



# INI

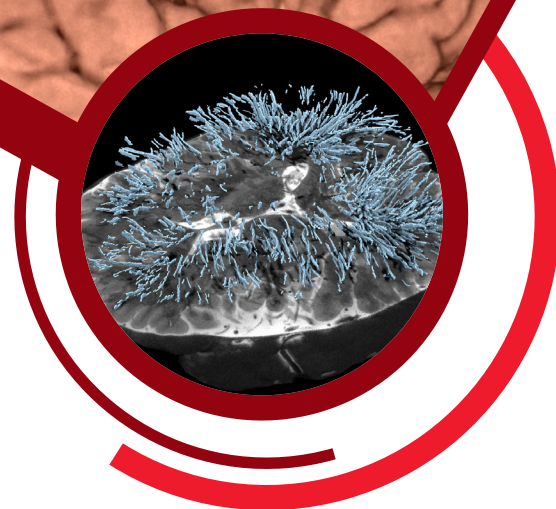
## **USC** Stevens Neuroimaging and Informatics Institute

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*Innovative Imaging & Information Technologies  
for Brain Studies*



## **Data Coordination:** *Uniting Researchers Across the Globe*



## **Data Collection**



### **IMAGE AND DATA ARCHIVE**

*The Stevens INI is one of the world's largest archives of neuroimaging data. We house the Image and Data Archive (IDA), which provides tools and resources for de-identifying, integrating, searching, visualizing, and sharing a diverse range of neuroscience data and facilitates collaborations between scientists worldwide.*



**143,000 USERS**

**89,000 SUBJECTS**

**164 PROJECTS**



**320,000,000 DOWNLOADS**



**1,480,000 UPLOADS**

## **Data Harmonization**

There are several challenges to integrating data for scientific research. Researchers across the globe collect data on diseases using various methods and different parameters and definitions in the data collection process. Methods and data types include but are not limited to: behavioral measures, blood markers, digital tracking, genetics, longitudinal data, imaging, histology, and more. The Stevens INI harmonizes data from hundreds of datasets to produce large-scale, standardized datasets of clearly defined data to support the numerous projects of our collaborators.

## **Federated Data System**

For some projects, the Stevens INI uses a federated data process, which allows multiple databases to function as one. This virtual database takes data from a range of sources and converts them all to a common model to provide a single source of data for front-end applications. Data providers from around the world can retain complete control of their data and continue to use their existing data request applications. We accommodate international privacy laws and practices while maintaining a seamless database. Unless requested, we do not store data on our server.

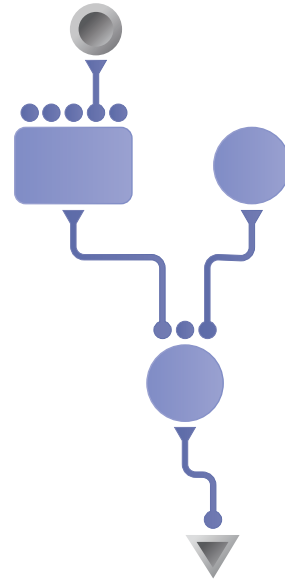
## Computational **Resources**



### LABORATORY OF NEURO IMAGING PIPELINE

The Stevens INI provides a vast number of computational resources to the greater scientific community. The LONI Pipeline is a free workflow platform to facilitate the open sharing and analysis of program-generated datasets using standardized processing/analysis pipelines. With the LONI Pipeline, users can quickly create workflows that take advantage of all the greatest tools available in neuroimaging, genomics, bioinformatics, and more. The LONI pipeline connects to the Stevens INI's grid, a massive collection of servers. Users can also submit jobs directly to the grid.

- ✓ 17K CPU hours per day
- ✓ 415K GB hours per day memory usage
- ✓ 33K average daily jobs
- ✓ 9 petabytes total data storage
- ✓ More than 4000 CPU cores



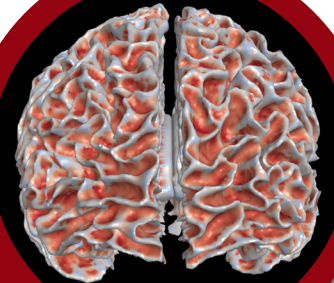
## Neuroimaging and Informatics **Computing Center (NICC)**

**3,000**-square-foot data center

**18** petabytes of data storage with **4,096** processor cores, and **38** terabytes of aggregated memory space.

The Stevens INI data center supports hundreds of local, national, and global big data investigations in the neurosciences. The facility boasts cutting-edge networking, storage, and computational capabilities to ensure data is secure yet easy for researchers to access and share.

*Rapid advances in imaging and genetics technology have enabled researchers to produce extremely high-resolution, multidimensional datasets of the brain. But the complexity of the new data requires immense computing capabilities.*



## Multicenter **Studies**



### ALZHEIMER'S DISEASE NEUROIMAGING INITIATIVE (ADNI)

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The Stevens INI manages the Informatics Core for the Alzheimer's Disease Neuroimaging Initiative (ADNI), a longitudinal multicenter study designed to develop clinical, imaging, genetic, and biochemical biomarkers for the early detection and tracking of Alzheimer's disease. Since its launch in 2014, the landmark public-private partnership has made major contributions to AD research, enabling the sharing of data between researchers around the world.



Parkinson's  
Progression  
Markers  
Initiative

### PARKINSON'S PROGRESSION MARKERS INITIATIVE (PPMI)

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The Parkinson's Progression Markers Initiative (PPMI) is a landmark study collaborating with partners around the world. The Stevens INI manages the Bioinformatics Core and Data Repository Core, which maintains the PPMI study database. PPMI aims to identify biological markers of Parkinson's risk, onset, and progression – critical tools for the development of new and better treatments – and to provide the broad research community with a comprehensive, standardized, longitudinal data set and biosample library to speed breakthroughs and enable validation toward clinical application of new findings.



### THE ENIGMA BIPOLAR DISORDER WORKING GROUP

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This collaborative effort involves more than 200 scientists, including a growing sample of 3,500 participants with bipolar disorder and 9,000 undiagnosed controls from 50 international study sites. By applying standardized data processing and analysis pipelines, ENIGMA-BD has published the largest neuroimaging studies of bipolar disorder, helping to drive consensus findings and improve the reliability of neuroimaging markers of mental illness.



<https://adni.loni.usc.edu/>

<https://dabi.loni.usc.edu/>

[https://enigma.ini.usc.edu/  
ongoing/enigma-bipolar-  
working-group/](https://enigma.ini.usc.edu/ongoing/enigma-bipolar-working-group/)

<https://gaain.org/>

<https://www.ppmi-info.org/>

<https://pipeline.loni.usc.edu/>



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