



**POLITECNICO  
DI TORINO**



Dipartimento di  
Scienze Matematiche  
G. L. Lagrange

**ECCELLENZA 2018 • 2022**

**Seminario  
on-line**

Tuesday **July 07, 2020** at 17:00

Hosted on: **Zoom**

**Riccardo BONALLI**

Postdoctoral Researcher at Stanford University

## **Towards Principled Algorithms for Stochastic Optimal Control of Nonlinear Mechanical Systems**

Prof Como introduces the seminar.

### **Abstract**

Nowadays, achieving efficient computations of optimal trajectories for robotic systems represents a hard problem. In particular, the presence of nonlinearities and uncertainties affecting the outcome makes this task very challenging. With the objective of introducing optimal control strategies that address those difficulties, in this talk Dr Bonalli will discuss a framework based on Sequential Convex Programming (SCP), from both theoretical and numerical perspectives. First, he will detail the operating principle of SCP under deterministic settings, allowing to satisfactorily handle nonlinearities. Then, he will show how this framework may be molded to additionally cope with uncertainties.

### **Biography**

Riccardo Bonalli received an M.Sc. degree in mathematical engineering from Politecnico di Milano in 2014, and a Ph.D. degree in applied mathematics from Sorbonne Université in 2018, in collaboration with ONERA—The French Aerospace Lab. He is currently a Postdoctoral Researcher with the Department of Aeronautics and Astronautics at Stanford University. His research interests include theoretical and numerical optimal control with applications in aerospace engineering and robotics.