

LONI Image Data Archive



IDA Data Management

- Multiple data sharing levels within projects
- Archiving
- Visualization
- Querying
- Forming data collections
- Downloading

The image shows two overlapping browser windows from the LONI website. The background window displays 'Image Database Search Results' with a table of search results. The foreground window shows the 'LONI Image Viewer' interface, which includes a central image of a brain slice, navigation controls, and a 'CHANGE BASE VIEW' section.

Subject	Species
000_0102	Human
000_0103	Human
000_0104	Human
000_0105	Human
000_0106	Human
000_0107	Human
000_0108	Human
000_0109	Human
000_0110	Human
000_0111	Human
000_0112	Human
000_0113	Human
000_0114	Human
000_0115	Human
000_0116	Human

LONI Image Viewer

SELECT IMAGE & VIEW

AXIAL SAGITTAL CORONAL

SELECT SLICE

Change Slice Number: 1

CHANGE BASE VIEW

VIEW ZOOM SLIP

Display mouse in the image area for zoom

WINDOWING & CONTRAST

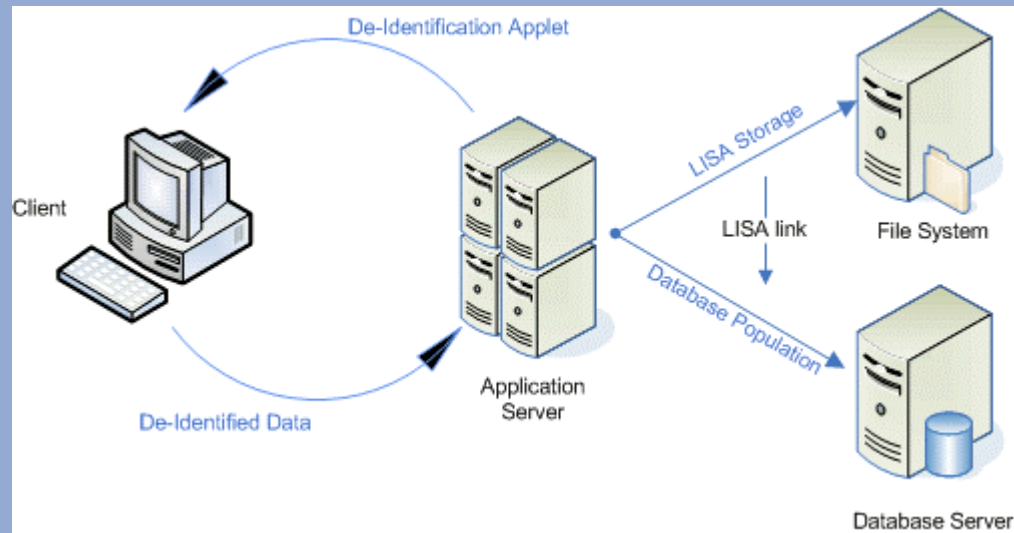
Windowing: Contrast

RESET BASE



Archiving Overview

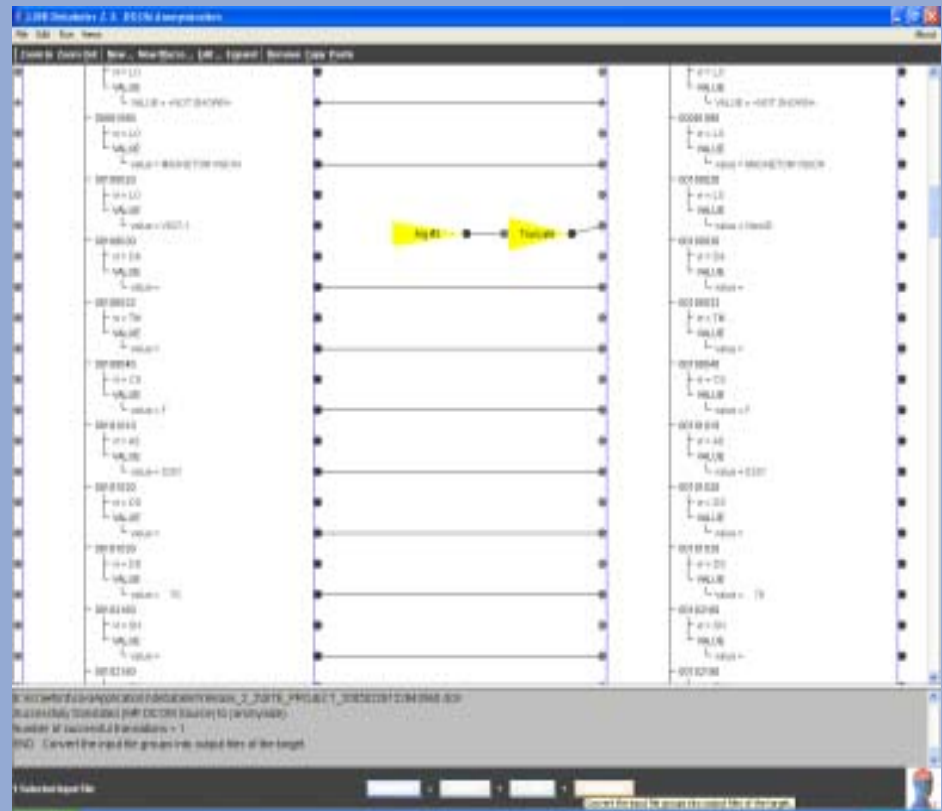
- De-Identification
- Transmission
- Storage
- Database Population



De-Identification Overview

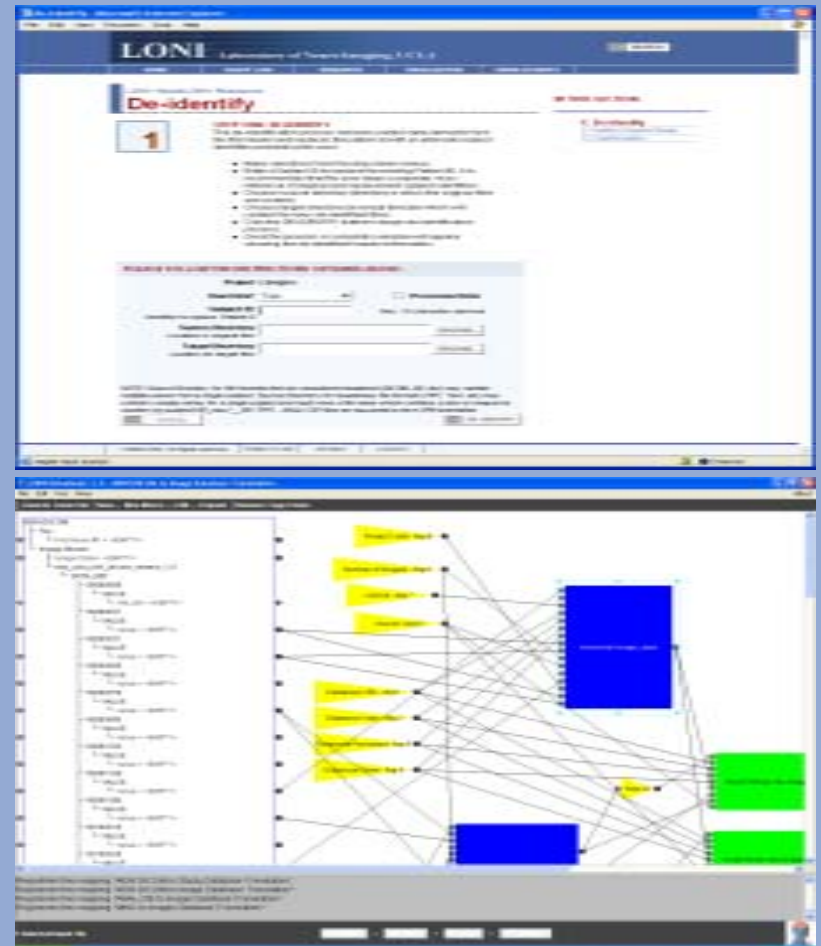
Debabeler translations

- Step 1: Source Identification
 - Detect file format
 - Detect scanner make
- Step 2: Grouping
 - Detect series
- Step 3: Translation
 - Remove/replace patient identifying data
 - Create de-identified data files



Database Population

- Metadata sources
 - User-supplied metadata is entered via the web GUI
 - Image header-supplied metadata is extracted via source-specific Debabeler mappings

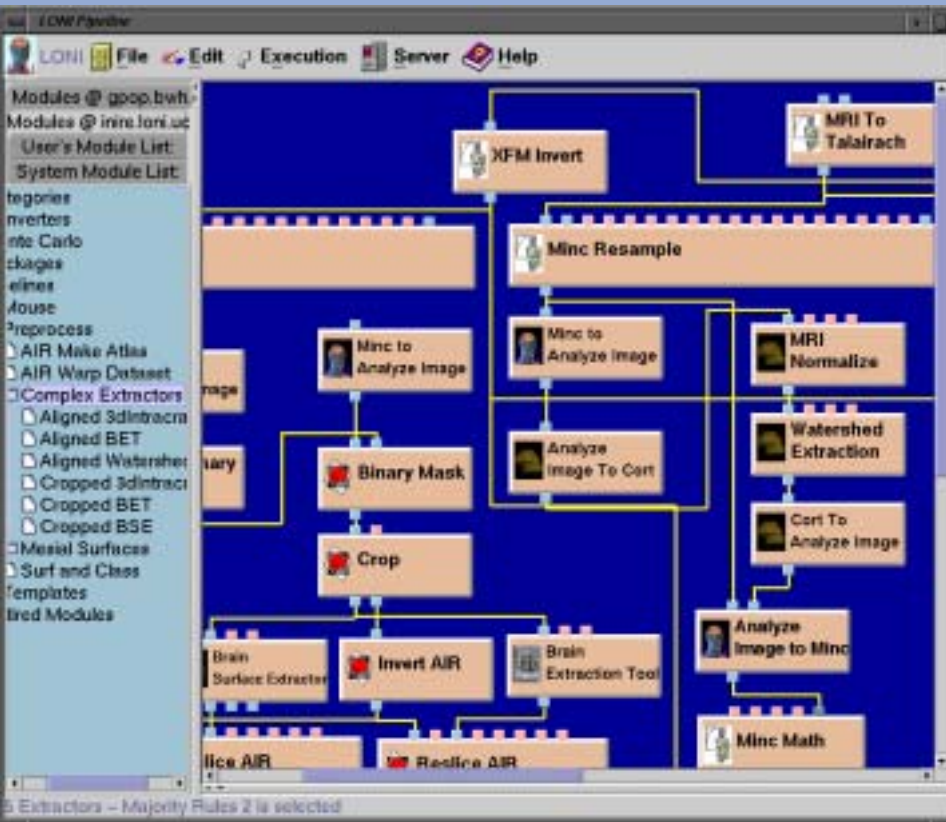


Storage

- LONI Information Storage Architecture (LISA)
 - Provides encrypted transfer of files between sites
 - Enforces permissions
 - Enables an efficient transfer of many files at once (less protocol handshaking eliminates the overhead of transferring many little files)
 - Assigns an identifier to each file that is unique across sites



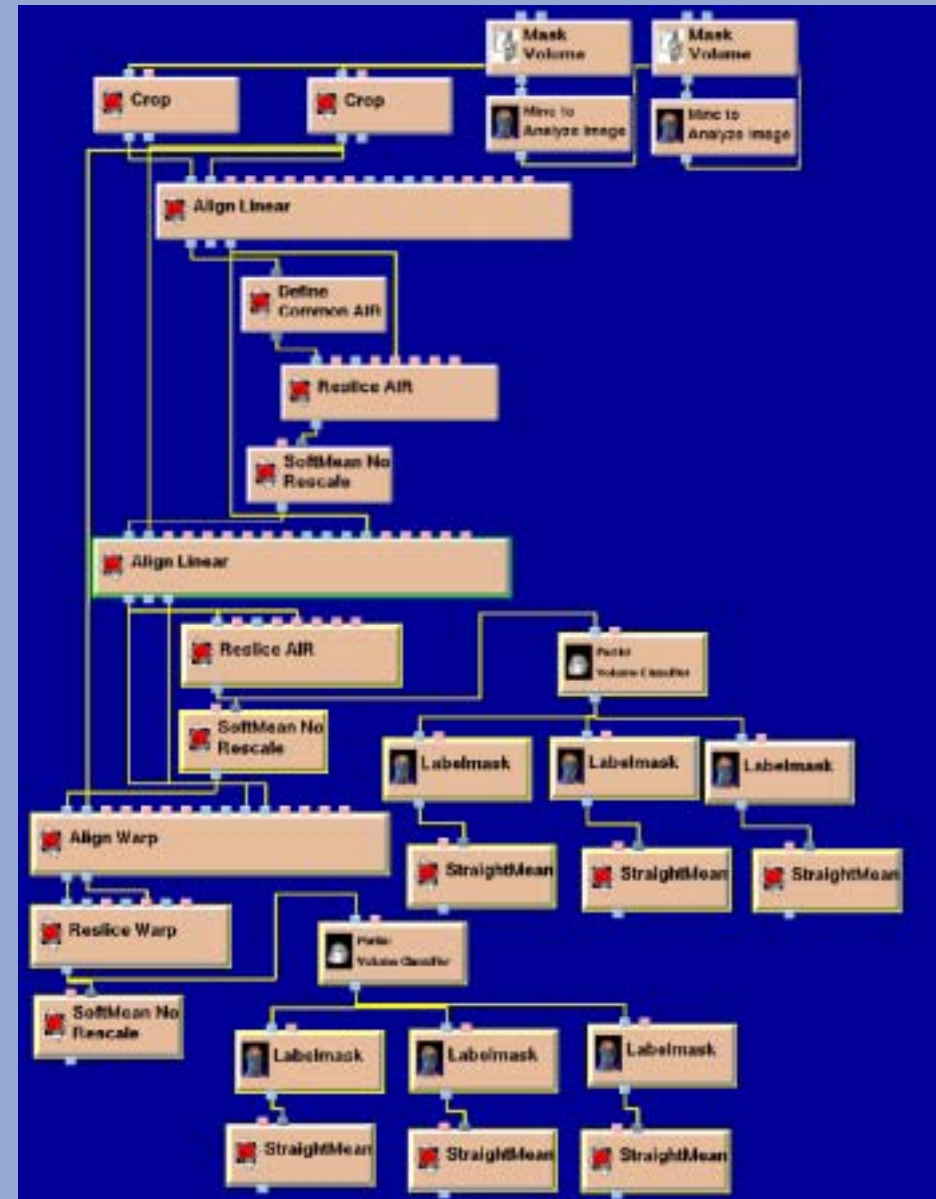
Principles of an Integrated Processing Environment



- General
 - Capture current and future modular package designs
- Interoperable
 - Seamless interaction of different packages
 - Platform independent
- Simple and flexible
 - Visual programming
 - Custom methodology
- Powerful
 - Dataflow execution model
 - Distributed computing

Example – Atlas of Normal Young Adults

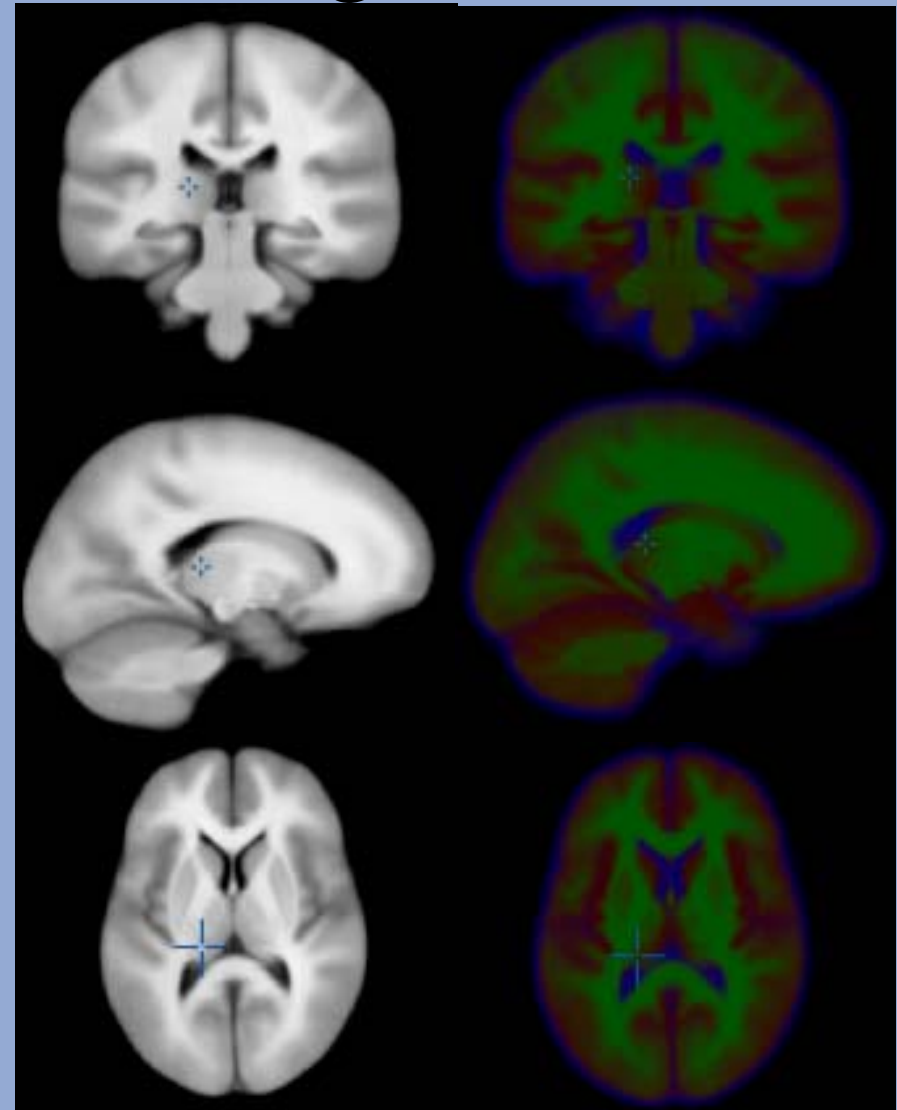
- T1-weighted MRI average of 452 subjects in a linearly least distant space
- Final registration to atlas space is non-linear
- CSF, gray and white matter probability maps generated in atlas space
- Modify inputs for atlases of new populations



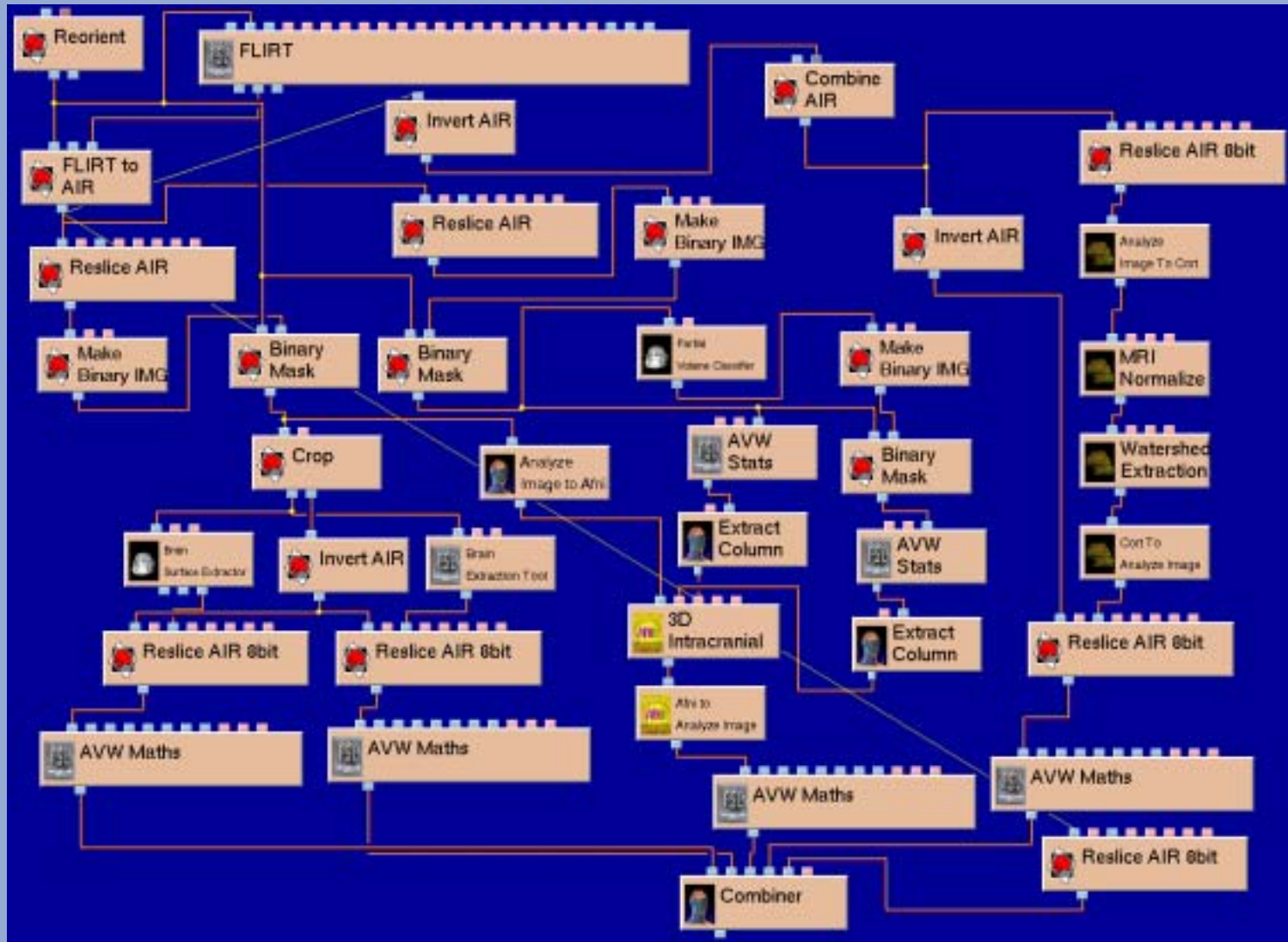
Atlas of Normal Young Adults

Processing

- 19 hours of processing using 48 processors
 - 81% processor efficiency
 - 31 days for a single processor
 - Without automation, analysis requires > 4000 man hours
 - 15391 intermediate files – 46.3 Gb
- Controlled by a laptop (PIII)



Brain Extraction Meta-Algorithm



FSL; BET; BSE; AFNI (3d Intracranial); FREESURFER (MRI Watershed)