PRIME 2014 BRISBANE AUSTRALIA

PROJECT:

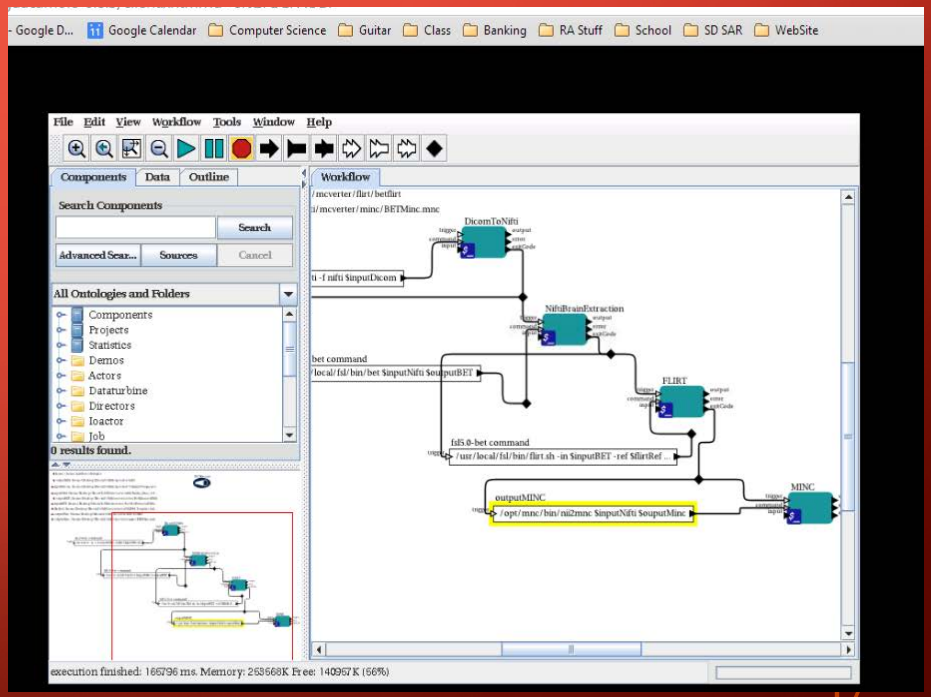
KEPLER WORKFLOWS FOR MRI IMAGE GENERATION

WEEK 8 AUGUST 25TH REPORT

BY MATTHEW SCHWEGLER

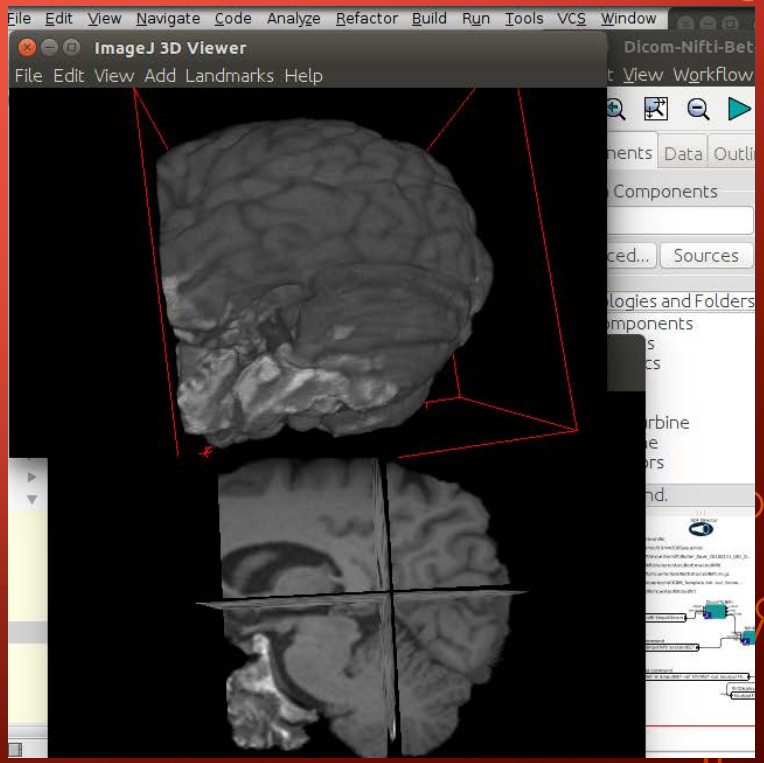
KEPLER ONLINE PORTAL

- Kepler workflow integrated into online portal
  - CentOS VM created with correct files/programs installed
    - FSL, ImageJ, MINC Toolkit
  - Created bash files so the online portal could correctly access programs inside the Virtual Machine
  - Changed final output to MINC instead of NIFTI for 2D display supported inside the online portal
  - Added extra step to facilitate MINC convertion from NIFTI format



SUMMARY OF FINDINGS

- Kepler and 3D Image Display
  - Kepler is a exceptional platform for 3D image display and many java based imaging tools exist to extend Keplers display functionality into the 3D realm.
    - Using tools such as ImageJ, Java3D, 3D Viewer (Extensions to ImageJ)
    - These java programs can be easily integrated into Kepler as my Display3d actor exemplifies
    - Further development could easily lead to more robust tool sets as well as useful 3d display actors for things outside of MRI imaging.



SUMMARY OF FINDINGS

- Kepler FSL Neuroimaging Tool Integration
  - FSL does not integrate seamlessly into Kepler but useful workflows can be generated.
    - FSL is the primary toolset used by the Neuroimaging community but is written in C++ so it is not natively supported by Kepler
    - The Neuroimaging community primarily utilizes scripts to execute chains of FSL commands so Kepler is a good solution to organize their workflows better.
    - Using execution actors within a Virtual Machine with FSL installed one can create functional workflows that can execute all of the FSL toolset
    - Work could be extended into Nimrod K as several FSL tools are CPU intensive such as FLIRT which preforms a linear regression on 3d images.
    - There is also promise in using the Kepler Online Portal as a means for Neuroimaging scientists to use Kepler to simplify their workflows

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