

## TOWARD INTERACTIVE VISUALIZATION OF CONNECTOME PATHS

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Scientists have worked for generations to understand neuronal communications between cells in the brain and eye, but imaging technology is just now approaching the point where reverse engineering these connections is feasible. Gaining an intimate understanding of cellular connections is important because most neurologic diseases are caused by abnormal cell-to-cell communications, but reasoning about these pathways is very challenging. In typical samples of retinal tissue, there are hundreds of thousands of cells, millions of connections and hundreds of paths connecting any two cells, making it difficult to identify dominant neuronal pathways. Ambiguity in the scientific labeling of cells' communications compounds this problem and is difficult to overcome through traditional computational techniques. Visualization is essential to understanding this problem because the complexity and ambiguity in the data necessitates a human component, not only for finding important trends in the data, but also for identifying new research questions and correcting mislabeled data. Developing a visualization tool to effectively visualize and analyze the pathways between cells in the retina would greatly help researchers grappling with these data and minimize misconceptions about the data by allowing researchers to dynamically verify their hypotheses, reducing the time necessary to understand neurologic diseases. This tool will allow researchers to find salient paths between types of cells, search for paths meeting a certain criteria, and ultimately identify major neuronal pathways in the eye.

