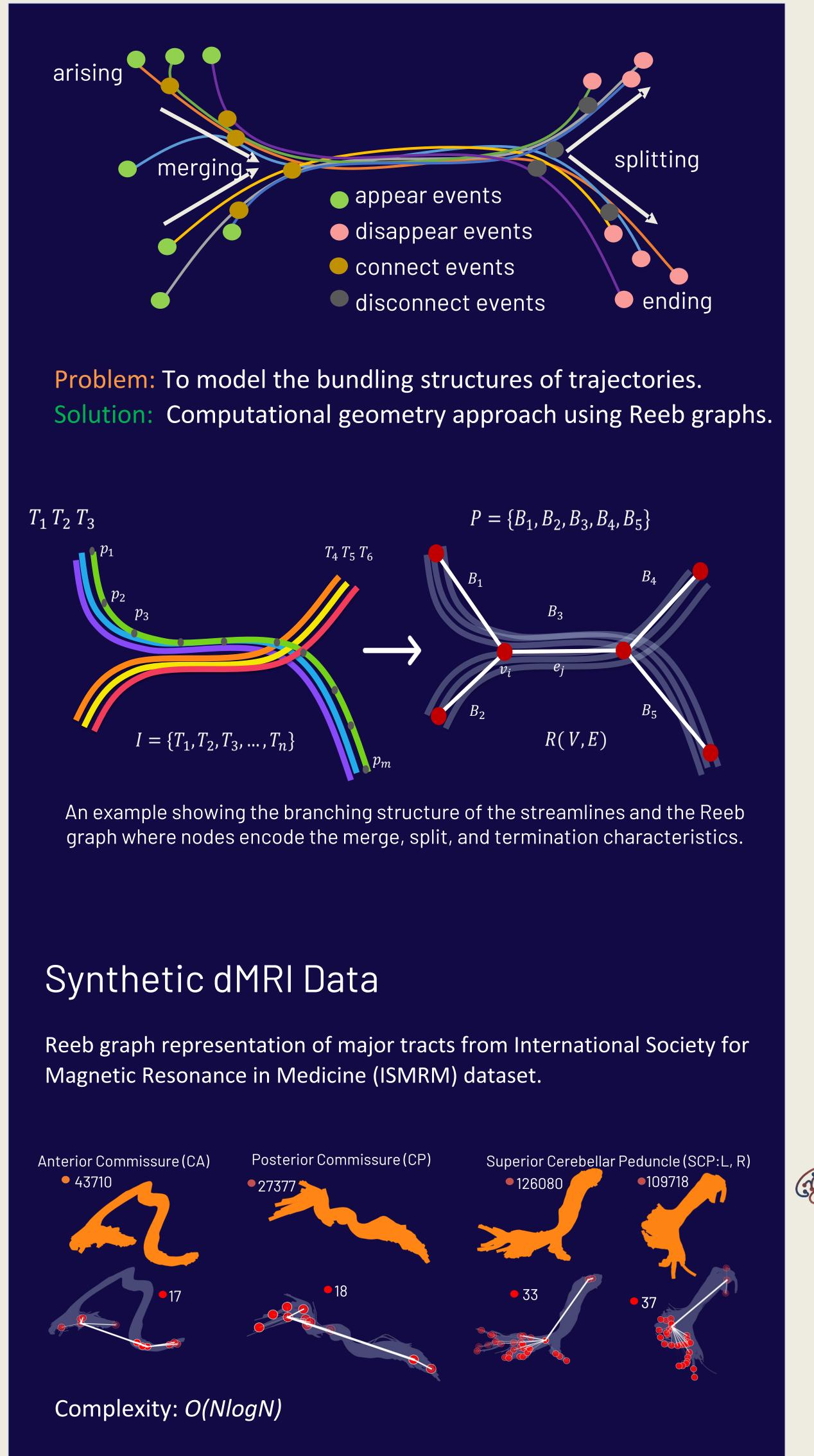
Topological characterizations of spatial trajectories for neuroscience and beyond

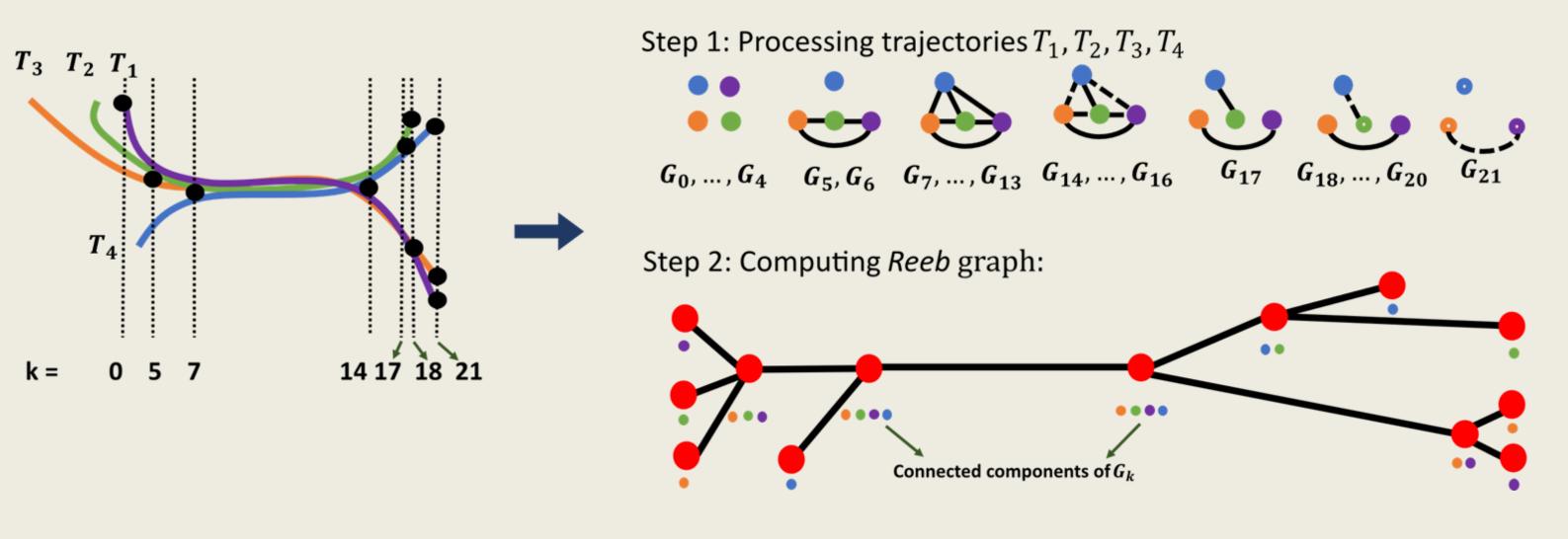
A Reeb graph-based approach discovers the branch and merge structure of the streamlines that unravels a topological understanding of spatial trajectories.

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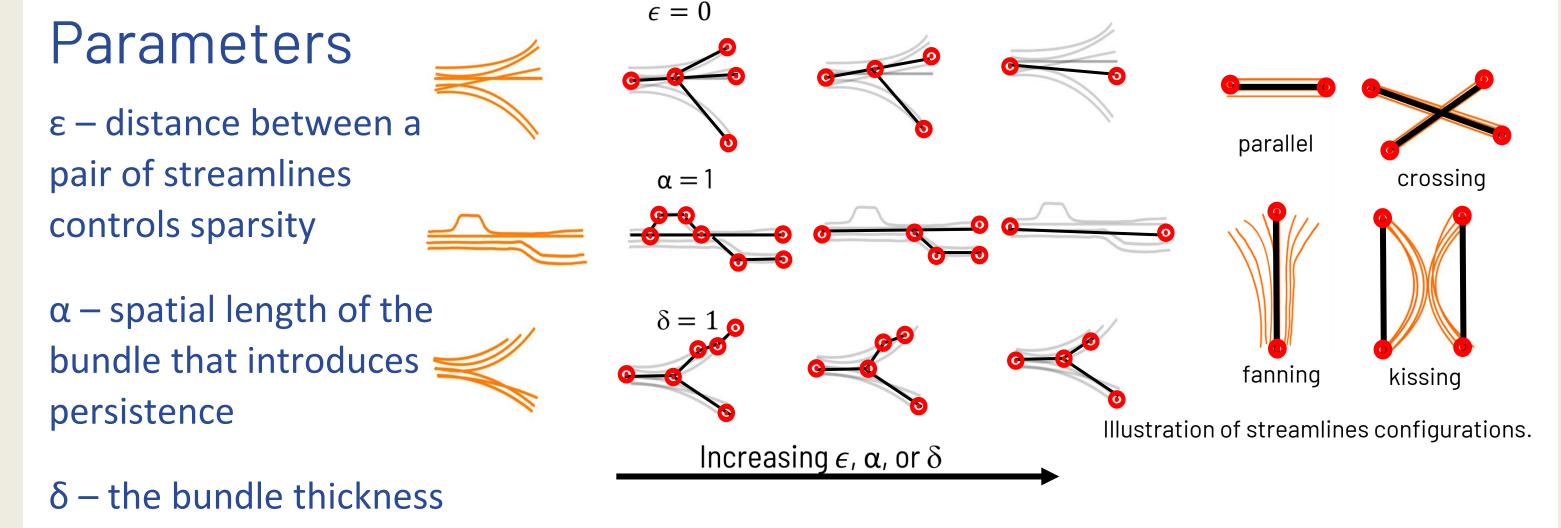
I. Trajectory Grouping Problem



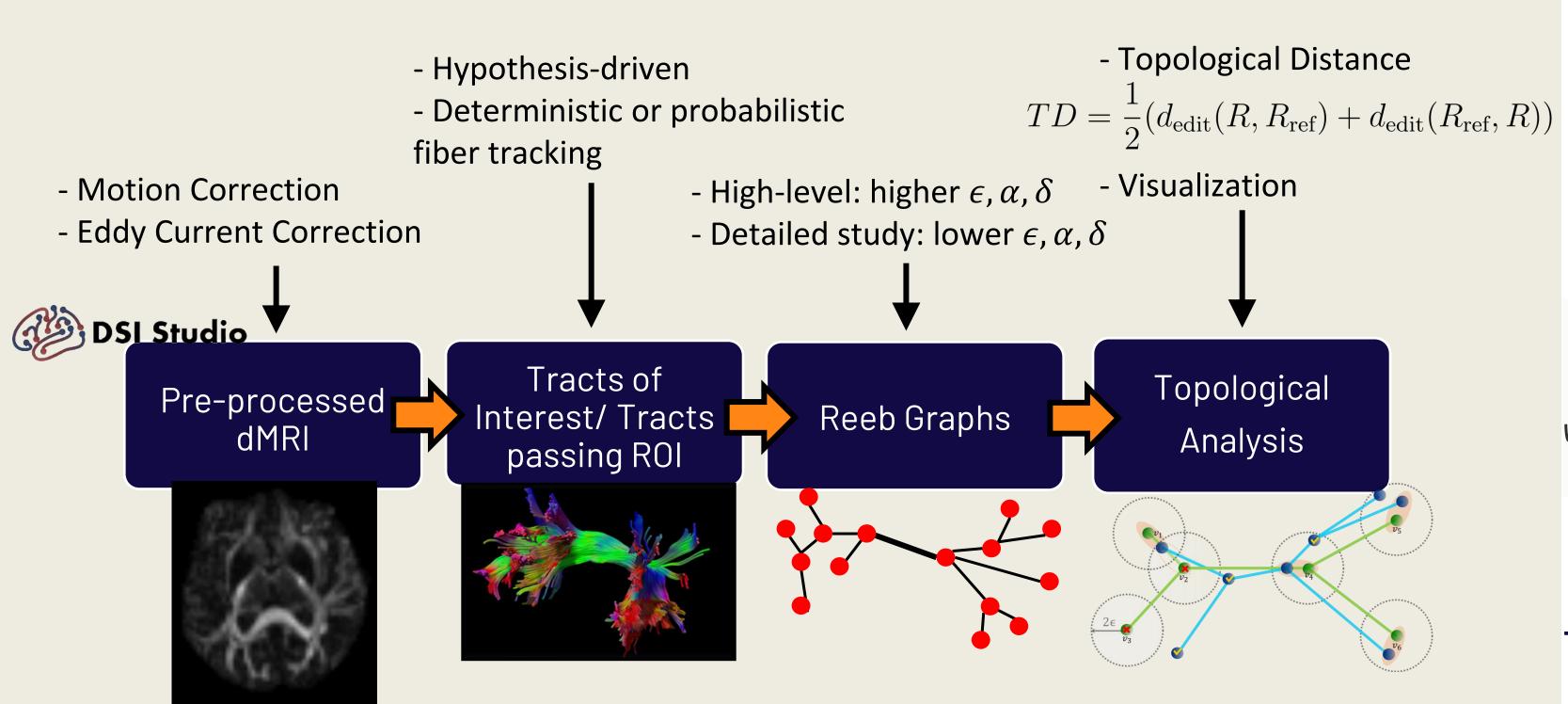
II. Reeb Graph Algorithm



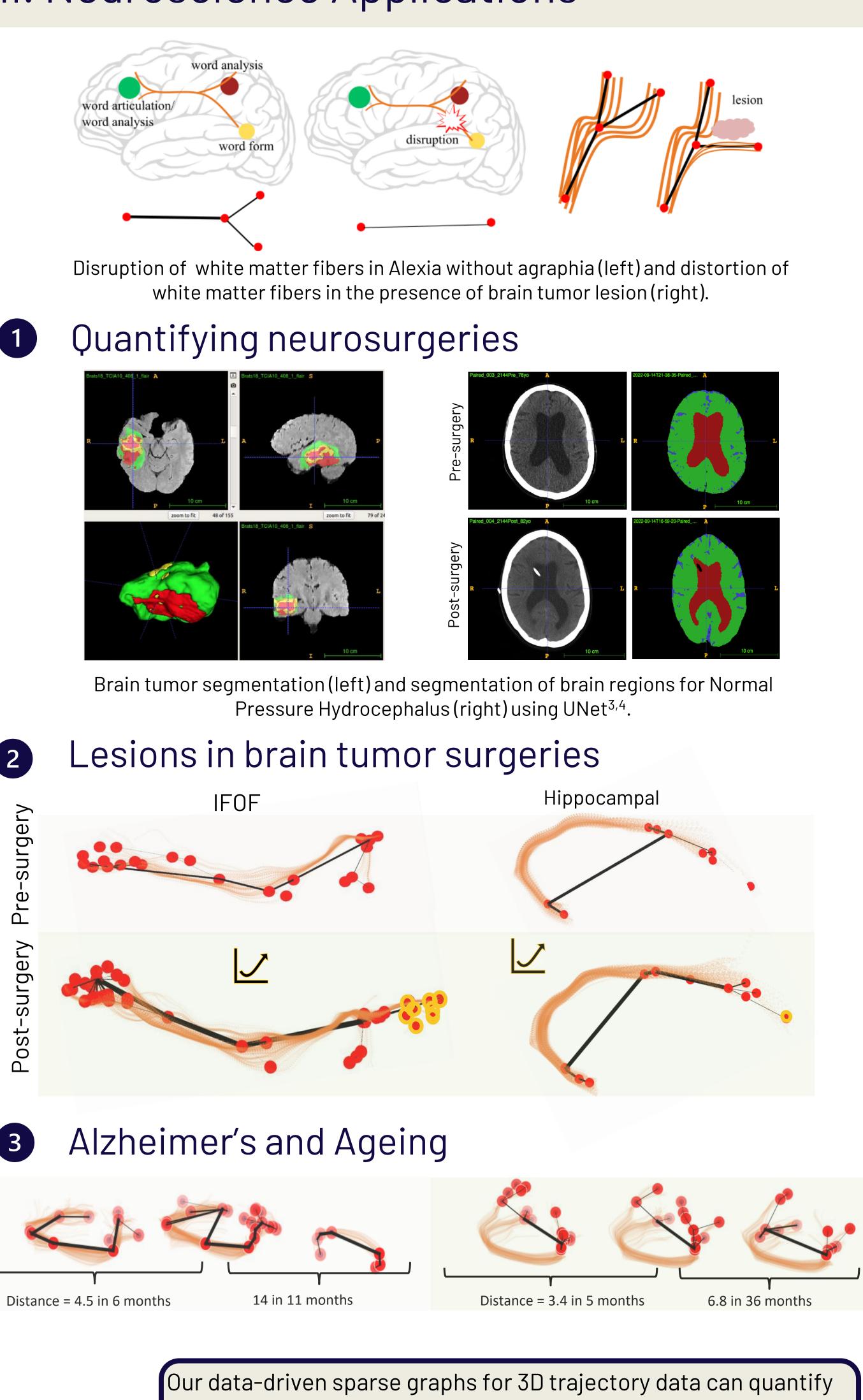
Key idea: If a continuous portion of a set of fibers are "close", they share a common anatomical behavior.



ReeBundle Pipeline



III. Neuroscience Applications



Takeaway

neurological disorders in the brain. The method is generalizable to other datasets and scalable to millions of trajectories.

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[4] Kao PY, Shailja S., et al. Improving patch-based convolutional neural networks for MRI brain tumor segmentation by leveraging location information. Frontiers in neuroscience. 2020:1449.