Abstract: This paper announces the release of version 3.10 of the EIDORS software suite. We review its new features, and discusses its growth and use.

1 Introduction

We proudly announce the release of EIDORS version 3.10, for the 20th Int. Conf. on Biomedical Applications of EIT, in July 2019. The software is available at [eidors.org] and licensed under the GNU GPLv2 or GPLv3. Archived versions are now available on Zenodo [1–4].

EIDORS provides free software algorithms for forward modelling and inverse solutions of Electrical Impedance and (to some extent) Diffusion-based Optical Tomography, in medical, industrial and geophysical settings. EIDORS also aims to share data and promote collaboration amongst its users.

2 New Features

Release 3.10 of EIDORS builds upon a strong foundation in reconstruction algorithms, adding and improving a number of aspects.

- Modelling and management of internal electrodes.
- New electrode specifications on electrode faces (in addition to nodes)
- Improved FEM utility methods (mesh merging, removal, faster boundary calculations)
- Improved support for GNU Octave
- Improved support for GREIT reconstructions in 3D [5]
- Support for caching to disk
- Improved graphics and visualization functions
- Improved support for geophysical FEM models
- Updated utilities for device file formats (new datafile_utility) and integration with SenTec ibeX software.
- Expanded shape library with new species shapes
- (As always) bug fixes

3 Growth

EIDORS-related citations continue to grow. Current citation results are shown in table 1. The EIDORS code-base is growing (fig. 1) with significant effort being applied to improving test coverage, refining performance and implementing new features. In 2012, a dev (development) staging area was created for contributions in progress.

4 Discussion

The structure of EIDORS has been relatively stable due, in part, to some early design choices: a modular framework and data structure, cross-platform support, integration of meshing, tutorials, and the contributed data repository. These aspects, along with an open source code-base, have enabled EIDORS to maintain research relevance. Version 3.10 (hopefully) continues the tradition.

References


Table 1: EIDORS Citations (June 2019, scholar.google.com).

<table>
<thead>
<tr>
<th>Paper</th>
<th>Date</th>
<th>Citations</th>
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<tr>
<td>[7] Image reconstruction algorithms for…</td>
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<td>[10] Uses and abuses of EIDORS: An extensible…</td>
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<td>[11] Simple FEMs aren’t as good as we thought…</td>
<td>2008</td>
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<td>[12] EIDORS version 3.8</td>
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Figure 1: Lines of Code (LoC) in Matlab files in the EIDORS code-base vs. time; Total (red), EIDORS (i.e. release branch, brown), Tutorials (green), development code (blue). Releases are indicated by gray bars (The 3.10 release is at the right).