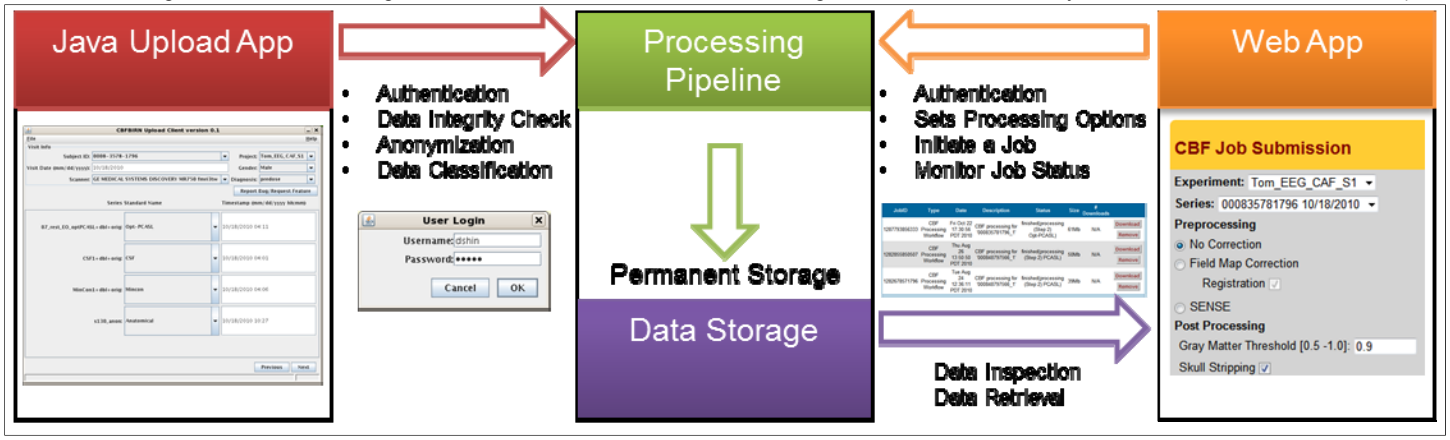
# AN ONLINE SHARED DATABASE OF ASL-BASED CBF MEASURES WITH INTEGRATED PROCESSING PIPELINE

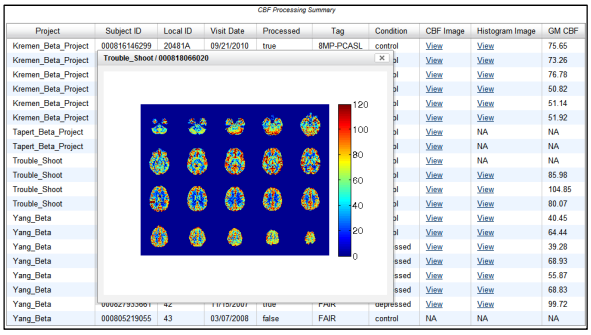
**D. D. Shin[1], B. I. Ozyurt[2], and T. T. Liu[1]**
[1]Center for Functional MRI, University of California, San Diego, La Jolla, CA, United States, [2]Department of Psychiatry, University of California, San Diego, La Jolla, CA, United States

**Introduction:** Arterial spin labeling (ASL) can provide a quick and accurate measure of cerebral blood flow (CBF). A rapidly growing number of CBF measures are being collected both in clinical and research settings around the world, creating a large volume of data across a wide spectrum of study populations and health conditions. However, without a concerted effort to collect, integrate, and share this large volume of data, the potential benefits of this data may not be fully realized. Here we present our first version of an online shared database with an integrated processing pipeline for CBF quantification. The system is built upon the infrastructure of the Biomedical Informatics Research Network (BIRN) Human Imaging Database and is dubbed the CBF Database and Analysis Pipeline (CBFDAP). The objective of this abstract is to inform the MRI research community of its availability and to provide a description of its current capabilities.

**Methods:** The figure below shows a high-level overview of interaction with and usage of the CBFDAP. The system runs on a dedicated server (Dell




Power Edge R710) and a mirrored backup server. It provides two main tools of interactions, i.e. a Java Web Start based data upload application and a web interface (http://cbfbirn.ucsd.edu), both of which can be accessed via the same user login/password. *Data Upload*: The platform independent Java upload application is used to browse, select, and upload CBF datasets in DICOM, AFNI, and GE P-file formats from the user's local machine to the CBFDAP. During the upload process, the application performs integrity checks, anonymization, and automatic classification of ASL types including PCASL, FAIR, PICORE, and Velocity Selective ASL [1-4]. Once the data upload is completed, the web application, which can be accessed with a generic web browser, controls all other functionalities of the CBFDAP. *Processing Pipeline*: A post processing job can be initiated on the successfully uploaded data with a list of user-specific options including field map correction [5], SENSE reconstruction [6], skull stripping, and gray matter thresholding. The web application also provides the real-time status of an ongoing job and sends an email notification to the user when the job is completed. *Data Visualization & Retrieval*: The original data (including metadata) and processed CBF maps are permanently stored in the database. The web application uses the Yahoo User Interface Library to provide the user with a quick summary of all the processed data as well as the ability to download the results to a local machine as shown by the figure above.




**Results and Conclusions:** The CBFDAP is fully functional with all the features described and is currently undergoing beta-testing by several user groups at the University of California, San Diego. To date, we have successfully processed and archived several hundred CBF datasets acquired with the FAIR and OptPCASL [7] tagging schemes for a range of subject populations (e.g. TBI, Bipolar, Depression etc.). The number of datasets is expected to grow rapidly as we begin to make the CBFDAP available to the broader research community. In conclusion, the CBFDAP provides an infrastructure for the easy upload, processing, storage, and retrieval of ASL-based CBF data. As the database grows in size and scope, we are hoping that it will serve as a resource to many investigators, allowing them to share and explore data and investigate novel scientific questions regarding CBF across a wide range of health conditions and populations. **Acknowledgement:** This work is supported by NIH 1R01MH084796.

**References: 1.** Dai et al. MRM 60:1488-97, 2008. **2.** Kim et al. MRM 37:425-35, 1997. **3.** Wong et al. MRM 39:702-8, 1998. **4.** Wong et al. MRM 55:1334-41, 2006. **5.** Funai et al. IEEE TMI 27:1484-94, 2008. **6.** Bydder et al. MRM 25:1123-9, 2007. **7.** Shin et al. 18th ISMRM (Abstract 1744).