

State Space Phase Estimation

A tool for real-time estimation of phase using data-driven estimation of brain rhythms.

- **Current methods for real-time phase estimation rely on bandpass filtering. We use a Kalman filtering approach instead to do sample by sample phase estimation.**
- **We use a data-driven approach to estimate rhythms present in the data and separately estimate signal (rhythms) and noise.**
- **Our method estimates credible intervals for the phase, allowing assessment of confidence in the phase estimates.**
- **We have deployed the tool as a ready-to-use plug-in for the OpenEphys acquisition system (at <https://github.com/tne-lab/phase-calculator>), making it widely available for use in experiments.**
- **We also provide a MATLAB implementation of the tool for re-use and further development at <https://github.com/wodeyara/stateSpacePhasePredictor>**