

A parallel iterative method for variational integration

David Martín De Diego
(ICMAT, Spain)

April 27, 2022
16:00-17:00h **on campus in M.G.005**
Analysis & Geometry Seminar, Antwerpen

Discrete variational methods have shown an excellent performance in numerical simulations of different mechanical systems. In this talk, we introduce an iterative method for discrete variational methods appropriate for boundary value problems analyzing the convergence of the proposed methods. More concretely, we explore a parallelization strategy that leverages the capabilities of multicore CPUs and GPUs (graphics cards). We study this parallel method for higher-order Lagrangian systems, which appear in fully-actuated problems and beyond. We carefully study the convergence conditions for these methods and illustrate their excellent behavior in some interesting applications, namely Zermelo's navigation problem, a fuel-optimal navigation problem, interpolation problems etc.