COMPUTATIONAL DIFFERENTIAL-GEOMETRIC METHODS IN MULTIBODY DYNAMICS AND COUPLED PROBLEMS

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ABSTRACT

Geometric modeling of dynamical systems is a field of extensive on-going research during last decades. It has proven to be an approach that provides very useful insights into the dynamics and control of mechanical systems, from a theoretical as well as from a computational point of view. Although numerous algorithms, developed on this ground, have found application in many important areas of engineering, a more widespread application of these concepts within engineering communities are yet to happen.

However, the situation is changing rapidly and within research communities of various foci (in the spectrum from multibody system dynamics and non-linear control to computational coupled problems and CFD), there is a growing interest in exploring geometric mathematical background with the aim of re-visiting some 'classical' algorithms as well as finding new solutions. This mini-symposium is intended as platform to present and discuss recent progress in the field. Contributions are solicited, but not limited, on the following topics:

- discrete mechanics
- continua and structures
- multibody systems (rigid or flexible)
- holonomic and non-holonomic systems
- fluid-structure interaction
- non-linear control (robotics, biomechanics, autonomous systems)
- electro-mechanical applications
- contact mechanics
- energy/momentum preserving integration schemes
- Lie-group integration schemes (finite rotations and constraints)

These and other geometric issues pertinent to multibody system dynamics and computational
coupling problems will be addressed within the framework of the mini-symposium.

REFERENCES


