

DIMEAS SEMINAR

ADAPTIVE CONTROL OVER REPRODUCING KERNEL HILBERT SPACES WITH AEROSPACE APPLICATIONS



SPEAKER



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Abstract

In this seminar, the presenter will introduce a completely new approach to robust and adaptive control theory whereby uncertainties are captured as elements of a reproducing kernel Hilebert space (also known as native spaces). Thus far, robust and adaptive control systems relied either on estimates on the upper bounds of the uncertainties or finite-dimensional parameterizations of the functional nonlinearities. With the proposed array of approaches, neither pieces of information are required. Additional value on these approaches lies in the controllers' ability to estimate a priori the ultimate bounds on the trajectory tracking error based on the estimated smoothness of the uncertainties or disturbances and on the density of kernels characterizing the native space. Applications to aerospace systems show the applicability of the proposed results.

Biography

Dr. Andrea L'Afflitto is an associate professor at Virginia Tech and his expertise is in robust adaptive control and optimal control theory with applications to aerospace and automotive systems. Dr. L'Afflitto is the author of 3 book and more than 60 journal and conference papers. Dr. L'Afflitto has been recognized for his work being appointed AIAA Associate Fellow and the DARPA Young Faculty Award, and currently serves as the senior editor for the Autonomous Systems track of the IEEE Transactions on Aerospace and Electronics Systems.



Friday 13 June 2025, 2:30 pm



Meeting room, III floor, DIMEAS – Politecnico di Torino