

## Region management toolkit for atlas-space image processing

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**Purpose of the software:** Digital brain atlases offer a prominent solution for the anatomical localization of the physiological characteristics and pathological disorders of the brain investigated by MRI studies. The choice of the appropriate region system is a cardinal issue in various image processing tasks emerging by studies on relationships of brain structure, function or connectomes. The purpose of the presented software package is to afford a complex region management toolkit and provide the opportunity of constructing special, easily exportable region systems based on the regions of multiple brain atlases.

**Methods/Implementations/Hardware Requirements:** Using the multi-atlas framework developed in our institute, regions of various brain atlases can be collected and used simultaneously. To merge these and optionally other user-defined regions to a uniform region system adaptable for arbitrary atlas-space image processing tasks some general and more specific set operations were implemented. The software is built upon the MultiModal Medical Imaging software library system ([www.minipetct.hu](http://www.minipetct.hu)) and runs on Windows 7 and Windows Xp operation systems and various Linux distributions. The hardware requirements of the application match the current average PC configurations used in medical image analysis.

**Features illustrated at the exhibit:** Our institutional brain connectivity research project is highly promoted by the presented system. At the exhibit the features of the software are presented by constructing multi-atlas based bilateralized region systems specially adaptable for brain connectivity analysis based on resting state fMRI and DTI data.