Mattia Giurato

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Areas of specialisation

Control theory, model identification, state estimation, UAV flight control, UAV design.

Education

Mar. 2019 – Jul, 2019 **LAAS-CNRS Toulouse, France**, *Visiting researcher*.
Title of the project: *"FAST-Hex: a FullyActuated by SynchronizedTilting Hexarotor"*, supervisor Antonio Franchi, Ph.D.

Nov. 2016 – Present **Politecnico di Milano, Italy**, *Ph.D.*, *Aerospace Engineering*.
Title of thesis: *"Design, integration and control of multirotor UAV platforms"*, supervisor Prof. Marco Lovera

Oct. 2013 – Dec. 2015 **Politecnico di Milano, Italy**, *M.Sc.*, *Automation and Control Engineering*.

Sep. 2010 – Oct. 2013 **Politecnico di Milano, Italy**, *B.Sc.*, *Automation and Control Engineering*.

Work Experience

Mar. 2016 – Nov. 2016 **Politecnico di Milano, Italy**, *Research assistant at Department of Aerospace Science and Technologies*.
Title of the project: *"Modelling, identification and control of multirotor UAV"*, supervisor Prof. Marco Lovera

Publications

Journal papers

Very high accuracy attitude determination for LOS steering, *M. Giurato, S. Panza, M. Lovera, G. Sechi (in preparation)*.

2018 **Adaptive augmentation of the attitude control system for a multirotor UAV**, *G. Bressan, A. Russo, D. Invernizzi, M. Giurato, S. Panza, and M. Lovera*.
Journal of Aerospace Engineering

Conference papers

2019 **A computer vision line-tracking algorithm for UAV GNSS-aided guidance**, *G. Roggi, M. Giurato, M. Lovera*.
XXV AIDAA, International Congress, Roma, Italy, 2019

UAV Lab: a multidisciplinary UAV design course, *M. Giurato, P. Gattazzo, M. Lovera*.
21st IFAC Symposium on Automatic Control in Aerospace, Cranfield, UK, 2019

Air-to-air automatic landing for multirotor UAVs, *P. Giuri, A. Marini Cossetti, M. Giurato, D. Invernizzi, M. Lovera*.
5th CEAS Conference on Guidance, Navigation and Control, Milano, Italy

2018 **Robust filtering for very high accuracy attitude determination**, *M. Giurato, S. Panza, M. Lovera*.
58th Israel Annual Conference on Aerospace Sciences, Tel Aviv and Haifa, Israel, (accepted)

Full pose tracking for a tilt-arm quadrotor UAV, *D. Invernizzi, M. Giurato, P. Gattazzo, M. Lovera*.
IEEE Conference on Control Technology and Applications, Copenhagen, Denmark

2017 **Ground effect analysis for a quadrotor platform**, *D. Del Cont Bernard, M. Giurato, F. Riccardi, M. Lovera*.
4th CEAS Specialist Conference on Guidance, Navigation and Control, Warsaw, Poland

A dynamic analysis of ground effect for a quadrotor platform, *D. Del Cont Bernard, F. Riccardi, M. Giurato, M. Lovera*.
20th IFAC World Congress, Toulouse, France

Accurate positioning of multirotor UAVs for civil infrastructure monitoring, *D. Di Bacco, M. Giurato, M. Lovera*.
7th European Conference for Aeronautics and Space Sciences, Milano, Italy

Very high accuracy attitude determination for LOS steering, *F. Haydar, M. Giurato, M. Lovera, G. Sechi*.
10th International ESA Conference on Guidance, Navigation and Control Systems, Salzburg, Austria

Adaptive augmentation of the attitude control system for a multirotor UAV, A. Russo, D. Invernizzi, M. Giurato, M. Lovera.
7th European Conference for Aeronautics and Space Sciences, Milano, Italy

2016 **Quadrotor attitude determination: A comparison study**, *M. Giurato, M. Lovera*.
2016 IEEE Conference on Control Applications (CCA), Buenos Aires, Argentina

2015 **Low Cost MEMS IMU Calibration For Aerospace Student Activities**, *A. Rivolta, M. Giurato, F. Cuzzocrea, F. Rovere, and S. Farí*.
1st Symposium On Space Educational Activities

Book chapters

2018 **Ground effect analysis for a quadrotor platform**, *D. Del Cont Bernard, M. Giurato, F. Riccardi, M. Lovera*, Advances in Aerospace Guidance, Navigation and Control, Springer.

Teaching

First semester AY 2018/19 **Politecnico di Milano, Italy**, *Teaching assistant in Estimation in Aerospace*.
M.Sc. course in Aeronautical Engineering/Space Engineering (8CFU), held by Prof. Marco Lovera

First semester AY 2018/19 **Politecnico di Milano, Italy**, *Teacher of "UAV Lab"*.
Interdisciplinary course held together with Prof. Marco Lovera

Thesis tutoring

2019 **Data-driven multivariable attitude control design for multirotor UAV platforms**, *A. Zangarini*, M.Sc. in Aeronautics Engineering.

Adaptive control implementation to include ground effect on UAV simulator, *U. Arshad*, M.Sc. in Aeronautics Engineering.

UAV autonomous landing on a moving aerial vehicle, *G. Gozzini*, M.Sc. in Aeronautics Engineering.

Modelling, identification and control of a fixed-wing UAV, *A. Gatti*, M.Sc. in Aeronautics Engineering.

2018 **Design and optimization tool for multirotor unmanned aerial vehicles**, *E. Balcioglu*, M.Sc. in Aeronautics Engineering.

Hardware/software architecture, code generation and control for multirotor UAVs, *G. Bressan*, M.Sc. in Computer Science and Engineering.

Multirotor UAVs for fugitive emissions detection: sizing, modelling and control system design, *M. Maccotta*, M.Sc. in Automation and Control Engineering.

Air-to-air automatic landing for multirotor UAVs, *P. Giuri, A. Cossetti*, M.Sc. in Aeronautics Engineering.

Optimal and robust UAV state estimation based on Gps and optical flow, *S. Musacchio*, M.Sc. in Aeronautics Engineering.

2017 **Guidance and control for a fixed-wing UAV**, *S. Farì*, M.Sc. in Automation and Control Engineering.

Ground effect compensation for multicopter UAV, *R. Salbati*, exchange student from the Université de Liège (ULg), M.Sc. in Aeronautics Engineering.

Design, identification and control of a micro aerial vehicle, *D. Chevallard*, M.Sc. in Aeronautics Engineering.

Consensus based control for a unmanned aerial vehicle formation, *A. Delbono*, M.Sc. in Computer Science and Engineering.

Nonlinear attitude and position control for a quadrotor UAV, *D. Carelli*, M.Sc. in Automation and Control Engineering.

Nonlinear control of a tilt-arm quadrotor UAV, *P. Gattazzo*, M.Sc. in Automation and Control Engineering.

2016 **Data-driven attitude control design for multirotor UAVs**, *T. Chupin*, M.Sc. in Automation and Control Engineering.

Adaptive control of multirotor UAVs, *A. Russo*, M.Sc. in Automation and Control Engineering.

Software architecture, estimators and control for multirotor UAVs, *A. De Angelis, A. Sorbelli*, M.Sc. in Computer Science and Engineering.

Ground effect analysis for a quadrotor platform, *D. Del Cont Bernard*, M.Sc. in Aeronautics Engineering.

Distance control from vertical surfaces of a multirotor UAV designed for Structural Health Monitoring of civil infrastructures, *D. Di Bacco*, M.Sc. in Aeronautics Engineering.

Design, identification and control of a tiltrotor quadcopter UAV, *C. Micheli*, M.Sc. in Automation and Control Engineering.

Identificazione e controllo della dinamica verticale di un elicottero quadrirotore, *M. Ferronato*, M.Sc. in Automation and Control Engineering.

Certifications

Feb. 2017 **Creative Technologies in the Classroom 101 Trainer**, *Arduino*.

Mar. 2014 **Simulink for System and Algorithm Modelling**, *MathWorks Training Services*.

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