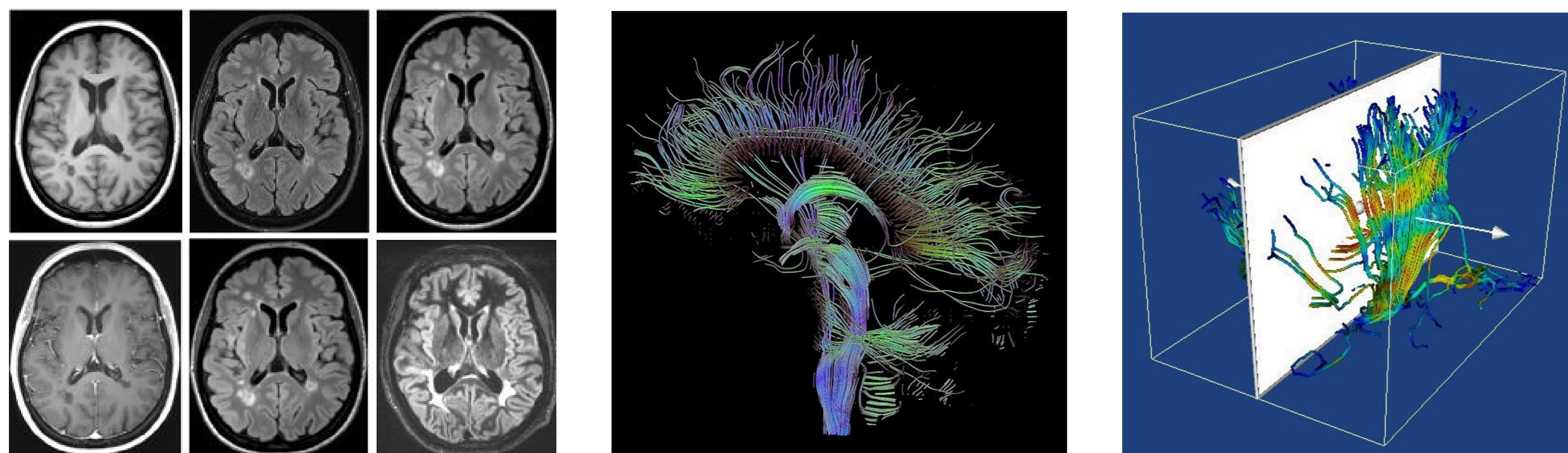
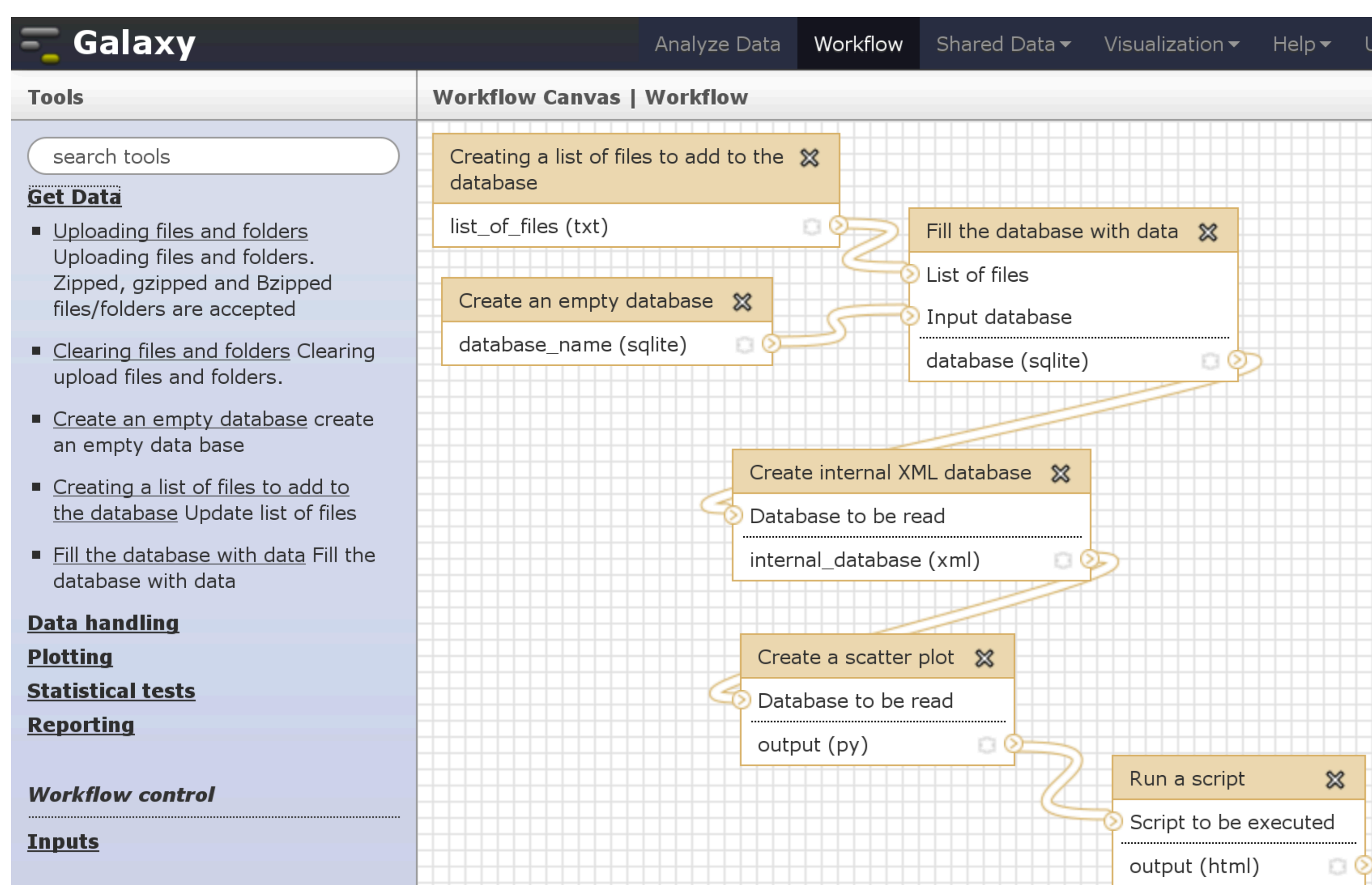


Focus

Medilaxy is a **workflow system** for investigating and modeling of **diseases of the central nervous system** like Multiple Sclerosis. It is focused on **Magnetic Resonances Imaging (MRI)** data to study spatially varying properties, such as diffusion indices along brain white matter fibers, and offers tools for detecting statistically significant differences in the relevant quantities along fibers crossing MS lesions. Medilaxy is based on the **Galaxy framework**, a bioinformatics work flow management system and integration platform for biological data.

Why Galaxy?

- Online platform for sharing data
- Easy to use GUI for many different languages
- Tool programming parts are hidden to users
- Collection of statistical tools available
- Galaxy hosts numerous other bioinformatics tools
- Tools can intuitively be connected to workflows

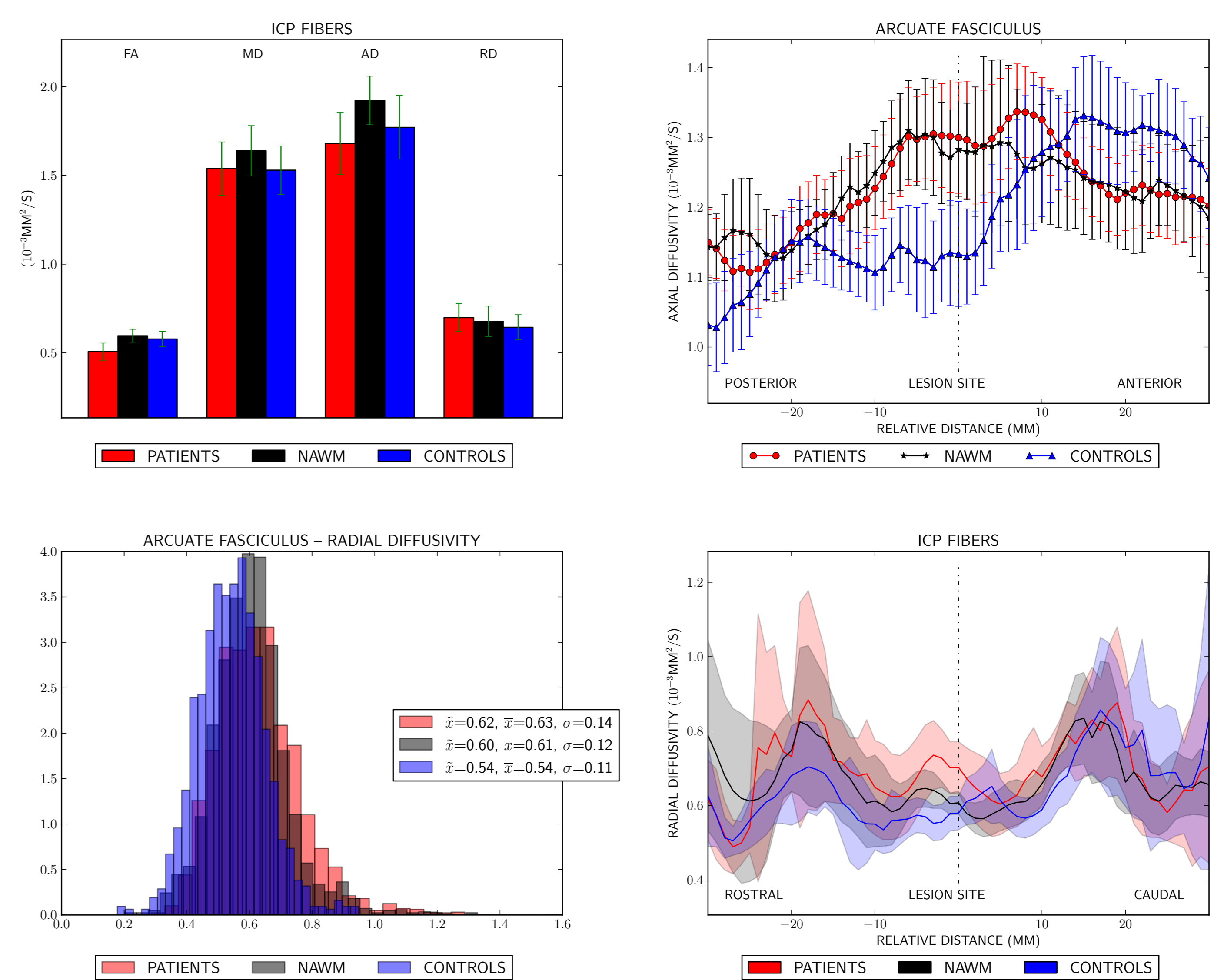


Preprocessing

- Acquire MRI images, register and denoise
- Evaluation of diffusion tensor
- Fiber tracking
- Extraction of fibers crossing lesions

Medilaxy tools

- Importing data with FTP
- Creating and querying a database with the data, selecting group of interest
- Different plot types (histograms, barplots, scatterplots)
- Different plot formats (all the ones in matplotlib)
- Statistical tests (correlations, Kolmogorov-Smirnov, Mann-Whitney)
- L^AT_EX reports

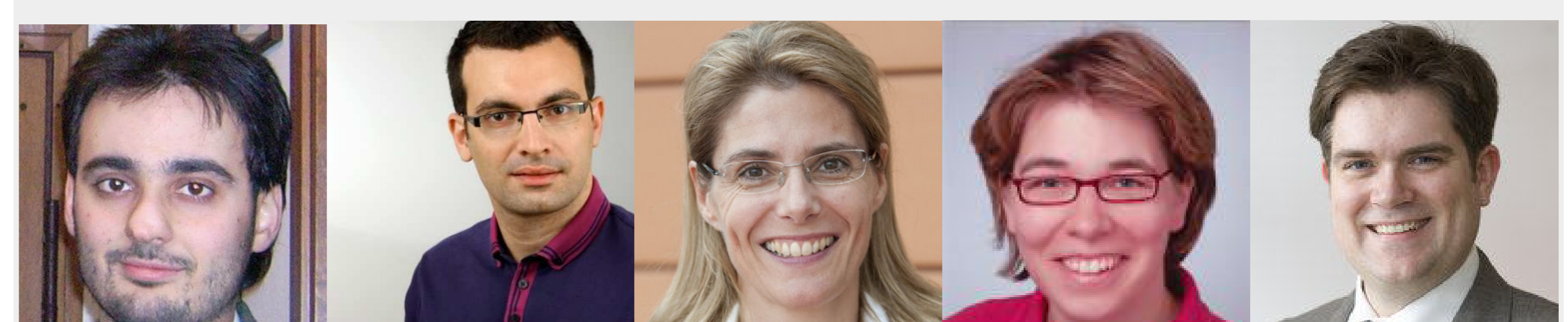


Perspectives

- Integrating **fiber tracking** and analyzing tractography algorithms impact on results
- Adding segmentation of images, registration and denoising tools
- Allowing user to **customize** queries, python scripts and plots
- Studying MS time evolution
- Including **genetic studies**
- Supporting more file formats

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