

COMPUTATIONAL MATHEMATICS SEMINAR

Numerical Computational Techniques for Nonlinear Optimal Control

Friday, June 29th, 2018, 9:30h.
TIMON Room at DeustoTech

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Abstract:

The stable-manifold method proposed by Sakamoto and van der Schaft in 2008 provides an effective approach to nonlinear optimal control. In this talk, I present two numerical computational techniques for its improvement. The first technique is for generation of points on the stable manifold in a robust way against numerical errors. There, a special numerical method that preserves Hamiltonian is used to solve a differential equation sensitive to numerical errors. The second technique is a sort of shooting method to generate a point corresponding to the desired system state. These techniques are used for optimal swing-up of a pendulum and successfully give a swing-up trajectory with multiple swings. This is a joint work with Noboru Sakamoto and Takuto Nakamura.