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Center for Computational Mathematics Seminar

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Geometric integrator for stiff system, Lie group and Control system

Abstract:

Geometric integrator for classic mechanics has provided fruitful results. In this talk, we consider generalizations to three special settings. One is stiff system which comes from semi-discretization of Hamilton PDE, traditional exponential integrators are modified to preserve Poisson structure and energy; one is for Lie group, where configuration space is Lie group, group structure of space is considered to construct variational integrator, in contrast to constrained mechanics; the final is Control system, we take into account nonobservability analysis of control system, which appears as invariance of special group actions, Kalman Filter is modified based on decomposition of space. Such reduced Filter attains state of art result.

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