

Clviz – Clarity analysis and visualization

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Clarity

The Clarity technique allows for visualization of brain matter without damaging structural integrity. This allows for unprecedented access to connection and function estimation.

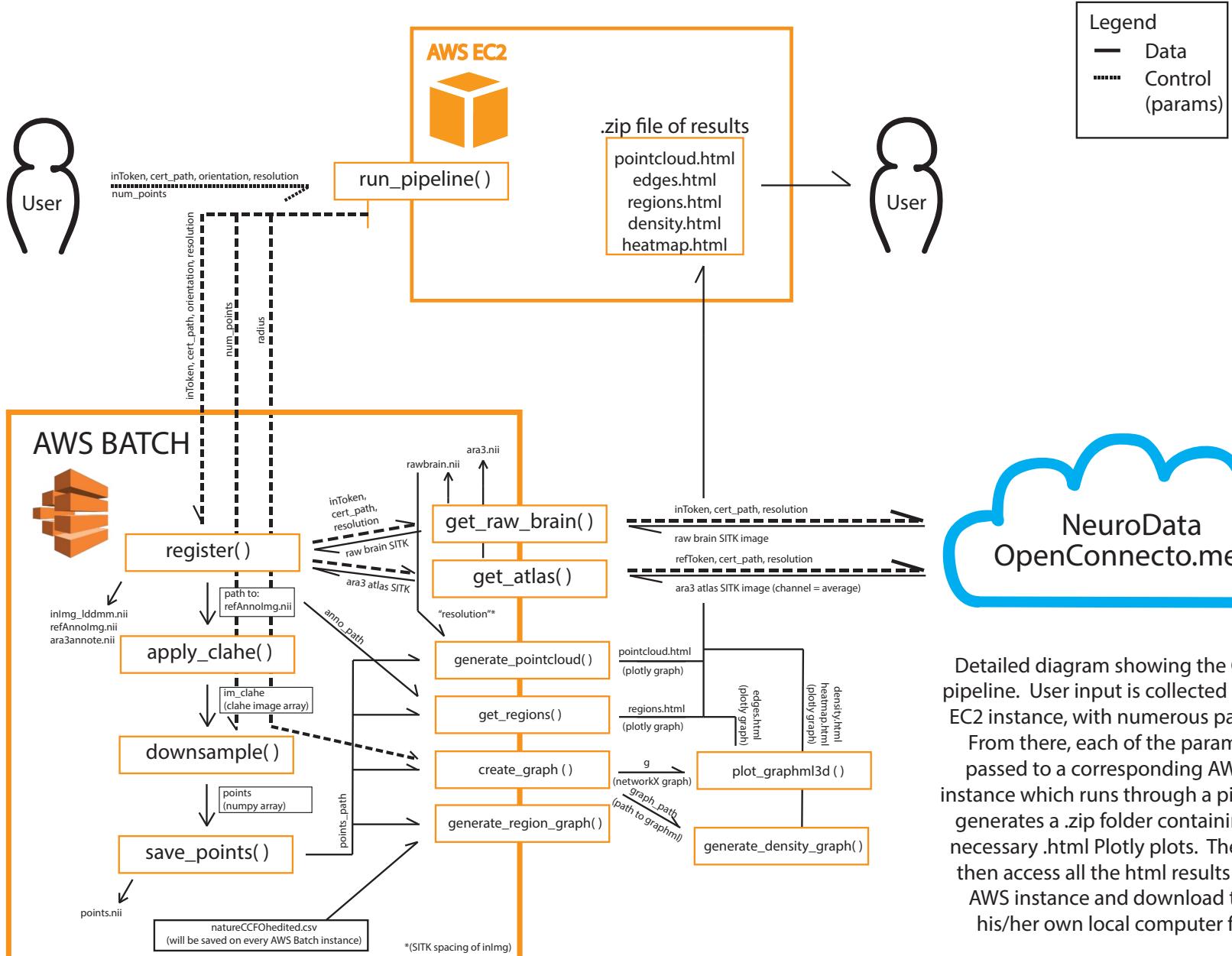
Clarity analysis is underdeveloped

Because Clarity is a relatively newer imaging technique, there is a need for the development of high quality pipelines that can easily and quickly analyze and visualize the data.

A 3 click pipeline for visualization and analysis

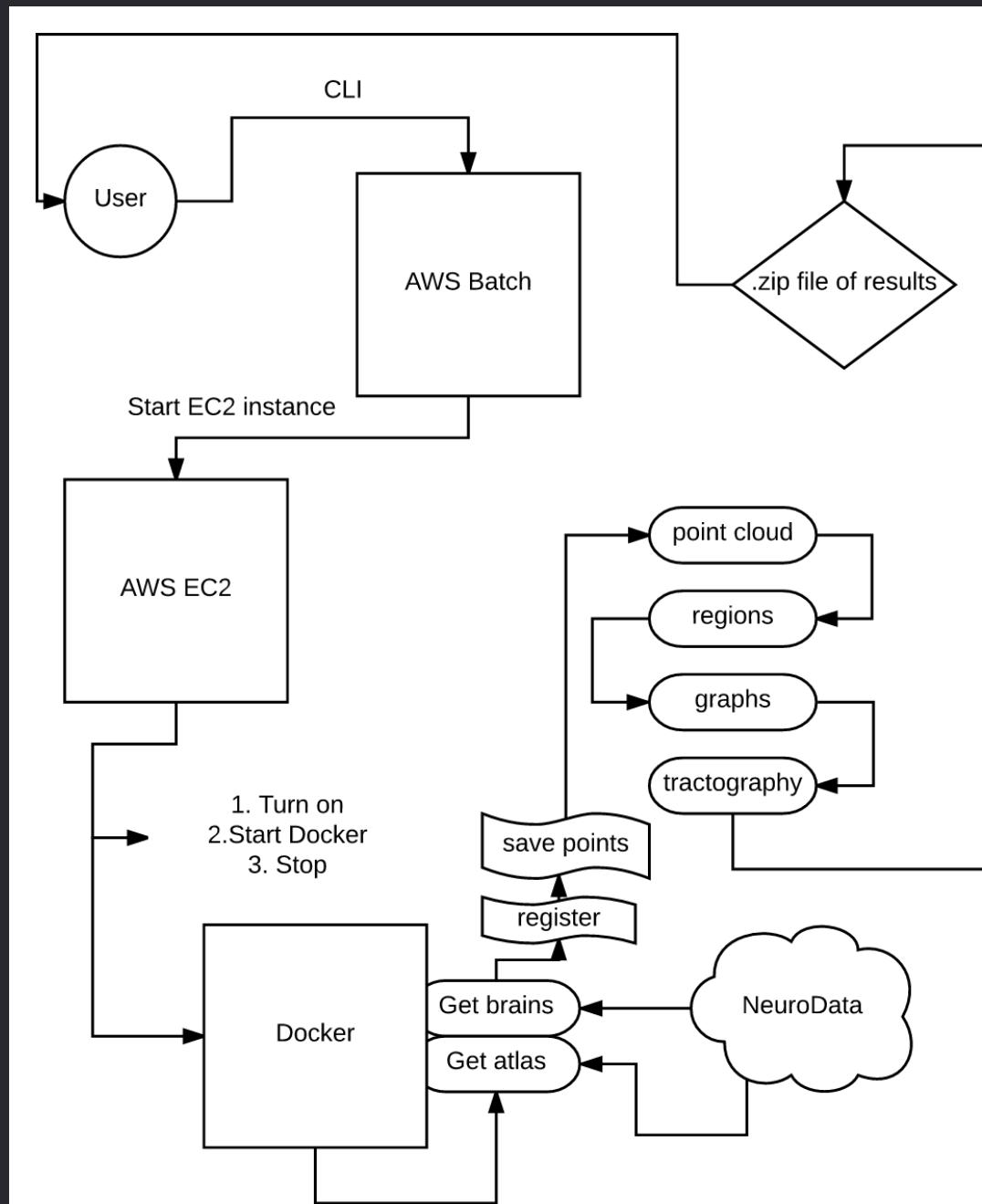
We developed an open-source visualization and analysis pipeline which is packaged to be able to be used on any modern operating system (OSX, Windows, Linux). The pipeline is implemented as a cloud-computing web service that is highly scalable.

Connectomics at Scale



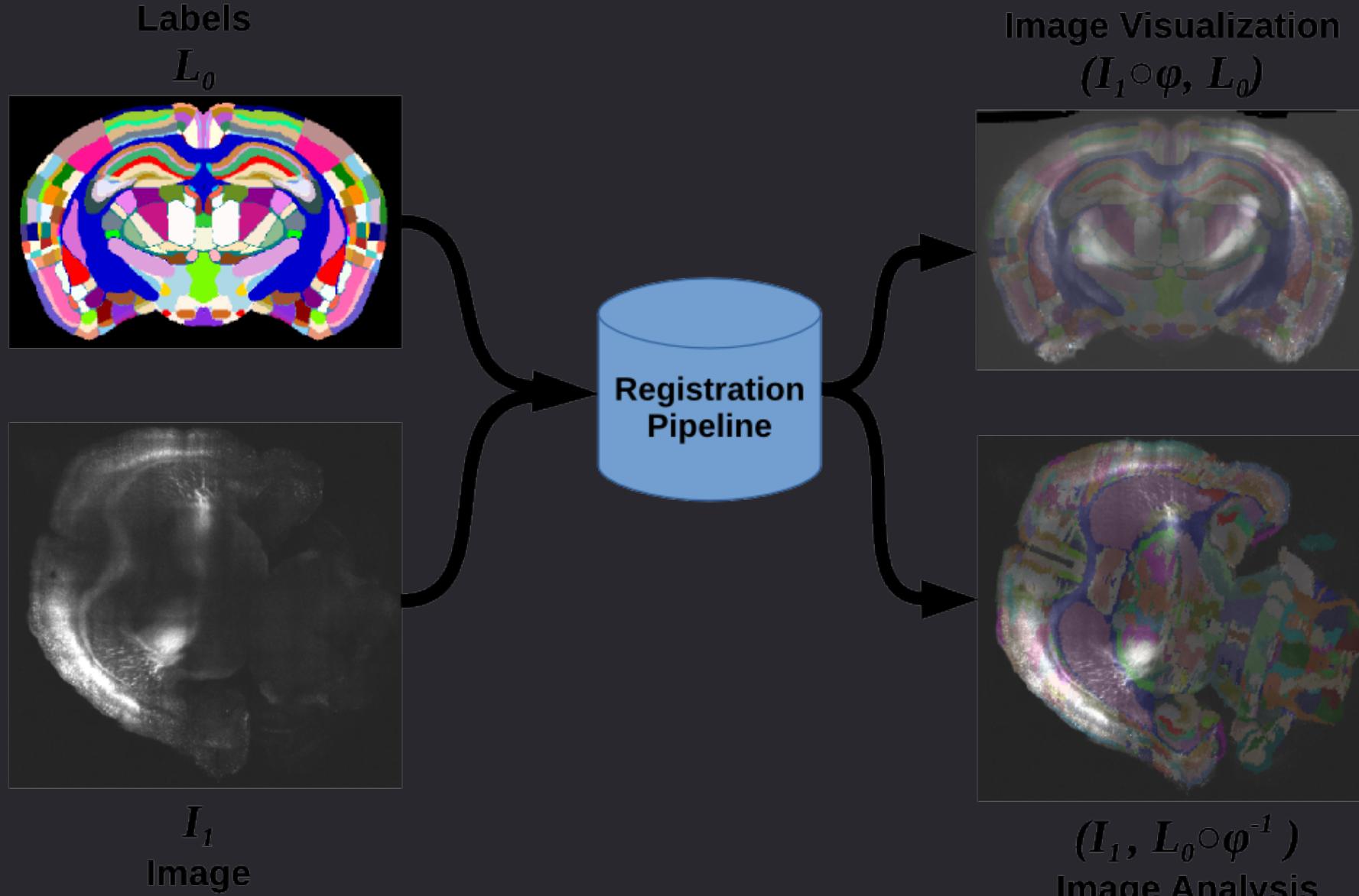
Detailed diagram showing the ClarityViz pipeline. User input is collected by an AWS EC2 instance, with numerous parameters. From there, each of the parameters is passed to a corresponding AWS Batch instance which runs through a pipeline and generates a .zip folder containing all the necessary .html Plotly plots. The user can then access all the html results from the AWS instance and download them to his/her own local computer for use.

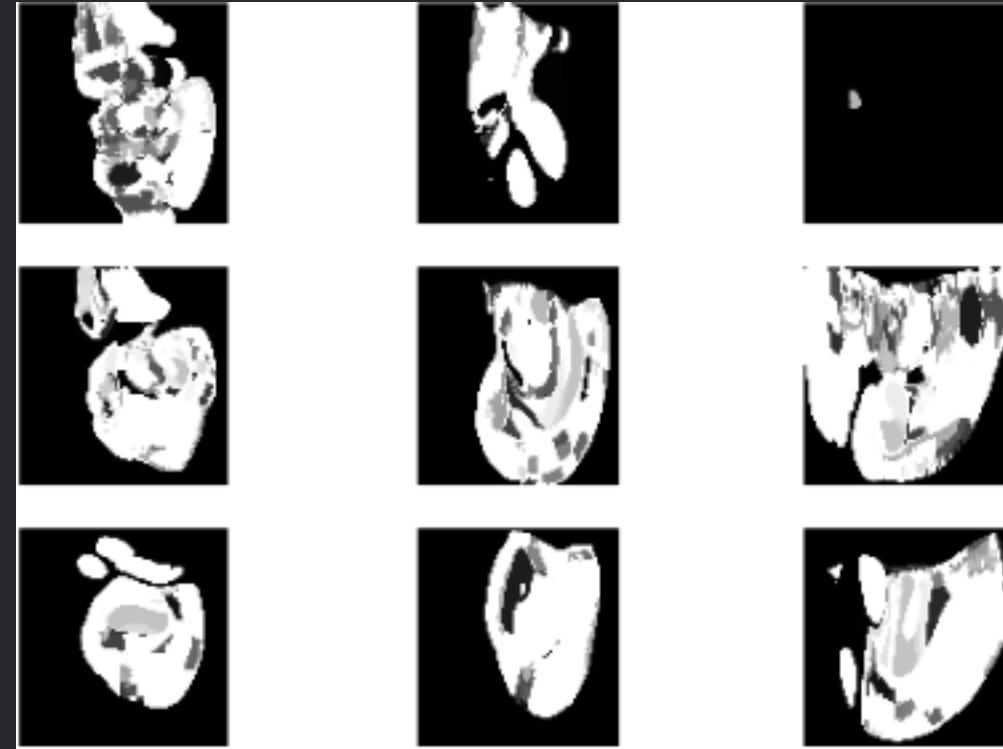
clviz pipeline



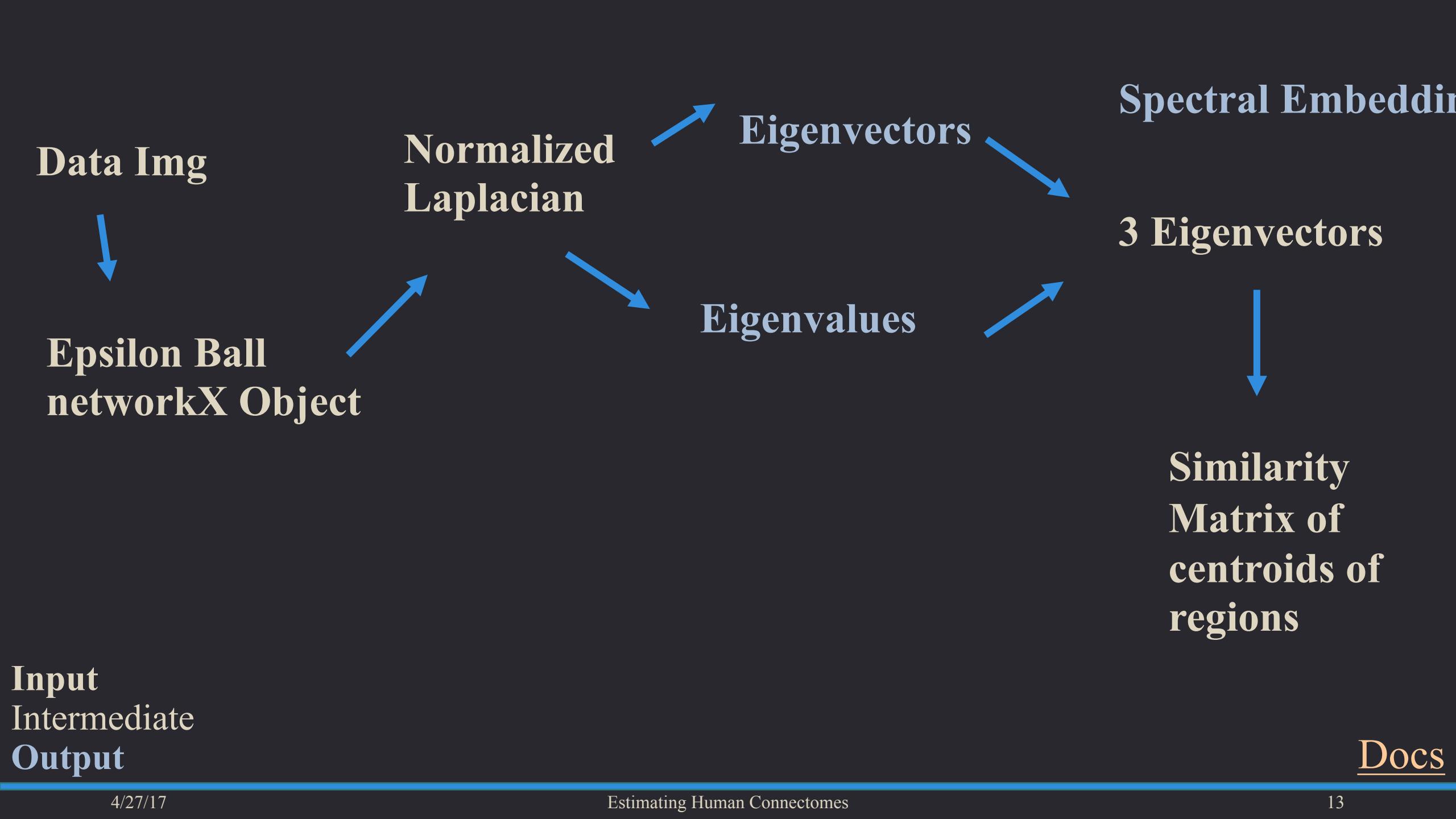
B1. Registration

**Input
Intermediate
Output**

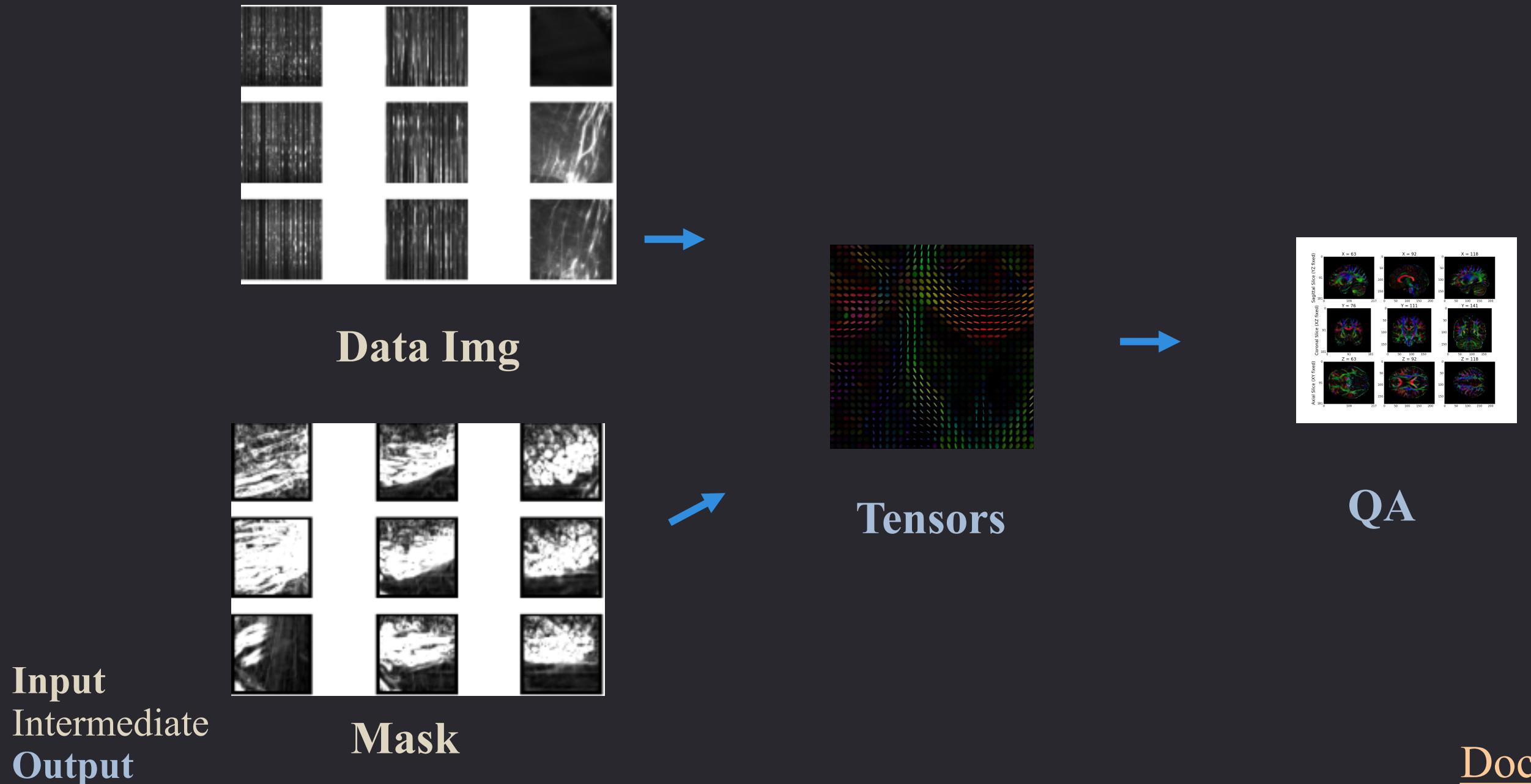


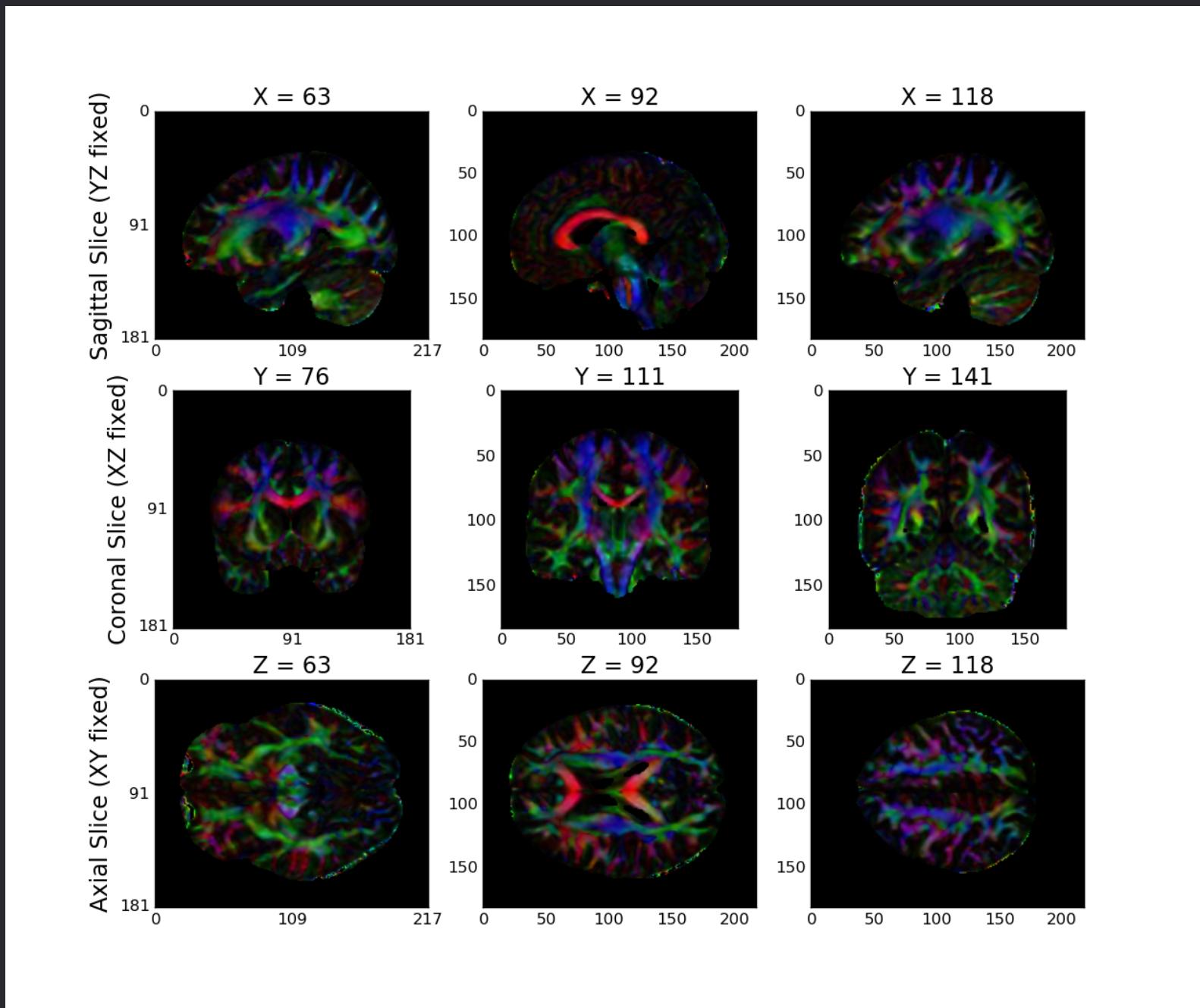


B2. Connection Estimation



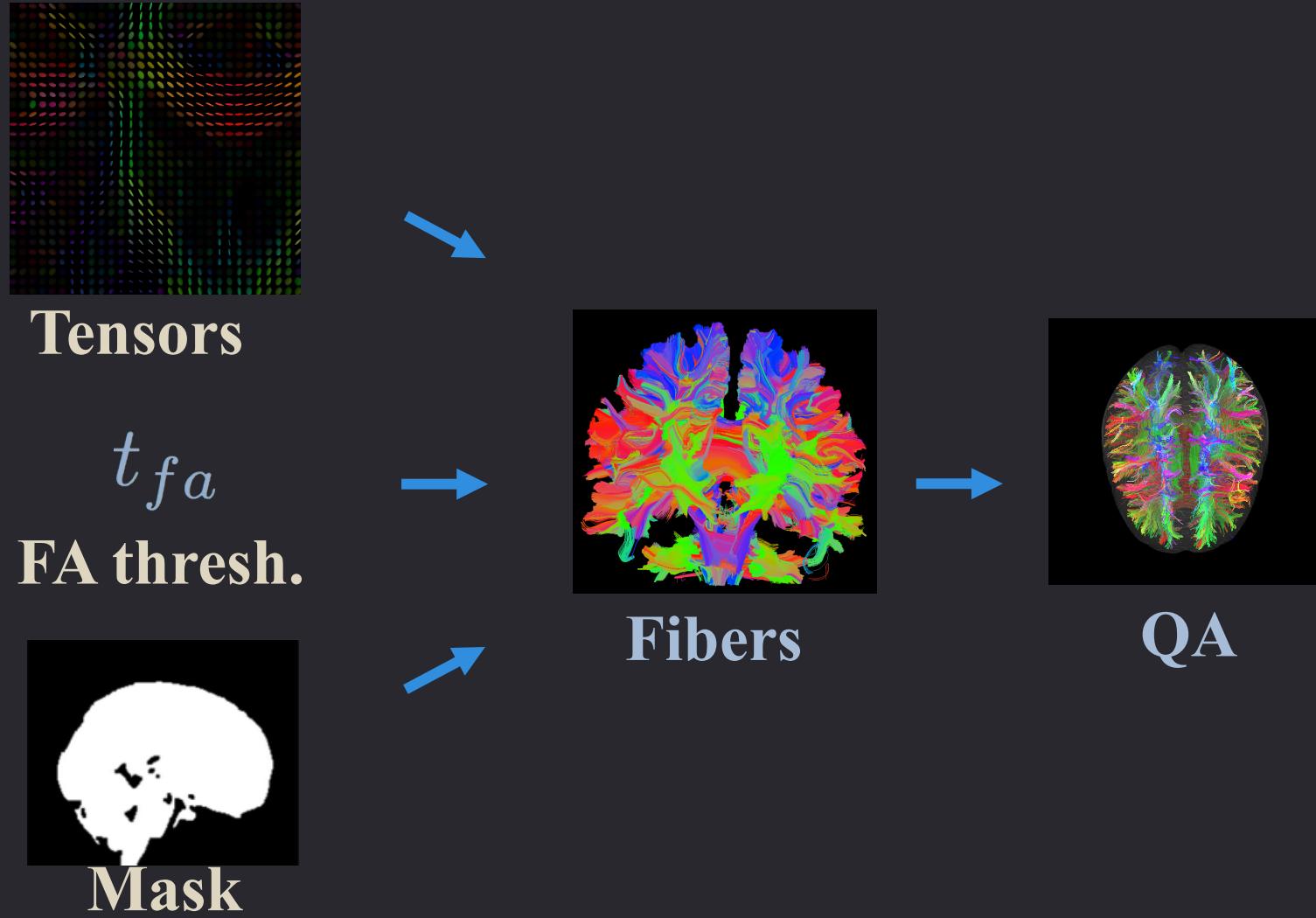
B2. Tensor Estimation



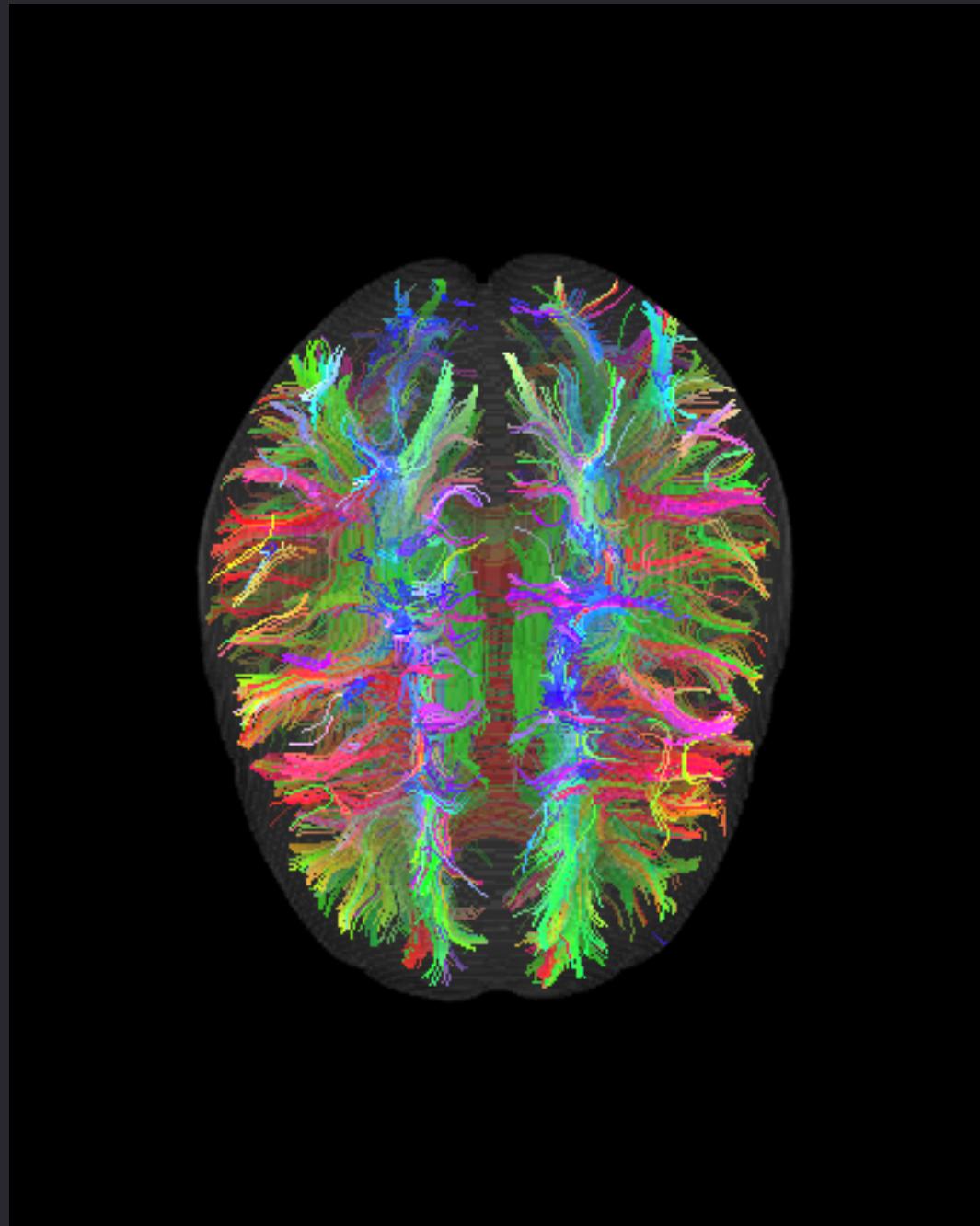


B3. Fiber Tractography

**Input
Intermediate
Output**

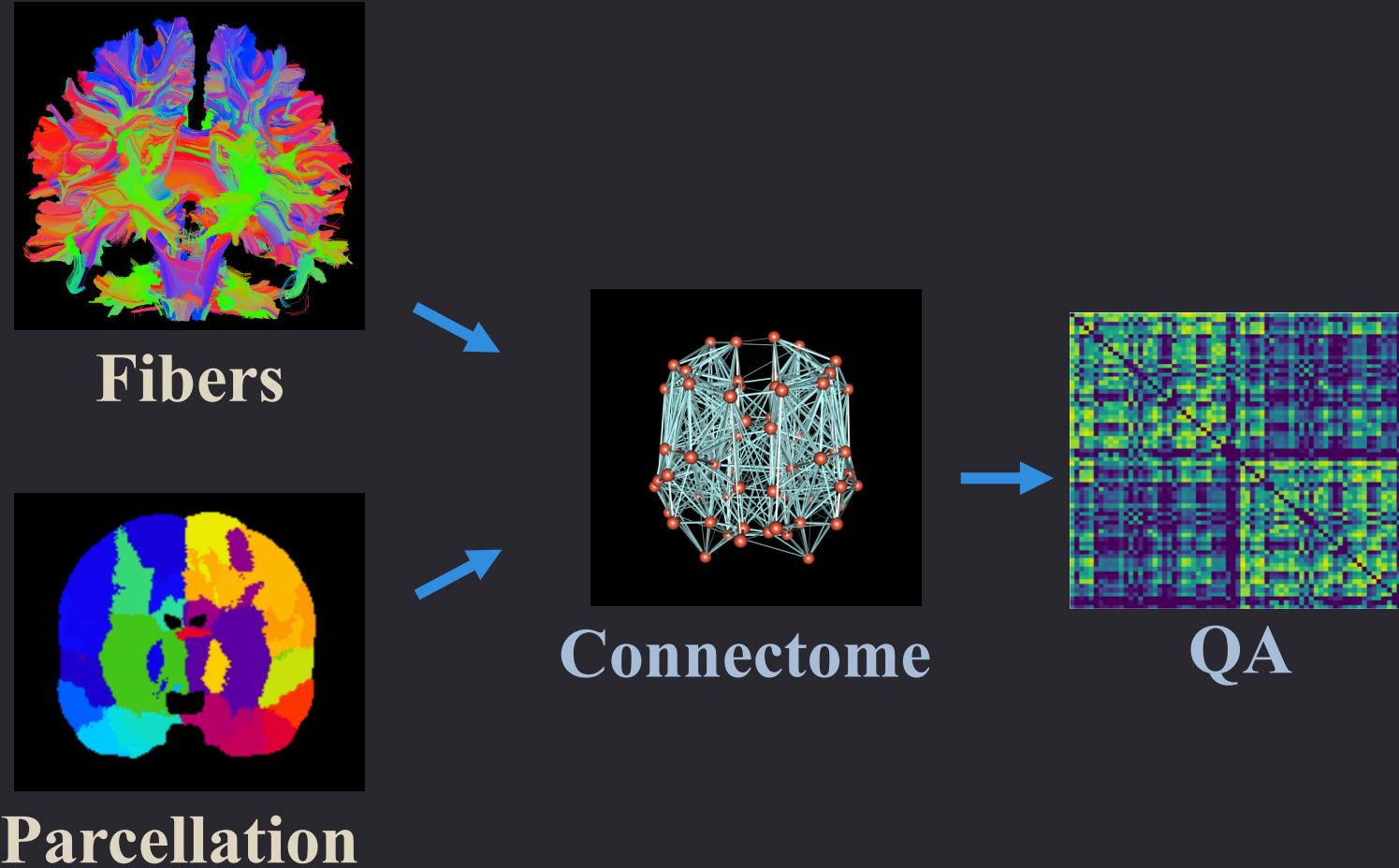


Docs

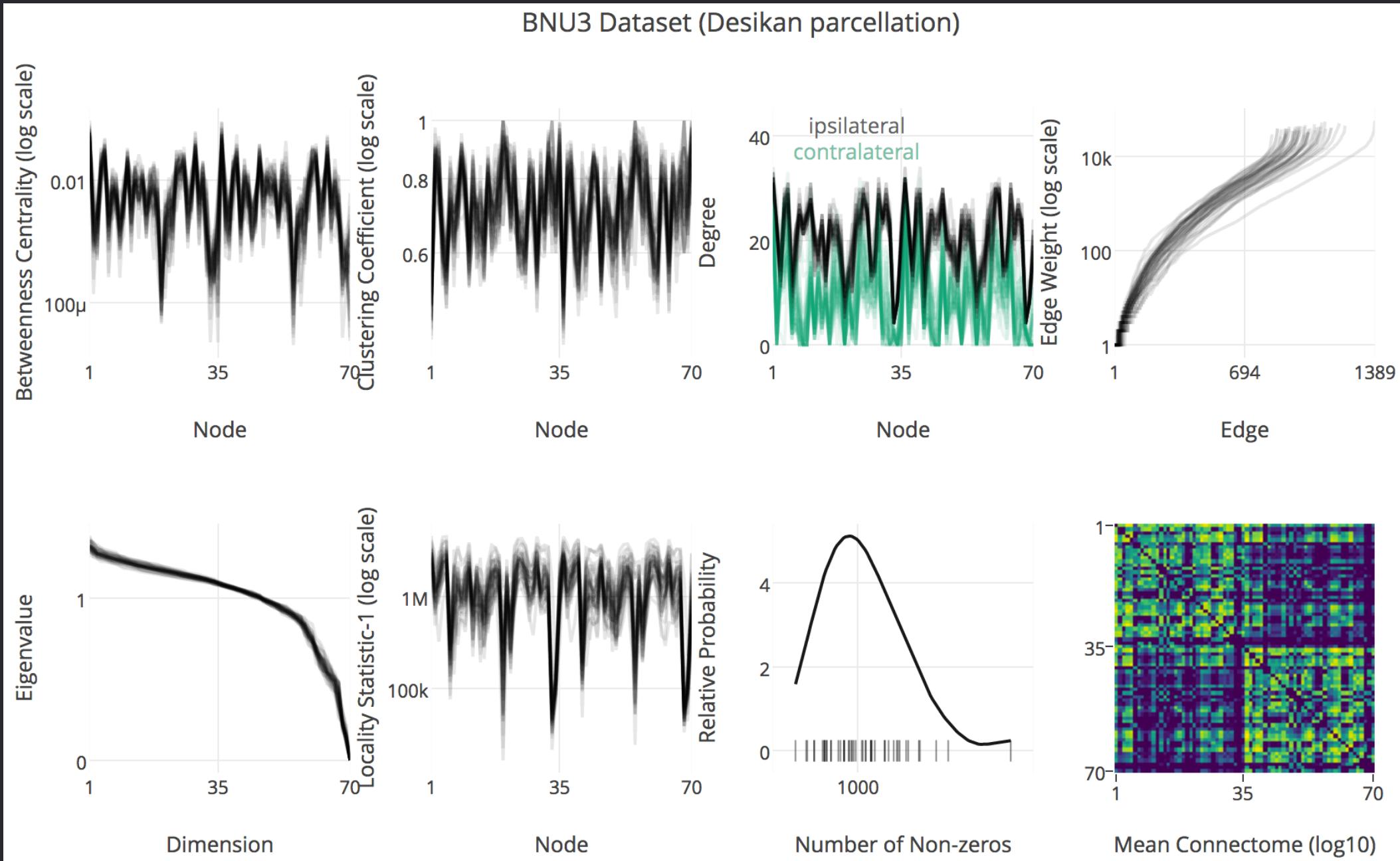


B4. Graph Estimation

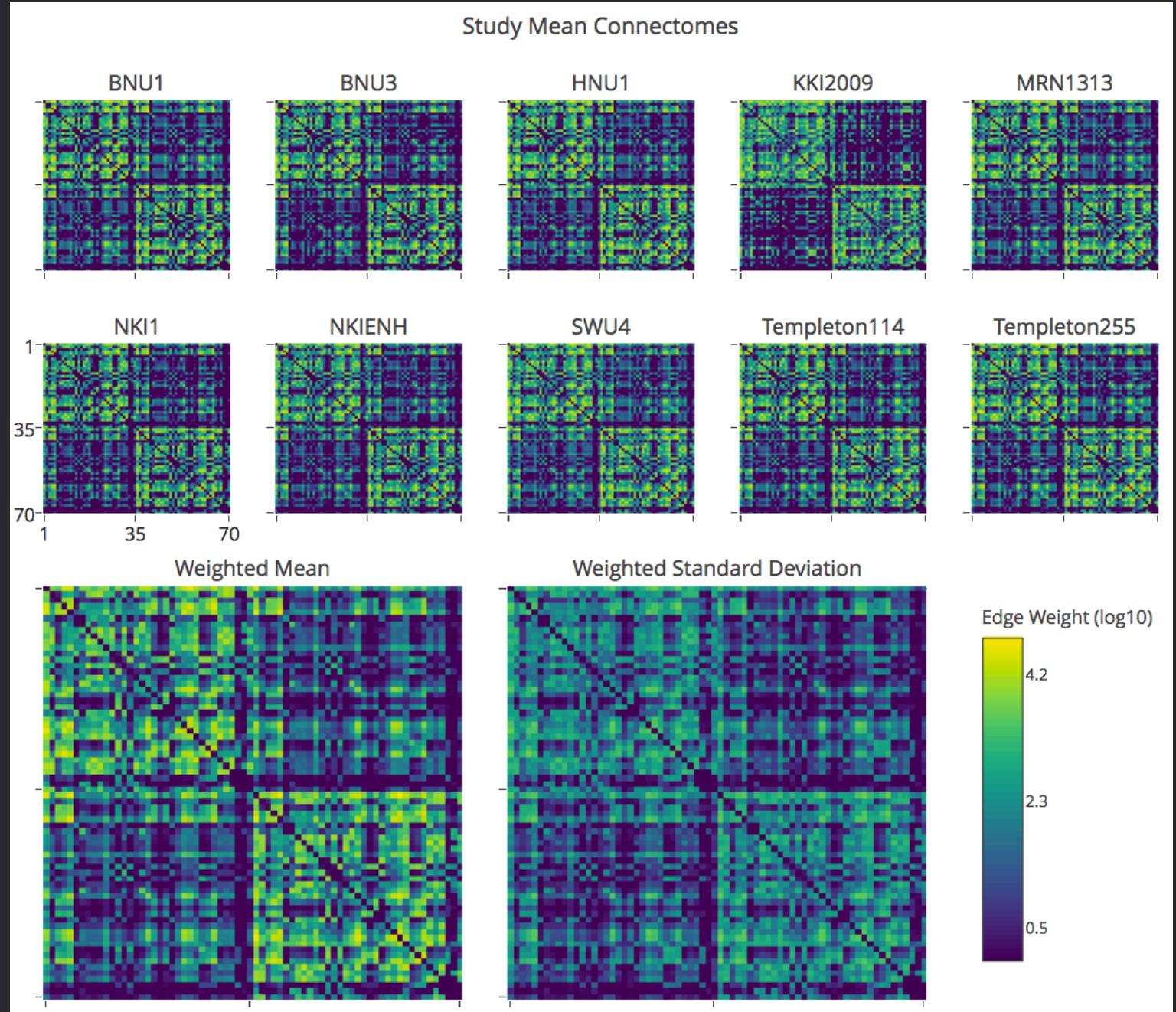
**Input
Intermediate
Output**



Docs



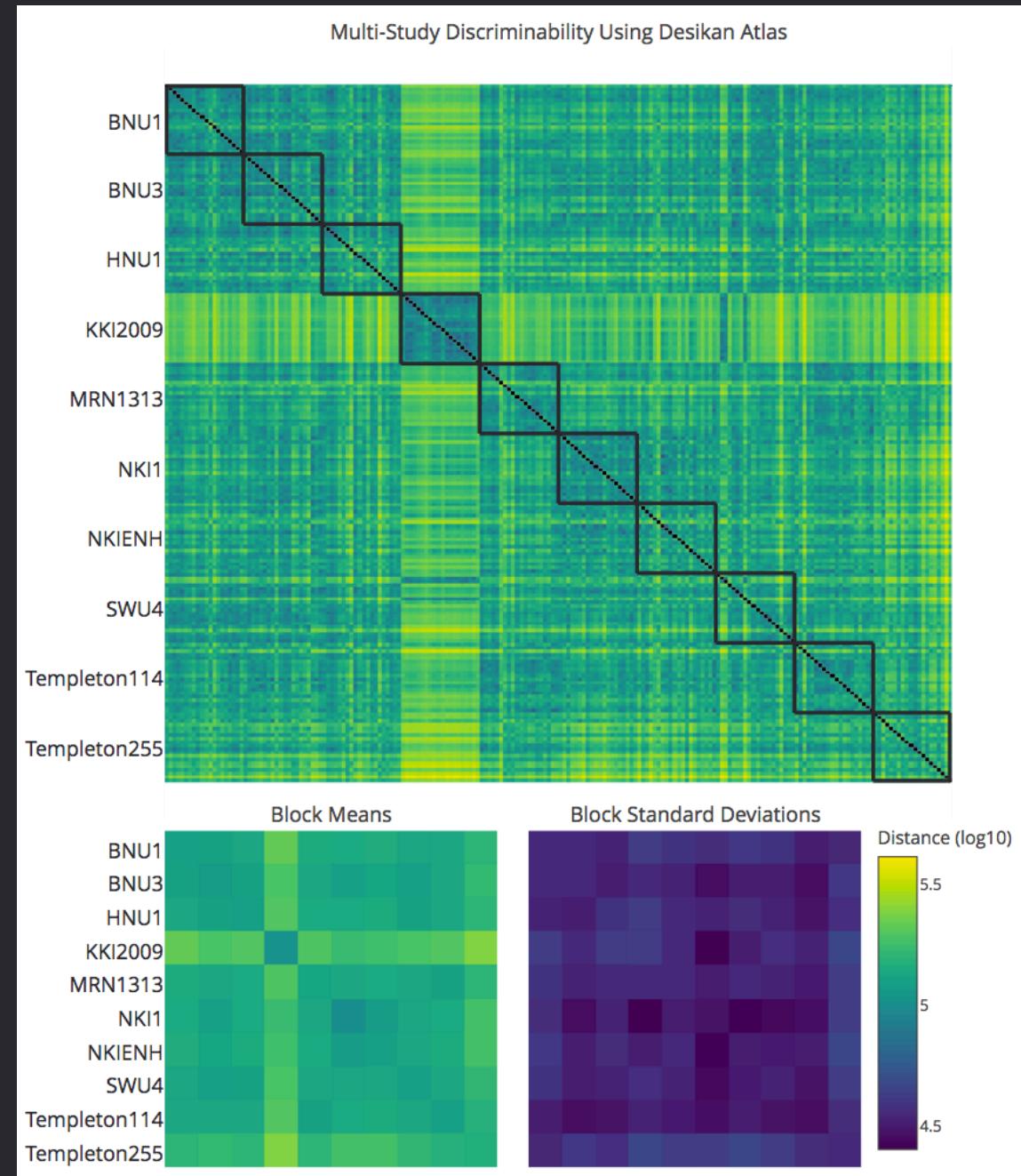
Datasets are Qualitatively Similar



Datasets are Significantly Quantitatively Different

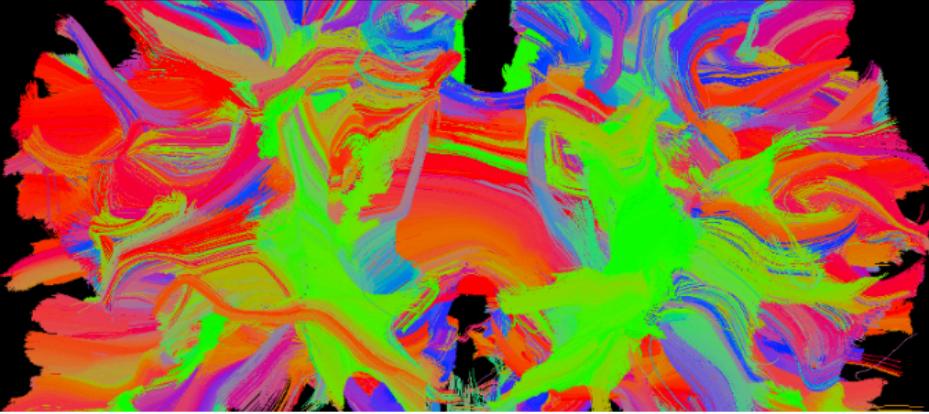
Discriminability = 0.632
(chance = 0.363)

While different datasets are qualitatively similar, they are quantitatively different



One-Click Deployment of clviz

```
ndmg_cloud participant --bucket mrneurodata --bidsdir /data/BNU1/ \  
--jobdir scratch/ --credentials ~/credentials.csv --dataset BNU1
```



A Framework for Extensible Science

Exploiting scientific containers, cloud computing, and cloud data services, we present a framework for performing and communicating scalable, reproducible, and extensible science in the cloud. We show the capability to compute massive amounts of data parallelly in the cloud, and run a web service that enables intimate interaction and demonstration with the tools and data presented. We hope this model will inspire the community to produce reproducible and, importantly, extensible results which will enable us to collectively accelerate the rate at which scientific breakthroughs are discovered, replicated, and extended.

Read our paper @ [GigaScience](#) [arXiv](#)

Try our Demo!

[Try out SIC!](#)

Running as a persistent Jupyter notebook, our demonstration walks through the ndmg pipeline and quality control.



Fork our Code

Download either the frozen-for-publication or up-to-date versions of our code and try sic yourself!

- [GigaDB archive](#)
- [GitHub](#)



Use the Cloud

Our pipeline is integrated with a variety of platforms, and has been used to process a variety of datasets in the cloud. We encourage you to pull on one of these threads.

[Processing Data](#)



Authors

Kiar, G; Gorgolewski, K, J; Kleissas, D; Gray Roncal, W; Litt, B; Wandell, B; Poldrack, R A; Wiener, M; Vogelstein, R J; Burns, R; Vogelstein, J T

Demo

In Progress



Thank you!

Qs?