

# Methods in Applied Nonlinear Analysis

## ManiFEM, a C++ library for finite elements on manifolds

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We present `maniFEM`, a C++ library for solving partial differential equations through the finite element method. The name comes from "finite elements on manifolds". `ManiFEM` was designed with the goal of coping with very general meshes, in particular meshes on Riemannian manifolds. The case of the "flat torus"  $\mathbb{R}^n/\mathbb{Z}^n$  is of interest for implementing periodicity boundary conditions.

`ManiFEM` was written with the goal of being conceptually clear and easy to read. We hope it will prove particularly useful for people who want a fine control over the mesh, e.g. for implementing their own meshing or remeshing algorithms.

Several examples will be presented focusing on mesh generation and on simple finite elements.

This is a joint work with Anca-Maria Toader.

## References

- [1] <http://manifem.rd.ciencias.ulisboa.pt/>