14th World Congress on Computational Mechanics (WCCM XIV)
8th European Congress on Computational Methods in Applied Science and Engineering (ECCOMAS 2020)
July 19–24, 2020, Paris, France

# DEVELOPMENTS IN AUTOMATIC CODE-GENERATION SOFTWARE FOR COMPUTATIONAL MECHANICS 1400

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**Key words:** Automated Computation, Domain specific languages, Code Generation, Open-source software

## ABSTRACT

With the recent advent of modern programming technologies, many open-source high-level softwares have emerged for automating the solution of PDE systems e.g. [1, 2, 3, 4]. Such solutions usually simplify the formulation of the underlying physical problem from the user's point-of-view using domain-specific languages, and automate their resolution through optimised code-generation tools. Computational efficiency is also an important aspect of such solutions which generally rely on scalable linear algebra libraries and automated parallelism.

This minisymposium will aim at gathering users and developers of such kind of software solutions to exchange on recent developments of core functionalities, computational optimisation, current challenges or new applications on complex computational mechanics problems. In particular, applications in which automated solution software are particularly attractive may include but are not limited to:

- multi-physics coupling or complex material constitutive behaviours
- generalised or high-order mechanical models
- reduced-order modelling of parametrised problems
- optimal control and shape optimisation
- uncertainty quantification

Examples of usage of automated solution software by industrial partners are also welcome.

## REFERENCES


[1] FreeFEM, https://freefem.org/

[2] FEniCS Project, https://fenicsproject.org/

[3] Firedrake, https://www.firedrakeproject.org/index.html

[4] GetFEM++, http://getfem.org/index.html