



UNIVERSITÀ
DI TRENTO

Dipartimento di
Matematica

DOTTORATO



CYCLE 34th
ORAL DEFENCE OF THE PHD THESIS

Thursday 30 June 2022 – at 2:00 pm
Seminar room “-1”

The event will take place in presence and online through the ZOOM platform.
To get the access codes please contact the secretary office

Chiara Segala

PhD Student in Mathematics

Robust control strategies for mean-field collective dynamics

Abstract:

The main topic of the talk is the synthesis of control laws for interacting agent-based dynamics and their mean-field limit. In particular, a linearization-based approach is used for the computation of sub-optimal feedback laws obtained from the solution of differential matrix Riccati equations. Quantification of dynamic performance of such control laws leads to theoretical estimates on suitable linearization points of the nonlinear dynamics. Subsequently, the feedback laws are embedded into a nonlinear model predictive control framework where the control is updated adaptively in time according to dynamic information on moments of linear mean-field dynamics. The performance and robustness of the proposed methodology is assessed through different numerical experiments in collective dynamics. In the last part of the talk I will present some related projects, robustness of systems with uncertainties, a proximal gradient approach for sparse control and an application in crowd evacuation dynamics.

Supervisor: Giacomo Albi

CONTATTI

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