

# **SepINRIA v1.7.2: Multiple Sclerosis Brain MRI visualisation, comparison and analysis Software**

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## Background:

SepINRIA is a software offering visualisations, comparisons and analysis of Multiple Sclerosis (MS) brain MRI.

## Objective:

The aim of this project is to provide clinicians with a tool allowing to quantify lesion burden and atrophy.

## Methods:

SepINRIA works on a convenient database in which new DICOM files can be added. Images can be visualised in 2D or 3D. Two images (either of the same or different sequences) can be aligned and visualised in the same window (side to side or by image fusion).

Lesion segmentation can be obtained manually, semi-automatically or fully-automatically from T1, T2, PD and T2-FLAIR sequences. Quantitative values (number of lesions, volume...) are then computed. Manual and semi-automatic modes can be used to perform a segmentation of reference. In this case, a quantitative comparison of the segmentations can be realized.

Manual and automatic brain atrophy evaluations are available too. In the manual method, specific points have to be identified. Then distances between these points are computed and give linear measures (width of brain, lateral ventricles and third ventricle). In the automatic method, the brain parenchymal fraction (BPF) is computed from an automatic segmentation of the brain based on T1, T2 and DP sequences and taking into consideration partial volume effects. This is done simultaneously for each date of exam. Evolution of the BPF reflects the atrophy.

The use of SepINRIA has been simplified and optimised. Data can also be exported into DICOM files.

## Results:

SepINRIA is available on Linux, MacOSX, Windows and can be downloaded at:

<http://www-sop.inria.fr/asclepios/software/SepINRIA/>

## Conclusion:

We developed a software to analyse MS brain MRI. Images alignment function can already be useful in clinical context. Automatic lesion segmentation and evaluation of brain atrophy are still belonging to the research field. Neurologists can perform lesion segmentation or atrophy measurements of reference thanks to manual lesion segmentation and linear measurement functions.