LONI Software

Biomedical imaging includes a diverse array of modeling, analysis, and visualization software.

LONI Pipeline

Is a graphical framework for development, maintain, and dissemination of neuroimaging data analysis protocols. The pipeline environment offers a scalable infrastructure for graphical integration of diverse, complex, and heterogeneous software. Modules and processing workflows, includes segmentation, shap analysis, and cortical thickness workflows.

LONI Research Protocols

LONI research protocol supports neuroimaging investigation of brain structure, function, and physiology in health and disease by using comprehensive imaging analysis.

Techniques in Neuroimaging

CT (Roentgen-Ray Computed Tomography)

A beam of x-ray passes through the brain and is detected according to the density of the tissue encountered. Detectors positioned around the circumference of the scanner collect attenuation readings from multiple angles. A computerized algorithm reconstructs an image of each slice.

MRI (Magnetic Resonance Imaging)

Protons in a magnetic field receive and then transmit electromagnetic energy. The strength of the transmitted energy is proportional to the number of protons in the tissue. Signal strength is modified by properties of each proton’s microenvironment, such as its mobility and the local homogeneity of the magnetic field. MRI signal can be weighted to accentuate some properties and not others. When an additional magnetic field is superimposed, one which is carefully varied in strength at different points in space, each point in space has a unique radio frequency at which the signal is received and transmitted. This makes constructing an image possible, represent the spatial encoding of frequency.

SPECT/PET (Single Photon / Positron Emission Computed Tomography)

­­­­­­Radiolabeled compounds are injected and the compound photon emissions are detected. The images are made from representation of accumulated labeled compound. The compound reflects either blood flow, oxygen or glucose metabolism, or dopamine transporter concentration.