Brain Mapping for Brain Disorders

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Brain disorders: traumatic injury, mental disorder, neurodegenerative diseases

One billion people worldwide suffer from brain disorders

No cure for most brain disorders

Some caused by physical injury, some caused by mental conditions

Is there a difference in neural connections between people that suffer physical vs. mental trauma?
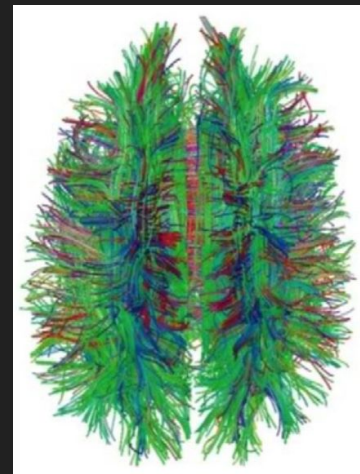
Question

Our Experiment

- Acquire brain samples, about 200 brains of veterans that suffered from chronic PTSD as well as athletes that had a history of concussions/CTE
- Use an EM scanner (ZEISS MULTISEM 505/506) to scan various parts of the hippocampus as well as the prefrontal cortex.
- Use this data to generate brain graphs, examine locations where there is a lack of neural connections.
- Store data on a server and host it on a website.

Processes

- Software to collect visual data automatically from the microscopes
- Open Source the information extraction software
- Clustering algorithms to determine the specific part of the brain, and then graph extraction algorithms to fit the need of what we are surveying.
- Use AWS for all of our data storage needs, with a layer on top to specialize for visualizations that we need
- Use this data for a hosted website to open source the data

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