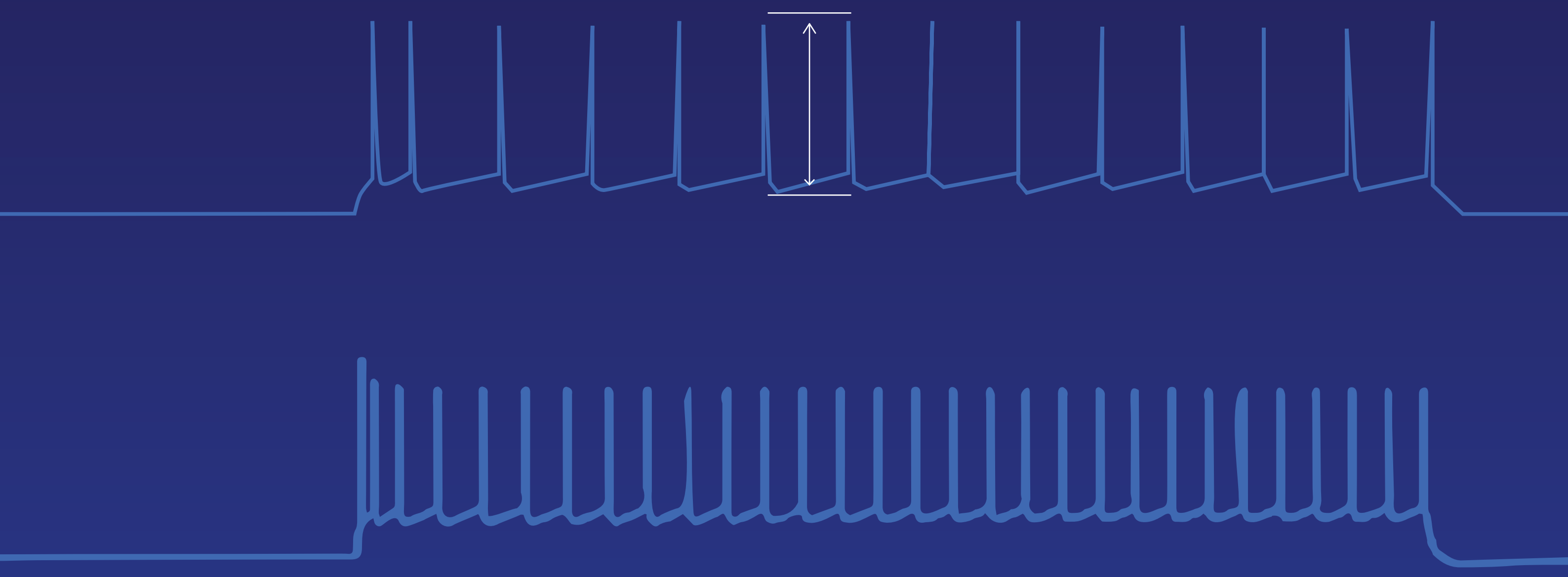
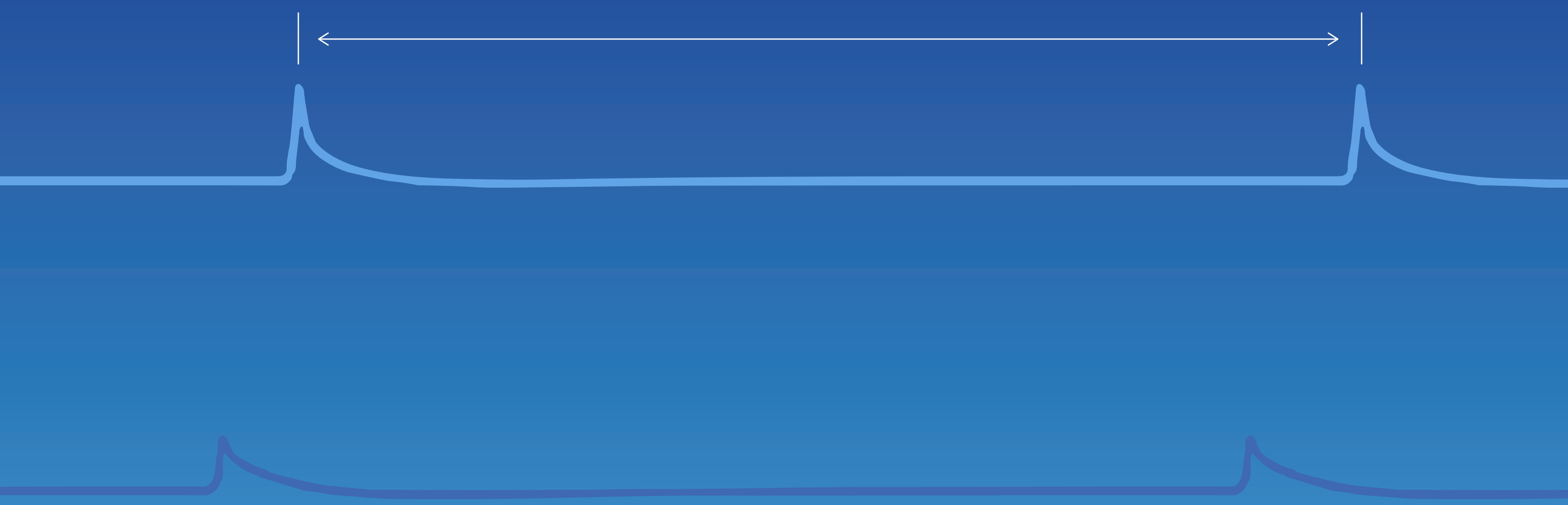
EPFL



Blue Brain
eFEL

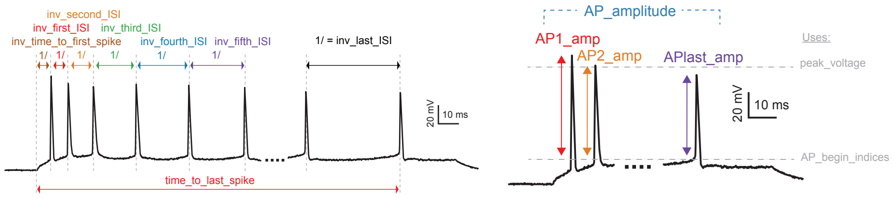


The Electrophys Feature Extraction Library (eFEL) allows neuroscientists to automatically extract features from time series data recorded from neurons (both *in vitro* and *in silico*)

The Electrophys Feature Extraction Library (eFEL) allows neuroscientists to automatically extract features from time series data recorded from neurons (both *in vitro* and *in silico*).

How **eFEL** can assist neuroscientists

Examples of the features eFEL can extract include, the action potential width and amplitude in voltage traces recorded during whole-cell patch clamp experiments.



The user of the library provides a set of traces and selects the features to be calculated. The library will then extract the requested features and return the values to the user.

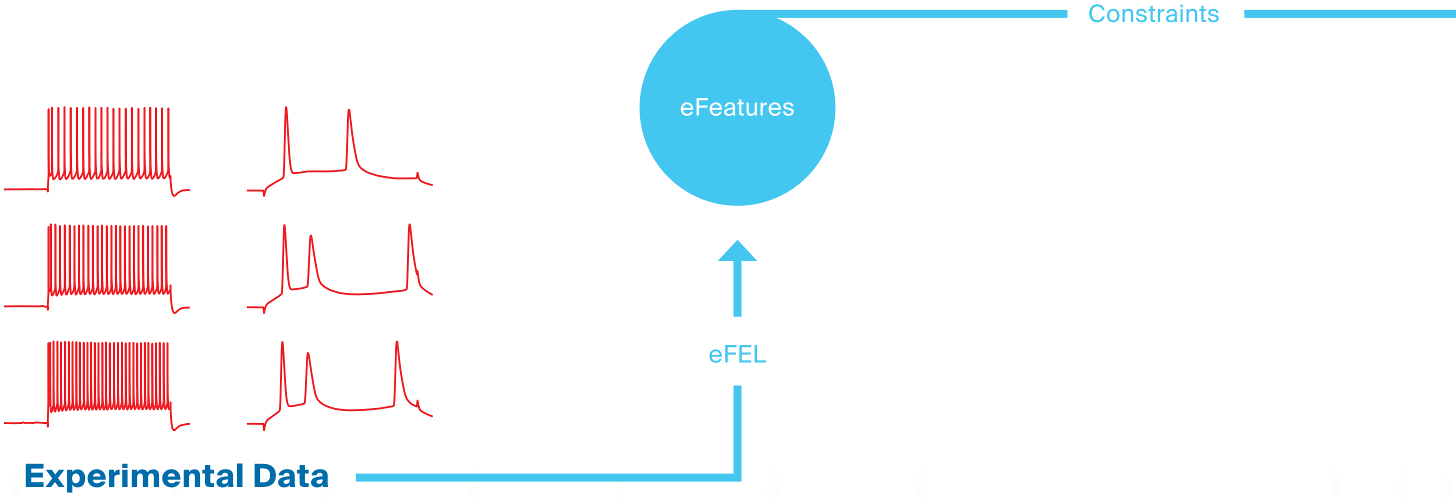
The core of the library is written in C++, and a Python wrapper is provided. There is also a way to automatically compile and install the library as a Python module.

Voltage recordings obtained from patch clamp experiments are an example of experimental data that can be used as a constraint for neuron models. From such recordings the neuroscientist can:

- Deduce many interesting values, like the input resistance of the neuron
- Understand the action potential characteristics, for example, the firing frequency

The eFEL standardizes the way in which such characteristics are extracted and provides an easy-to-use Python interface to perform this task.

How **eFEL** works



Software Adopters

eFEL is extensively used within the **Blue Brain Project**, **Human Brain Project** and in other institutes around the world including the **Allen Institute for Brain Science**.

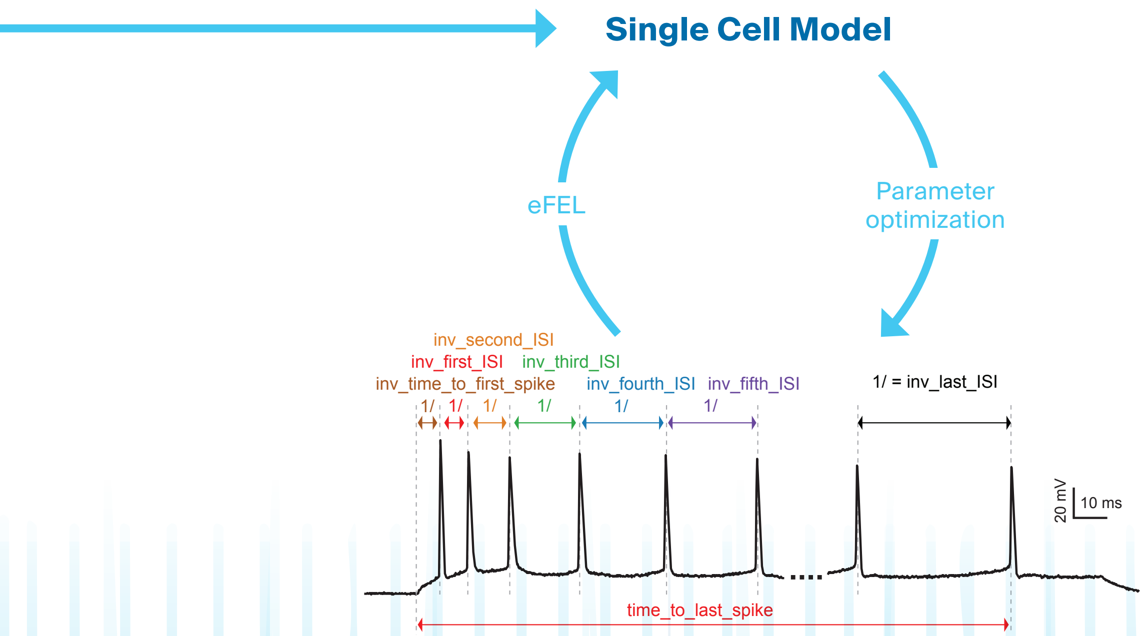
As a companion tool to BluePyOpt, eFEL is used by the groups of **Prof. Michele Migliore** (hippocampus), **Prof. Egidio d'Angelo** (cerebellum), **Prof. Idan Segev** (human cells), the **Science for Life Laboratory KTH** (basal ganglia) and the Allen Brain Institute for Brain Science (mouse visual cortex and human cells). The Blue Brain Project uses it to analyze experimental and model data of neocortical and thalamic cells.

"The eFEL library is a crucial library for the Brain Simulation Platform of the Human Brain Project. It represents a big step forward in engaging the modeling and experimental communities in using common tools to analyze their data. I am sure that its use will soon become a standard practice in the field."

Prof. Michele Migliore, CNR-IBF

"One of the great challenges in cellular and systems neuroscience is reducing experimental data from various techniques into computational models that help establish theories of the brain and computation. In this effort, a key contribution has been the development and deployment of the eFEL and BluePyOpt tools – these tools play a central role in the Allen Institute model generation workflow and the computational models we publish through our web products."

Costas Anastassiou, PhD, Assistant Investigator,
Allen Institute for Brain Science



About EPFL's **Blue Brain Project**

The aim of the EPFL Blue Brain Project, a Swiss brain research initiative founded and directed by Professor Henry Markram, is to establish simulation neuroscience as a complementary approach alongside experimental, theoretical and clinical neuroscience to understanding the brain, by building the world's first biologically detailed digital reconstructions and simulations of the mouse brain.

eFEL is available under Lesser GNU Public License, at: github.com/BlueBrain/eFEL

eFEL can be used on all systems that can run Python and have a C++ compiler installed.
Support is also available using a chat channel:
gitter.im/BlueBrain/eFEL

For more information on eFEL, please contact:

Jean-Denis Courcol
Section Manager, Neuroscientific Software Engineering
Blue Brain Project
jean-denis.courcol@epfl.ch

For technical information on eFEL or to request a demonstration, please contact:

Werner Van Geit
Group Leader, Cells
Blue Brain Project
werner.vangeit@epfl.ch