Andrea Iannelli

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Brief biography

Andrea Iannelli is a postdoctoral researcher with the group of Prof. Roy Smith in the Automatic Control Laboratory (IfA) at ETH Zürich since May 2019. He was born in Ascoli Piceno, and completed the Bachelor (2011) and Master degrees (2014) in Aerospace Engineering at the University of Pisa (Italy). During the master studies (2013), he was a visiting researcher at San Diego State University (US), where he worked on fluid-structure interaction solvers for aeroelastic analysis of unconventional aircraft configurations. In April 2019 he completed his PhD in Control and Dynamical systems at the University of Bristol (UK) in the TASC research group, funded by the H2020 project FLEXOP.

Research interests

During his PhD Andrea focused on the reconciliation between robust control modelling and analysis techniques (Linear Fractional Transformation, μ analysis, Integral Quadratic Constraints, Dissipativity) and dynamical systems approaches (bifurcation theory, numerical continuation), with application to the study of dynamic instabilities in uncertain aeroelastic systems.
With the goal of developing novel principled techniques for modelling, analysis, and control of unknown or uncertain dynamical systems, during the PostDoc he has broadened his interests to the data-driven world. Its reconciliation with control theory methods and tools is deemed key to achieve safety and reduce conservatism for autonomous operation of complex systems. Fields of interest include: Data-driven Modeling and Control; System Identification; Robust Control; Optimization-based control; Dynamical Systems Theory. The overarching goal of his research is to contribute to progress on the design of intelligent systems for a sustainable society, especially in the fields of energy and transportation systems: e.g. sustainable aerospace systems; industrial robots; smart cities.

Selected publications (full list here)

- **Iannelli A.**, Seiler P., Marcos A. “Worst-case disturbances for Time-Varying systems with application to flexible aircraft“. *J. of Guidance, Control, and Dynamics*, 2019. Link
- **Iannelli A.**, Seiler P., Marcos A. “Region of attraction analysis with Integral Quadratic Constraints“. *Automatica*, 2019. Link
- **Iannelli A.**, Lowenberg M., Marcos A. “Computation of bifurcation margins based on robust control concepts“. *SIAM Journal on Applied Dynamical Systems*, 2020. Link
- **Iannelli A.**, Smith R. S. “A multiobjective LQR synthesis approach to dual control for uncertain plants“. *IEEE Control Systems Letters*, 2020. Link
- Yin M., **Iannelli A.**, Smith R. S. “Maximum Likelihood Estimation in Data-Driven Modeling and Control“. *IEEE Transactions on Automatic Control*, 2021. Link
- **Iannelli A.**, Fasel U., Smith R. S. “The Balanced Mode Decomposition Algorithm for Data-Driven LPV Low-Order Models of Aeroservoelastic Systems“. *Aerospace Science and Technology*, 2021. Link