



Università  
di Genova

DICCA DIPARTIMENTO  
DI INGEGNERIA CIVILE, CHIMICA  
E AMBIENTALE

DICCA  
SEMINARS

Professor MAURIZIO PORFIRI  
New York University, Tandon School of Engineering  
“When zebrafish met engineering”



ABSTRACT

Zebrafish are gaining momentum as the third millennium laboratory species for the investigation of several functional and dysfunctional biological processes in humans, including the fundamental mechanisms modulating emotional patterns, learning processes, and individual and social response to alcohol and drugs of abuse. Dynamical systems and robotics offer a powerful range of theoretical and experimental approaches that can advance our understanding of this animal model. In this talk, we report recent advances on: (i) the design of biomimetic robotic fish to elicit highly-controllable and customizable stimuli for laboratory experiments on zebrafish behavior; (ii) the formulation of a new data-driven modeling framework to study zebrafish behavior within unprecedented “in silico” experiments that can help reduce the number of animals in preclinical studies; and (iii) the integration of information-theoretic tools to unravel leader-follower interactions in groups of zebrafish and measure fear response to predators. The presentation is intended to expose neuroscientists to toolbox of methodological innovations that can enhance their experiments, while offering engineers an overview of fundamental mathematical and technological advancements that can find applications beyond the study of zebrafish.

**REINFORCED GREEN PASS NEEDED FOR THE ATTENDANCE OF THE SEMINAR**



Friday, June 10th  
4 pm



Streaming on the Teams  
channel (CODE: wlp9vyt)

or using this link:

<https://shorturl.at/dknxR>



Villa Cambiaso - Salone Nobile  
Via Montallegro 1 (GE)  
School of Engineering, UNIGE



[dicca.seminari@gmail.com](mailto:dicca.seminari@gmail.com)



@diccaseminars