NeuroBridge: Connecting Big Data for Reproducible Clinical Neuroscience

A National Institute on Drug Abuse funded project for data sharing, discovery and selection of Neuroscience datasets

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What is the NeuroBridge?

- A collaborative data sharing project for reuse of neuroscience data
  - Northwestern University Feinberg School of Medicine (L. Wang)
  - Georgia State University (J. Turner)
  - University of Southern California (J-L. Ambite)
  - UNC Chapel Hill (A. Rajasekar, H. Lander, H. Xu, Y. Wang)
  - Washington University (D. Marcus)
- Based on previous collaborations
  - DataBridge for Neuroscience (L. Wang, Turner, Rajasekar, Lander)
    - NSF EAGER (South BD Spoke IIS 1649397)
  - SchizConnect (L. Wang, Turner, Ambite, Marcus)
    - Midwest Big Data Hub (ACNN Spoke 1636840, 1636846, 1636893, 1636850, and 1550320)
- Funded by the NIH National Institute on Drug Abuse (NIDA)
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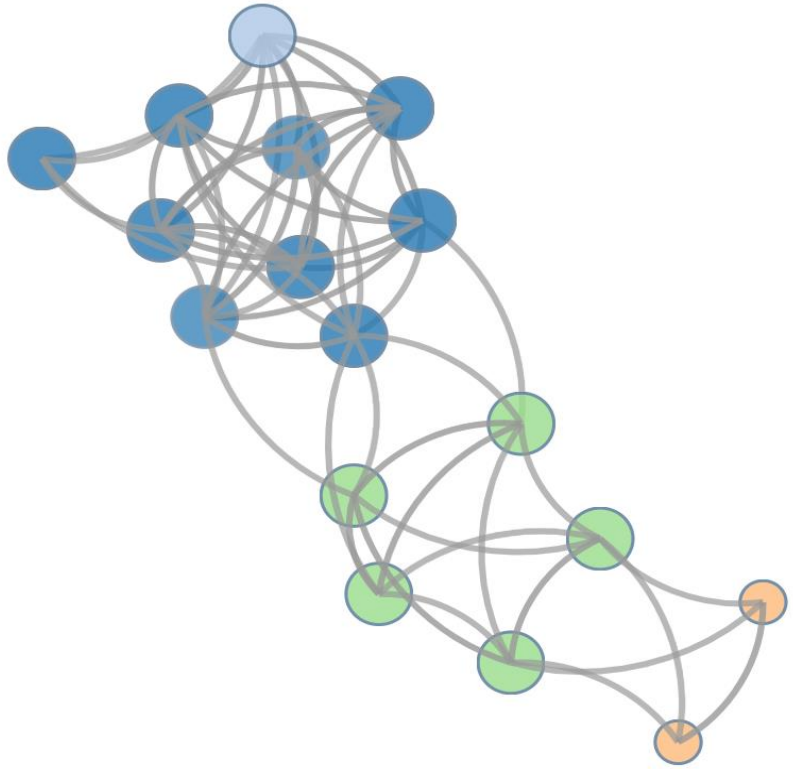
Why NeuroBridge?

The NeuroBridge will assemble metadata for a large number of neuroimaging datasets and provide scientists the ability to efficiently and accurately discover appropriate data



- Replication, mega-analysis, meta-analysis are critical in neuroimaging research
- Creating new data is expensive and time consuming; better to reuse existing data
- Different neuroimaging databases have large collections but aren't linked
- Data is often created but only used in papers and never published
- Too much data is as big a problem as too little.

NeuroBridge Architecture

Objective 1: The WebPortal will be the interface for the user to query the system

Objective 2: The Mediator will gather metadata from known neuroimaging databases, while the Miner will use machine learning techniques to extract relevant metadata from journal articles

Objective 3: The NeuroBridge DataBridge processes the system metadata in order to return suggestions of relevant datasets to the user

Objective 4: The initial use case leverages the XNAT platform to acquire metadata and data quality metrics from existing datasets