Problem Statement and Goals
LiveNeuro

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Table 1: Revision History

Date	Developer(s)	Change
January 20 2025	Bo Liang	Initial Draft

1 Problem Statement

Neuron data based on human brain activity is often complex and multi-sourced. To clearly represent such data, it is common to use multiple data plots for visualization. However, due to the differing coordinate dimensions of various data sets, it becomes challenging for users to track specific data points across multiple plots at a given time and to comprehend the complete data transformation process. This hinders the understanding of the overall process.

1.1 Problem

This project aims to develop an interactive data visualization method that links multiple data plots together.

1.2 Inputs and Outputs

1.2.1 input

acoustic stimuli, physical brain structure

1.2.2 output

Generate an interactive data plot that combines high-dimensional neuronal electrical signal data with the actual physical brain structure model, using the dipole moment as the main information.

1.3 Stakeholders

Stakeholders include researchers, scholars, and students who aim to gain a clear understanding of the complete neuron stimulation process.

1.4 Environment

The project will be developed in Python 3.11 on Windows,macOS and Linux.

2 Goals

1. Enable user interaction with data plots, allowing users to freely view specific data at any position on the plots.
2. Implement linkage between different data plots and support user interaction.

3 Stretch Goals

Allow flexible configuration of different types of data, enabling customizable and dynamic linkages.

4 Challenge Level and Extras

This project poses a general level of challenge. While it is not a research-oriented project, it requires a certain level of understanding of neuroscience-related data models, extensive software development experience, and the ability to iterate based on user feedback and habits to ensure an optimal user experience.