cbcbeat: an adjoint-enabled framework for computational cardiac electrophysiology

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Summary

cbcbeat (cbcbeat 2017) is a Python-based software collection targeting computational cardiac electrophysiology problems. cbcbeat contains solvers of varying complexity and performance for the classical monodomain and bidomain equations coupled with cardiac cell models. The cbcbeat solvers are based on algorithms described in (Sundnes et al. 2006) and the core FEniCS Project software (Logg et al. 2012). All solvers allow for automated derivation and computation of adjoint and tangent linear solutions, functional derivatives and Hessians via the dolfin-adjoint software (Farrell et al. 2013). The computation of functional derivatives in turn allows for automated and efficient solution of optimization problems such as those encountered in data assimillation or other inverse problems.

The cbcbeat source code is hosted with Bitbucket (https://bitbucket.org/meg/cbcbeat) with documentation on readthedocs (http://cbcbeat.readthedocs.io).

References

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