

Updates on OpenEP: The Open-Source Platform for Electrophysiological Data Analysis

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Introduction. OpenEP (<https://openep.io>) is an open-source library for electrophysiological data analysis first released in 2020. This paper provides an update on the features and tools added since initial release.

Method. Software development has been performed in Matlab (R2020a/R2021b), Visual Studio and Python3 with a Py-QT front-end.

Result: Development is ongoing in data parsing, analysis, and a graphical interface.

Data parsing. We continue to update and support the parsers for Carto3, Velocity and Precision. In addition, we have added a parser for the Kodex mapping system (Figure 1A).

Data analysis. We have added an extensible architecture for data interpolation. This new architecture has uncovered hitherto unrecognized variation in interpolation schemes in clinical mapping systems and will permit the optimization of interpolation methods against 'gold standard' simulation or histological data. Similarly, an architecture for conduction velocity/vector measurement is under development (Figure 1C). We have refined the ablation lesion quantification tools permitting time-domain analysis of lesion formation (Figure 1B).

Graphical interface. We are developing a graphical interface, providing the ability to visualize, manipulate and analyze electrophysiological data (Figure 2). To facilitate this development, we are developing a Python3-based implementation of OpenEP, `openep-py`.

Conclusion: OpenEP is an open-source platform for analysis of electro-anatomic mapping data under active development. Recent work improves data parsing and analysis functionality and facilitates usability through the development of a graphical interface.

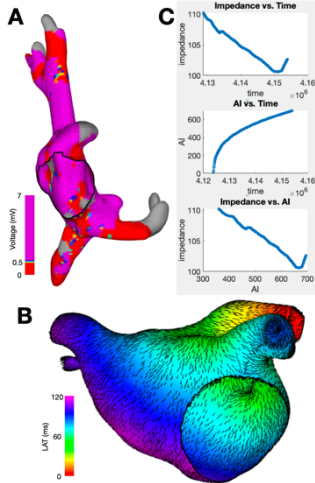


Figure 1. New OpenEP data analysis examples

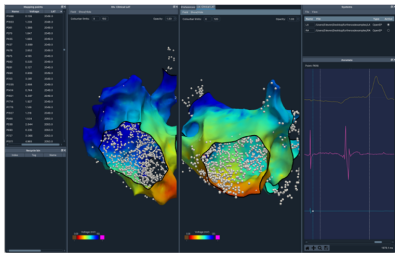


Figure 2. OpenEP graphical interface