Monika Pasquali

PhD Candidate in Control Systems Engineering

I am someone who is always eager to learn something new, and what can be better than being at the forefront of research. After graduating, I was offered a PhD position in Airborne Wind Energy Systems at the University of Bordeaux (France). This experience allows me to strengthen my expertise in Control Systems, to explore new scientific frontiers, to make meaningful contributions and, most importantly, to develop a solid research methodology.

Contact

Date of Birth

16/11/1999

Email

monika.pasquali@u-bordeaux.fr

Languages

Italian (mother tongue), English, French

Education

Oct 2023 - Sep 2026
PhD in Control Systems Engineering
University of Bordeaux, France

Sep 2021 - Sep 2023
Master degree in Control Systems Engineering.
University of Padova, Italy

Sep 2018 - Sep 2021
Bachelor degree in Industrial Engineering
University of Padova, Italy

2013 - 2018
Scientific high school
Liceo Niccolò Copernico, Italy.
Exchange program at 'Prospect high school' of Chicago, USA.

Technical skills

- Programming languages: Matlab, Python, C++, Java
- Softwares: Simulink, Maple, General algebraic modeling system (GAMS), Minitab
- Good knowledge of Microsoft Office package and LaTeX

Soft Skills

Excellent study and work organisation skills. Good ability to work in a team, excellent ability to learn autonomously, good relational skills.

Current Publications

1. Pasquali M, Airimitoaie TB, Lanusse P. Flat dynamic model analysis of a delta-wing convertible aircraft. IFAC-PapersOnLine. 2024 Jan 1;58(21):67-72.
2. Pasquali M, Ndreko E, Airimitoaie TB, Farges C, Lanusse P. Optimal flight trajectories of a tethered kite for ship propulsion under variable wind conditions. IEEE 2024 (in press).
3. Ndreko E, Pasquali M, Airimitoaie TB, Farges C, Lanusse P. Rigid Body Modeling and Dynamic Flight Control of a Tethered Kite. IEEE 2024 (in press).

Experience

October 2023 - ongoing

PHD IN CONTROL SYSTEMS ENGINEERING - Nonlinear control and supervision of a tethered kite for ship propulsion

University of Bordeaux, France

The PhD is carried out in collaboration with the company Beyond the Sea (see KiWin project and https://beyond-the-sea.com/en/), which offers auxiliary traction force for ship propulsion through tethered kites.

2nd Year (Oct 2024-ongoing)

Proof of differential flatness property of the kite. Design of a flatness-based feedforward control for a periodic system (with varying period). Improvements in trajectory's tracking for different wind conditions compared to a feedback control, are achieved.

1st Year (Oct 2023-Oct 2024)

Point-mass modeling of the kite's dynamics. Development of an Optimisation genetic-based algorithm for the trajectories' positions in the flight window, to maximise the traction force in the boat's direction. Variations of the wind direction with respect to the boat's axis, are considered.

Relevant related activities

- Teaching Assistant at Engineering school INP BORDEAUX. Matlab and Simulink course.
- EECI COURSE: Introduction to nonlinear systems and control. University of Paris-Saclay.
- EECI COURSE: Equivariant observers, application to autonomous systems. University of Trondheim, NTNU, Norway.
- Ndreko E*, Pasquali M*, Airimitoaie TB, Farges C, Lanusse P. Nonlinear Modelling and Fractional Robust Control for Ship Propulsion by Tethered Kite. ICFDA2024. Poster session.

March 2023 - July 2023

RESEARCH INTERNSHIP - Modeling and differential flatness based control for a convertible aircraft

University of Bordeaux, France

Dynamic modeling of a delta-wing convertible aircraft with two rotors, capable of vertical takeoff and landing (VTOL). Proof of the differential-flatness property for designing the open-loop control. A robust feedback is also introduced. See my first author **related publication 1.** in Section Current Publications.

September 2021 - September 2023

MASTER DEGREE - Control Systems Engineering

University of Padova, Italy

Entirely in English. Strong competencies in **Linear and Nonlinear systems theory**, **ground and aereal robotics**, **Adaptive and Model Predictive Control**, control of industrial manipulators, **Machine Learning**, both supervised and unsupervised learning, **Digital control**, **Estimation and filtering**, mainly focused on Kalman filter and Bayesian estimation, **Convex optimization** and **Computer Vision**. This course has in program lots of laboratory experiences and group projects