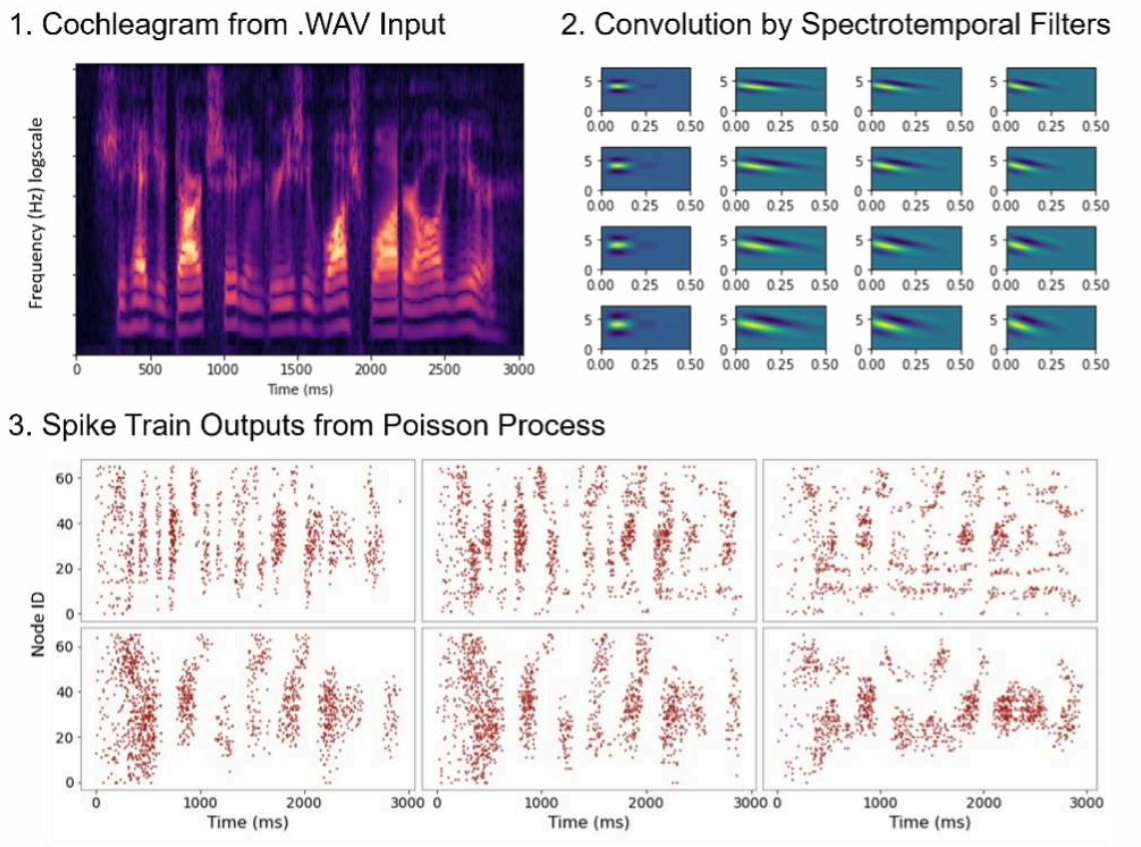
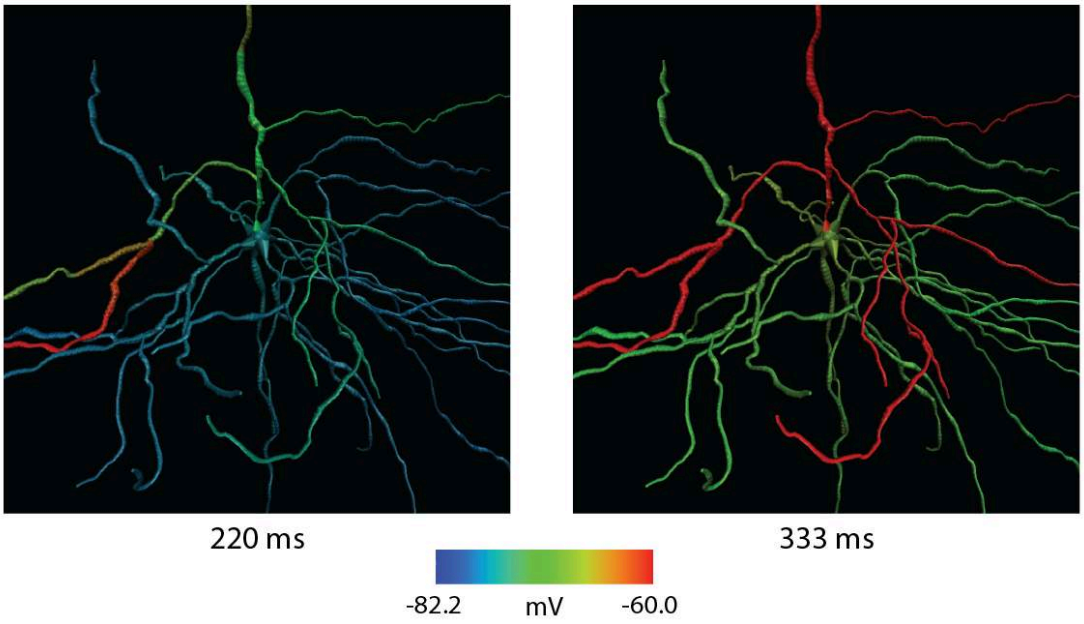
April 2024
Modeling Software Updates

BMTK's FilterNet extended to auditory processing



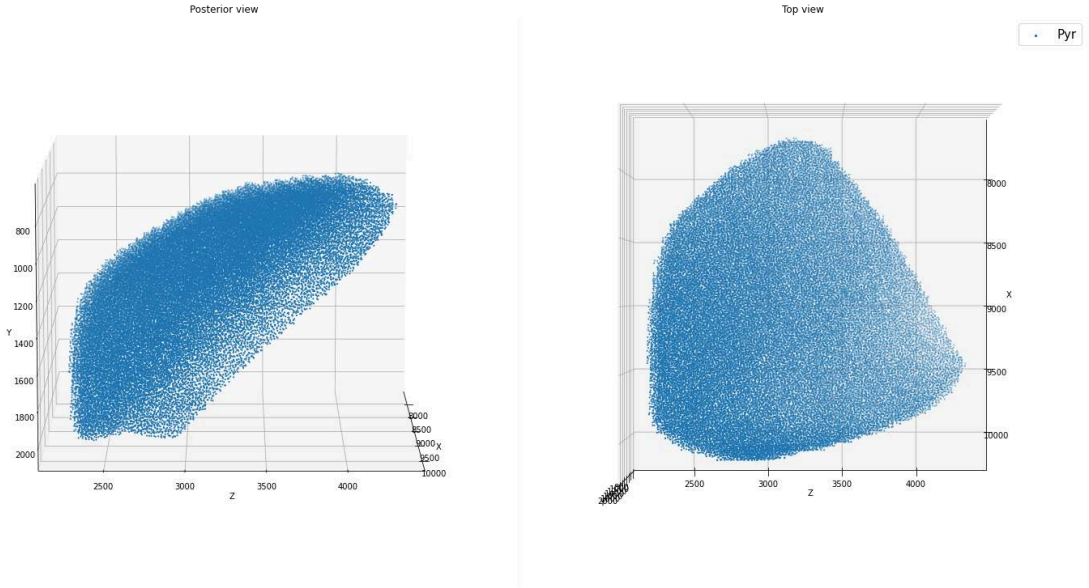
Auditory FilterNet extends BMTK□s integrated modeling pipeline to auditory processing. This module allows users to convert .WAV files into auditory-driven spike trains through a series of customizable transformations that mimic processing in the early auditory system. The implementation follows that of the existing Visual FilterNet and will be intuitively accessible for current users, ensuring a straightforward integration process for auditory data into new or existing computational models.
Explore the tutorial here ►

Compartment time-series animation in VND



VND visualization software offers animated visualization of per-compartment neuron time-series data such as propagation of voltage and Ca^{2+} concentration through the body of a cell, dynamically coloring each compartment with user-specified color scales and ranges.

Realistic cell body placement from anatomical NRRD files



In addition to standard geometries, BMTK users can obtain realistic placement of cells using structural data e.g., in the Allen Brain Atlas Common Coordinate Framework, or using a user-defined custom density raster in the NRRD format. Minimum distance between somata can also be enforced.

Advanced simulations of extracellular electrical stimulation

BMTK can now utilize COMSOL Multiphysics software files containing electric fields with complex geometry and dynamics as inputs to simulations of electrical stimulation of neurons and neuronal networks.

VND ruler and scale overlays

New ruler and scale overlays in VND help keep you oriented while zooming around large model systems. Dynamically changing box grids, side rulers, and traditional bar scales provide a continuous sense of relative size from a complete system down to details of individual cells.

Model hierarchy tree and per-selection neuron counts in VND
Multiple VND features help provide intuitive understanding of the model system and representations. A clickable tree view of model hierarchy displays the organization of the loaded model: files, populations, and groups. When search queries are used to create graphical representations, the number of neurons in each representation is displayed.

Please contact education@alleninstitute.org with any questions.

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