

Online seminar

Monday November 09, 2020 at 16:30 Hosted on: Meet

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Hybrid control and quasi-variational Hamilton-Jacobi inequalities, numerical aspects and application to sailing navigation and traffic problems

Prof. Berrone introduces the seminar.

Abstract

In this seminar we discuss the extension of the classic dynamic programming approach to hybrid control systems, where a continuous controller can switch between a finite collection of states, paying a cost of switching. This approach requires the resolution of a system of quasi-variational Hamilton-Jacobi inequalities that we propose to approximate via a semi-Lagrangian scheme obtained by the direct discretization of the dynamical programming principle. We discuss the application of such a framework to model a sailing boat navigation problem for the optimization of the strategic choices on a racecourse and the optimal management of the traffic on a multi-lane road, using a mean-field game inspired model.

Biography

Adriano Festa is a researcher (RTDb) at DISMA, Politecnico di Torino. He discussed his PhD in Rome in 2012 with a thesis on the numerical approximation of non-linear hyperbolic partial differential equations. His areas of expertise include: Numerical techniques for Hyperbolic PDEs, Optimal Control, Mathematical Modelling. He has been a RTDa at University of L'Aquila, associate researcher (Marie-Curie Fellow) at Imperial College London (UK), ENSTA ParisTech and INSA Rouen (France), RICAM (Austria), and visiting professor at University of Mannheim (Germany).