Tommaso **Grigoletto**

POSTOCTORAL FELLOW

Department of Information Engineering, University of Padova
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Research Experience

POSTDOCTORAL FELLOW - *University of Padua, Padua, Italy*　　　　　　　　　*Jul. 25 - Jul. 26*
- Project: Developing aggregation methods for network model reduction
- Advisors: Prof Mattia Zorzi and Prof. Francesco Ticozzi

POSTDOCTORAL FELLOW - *University of Padua, Padua, Italy*　　　　　　　　　*Nov. 23 - Jun. 25*
- Project: Approximate reduction methods for classical and quantum networks
- Advisor: Prof. Francesco Ticozzi

VISITING SCHOLAR - *Dartmouth College, Hanover, NH (USA)*　　　　　　　　　*Aug. 22 - Feb. 23*
- Project: Exact model reduction for continuous-time quantum dynamics
- Advisor: Prof. Lorenza Viola

Teaching Experience

Fall 24	**Fundamentals of Automation Engineering**, Lecturer - 48 hrs, Bachelor's degree in Engineering Physics	*Ca'Foscari*
Fall 23	**Fundamentals of Automation Engineering**, Lecturer - 48 hrs, Bachelor's degree in Engineering Physics	*Ca'Foscari*
Spring 23	**Control Engineering Laboratory**, Teaching Assistant Master's degree in Control Systems Engineering	*UniPD*
Spring 22	**Control Engineering Laboratory**, Teaching Assistant, Master's degree in Control Systems Engineering	*UniPD*

Education

University of Padua - *Padua, Italy*　　　　　　　　　　　　　　　　　　*Oct. 20 - Sep. 23*
PH.D. IN INFORMATION ENGINEERING
- Thesis: Exact model reduction for quantum systems
- Advisor: Prof. Francesco Ticozzi
- Defended March 21st, 2024, with honors.

University of Padua - *Padua, Italy*　　　　　　　　　　　　　　　　　　*Oct. 18 - Jul. 20*
M.SC. IN AUTOMATION ENGINEERING
- Thesis: Measurement-based switching control for quantum systems
- Advisor: Prof. Francesco Ticozzi
- Final grade: 110/110

University of Padua - *Padua, Italy*　　　　　　　　　　　　　　　　　　*Oct. 15 - Jul. 18*
B.SC. IN INFORMATION ENGINEERING
- Thesis: Control system for a rocket soft landing
- Advisor: Prof. Mauro Bisiacco
- Final grade: 106/110

I.T.I.S. Rossi - *Vicenza, Italy*　　　　　　　　　　　　　　　　　　　*Sep. 10 - Jul. 15*
HIGH SCHOOL
- Thesis: Control system for a quadcopter
- Advisor: Prof. Paolo Fumene Ferruglio
- Final grade: 94/100

Awards, Fellowships, & Grants

2022   **Gini scholarship**, Fondazione Aldo Gini, University of Padua
2020   **Ph.D. scholarship**, University of Padua
2015   **Tekne scholarship**, Regione Veneto
2014   **Leonardo scholarship**, Fondazione Centro Produttività Veneto
2013   **Partecipated to the Robocup World Cup**, in Eindhoven

Seminars and lectures

March 13th 2025 - **"Exact Model Reduction for Quantum Dynamics"**,
Invited talk at Quantum Nano Seminar - Dartmouth College

January 20th 2025 - **"Applications of quantum conditional expectations"**,
Two-hour lecture included in the Ph.D. course "Quantum Probability Information and Dynamics" held by Francesco Ticozzi, University of Padua

January 10th 2025 - **"Quantum conditional expectation and the Takesaki Theorem"**,
Two-hour lecture included in the Ph.D. course "Quantum Probability Information and Dynamics" held by Francesco Ticozzi, University of Padua

December 2024 - **"Exact Model Reduction for Discrete-Time Conditional Quantum Dynamics"**,
Invited session at IEEE Conference on Decision and Control, Milan

March 21st 2024 - **"Exact model reduction for quantum systems"**,
Ph.D. Thesis defense, University of Padua

September 22nd 2023 - **"Exact model reduction for Quantum Systems: an algebraic approach"**,
Invited talk at Inria Paris, Quantic group

June 27th 2023 - **"Exact model reduction for Quantum Systems: an algebraic approach"**,
Seminar talk for the quantum lunch at the department of information engineering, University of Padua

December 2022 - **"Minimal resources for exact simulation of quantum walks"**,
IEEE Conference on Decision and Control, Cancun

April 2022 - **"Algebraic reduction of Hidden Markov Models"**,
Seminar talk at the department of information engineering, University of Padua

Mentoring

BACHELOR THESIS

In Progress	**Giacomo Girotto**, "Experiments on a single qubit quantum computer", Supervisor: **T.G.**	*Ca'Foscari*
In Progress	**Rosanna Mantese**, "Control of a Boeing v-22 Osprey", Supervisor: **T.G.**, Co-Supervisor: Matthias Pezzutto	*Ca'Foscari*
2025	**Stefano Santello**, "Control of a rocket soft-landing", Supervisor: **T.G.**, Co-Supervisor: Matthias Pezzutto	*Ca'Foscari*
2025	**Stefano Santello**, "Analysis and control of a pendulum actuated with reaction wheels", Supervisor: **T.G.** , Co-Supervisor: Matthias Pezzutto	*Ca'Foscari*
2025	**Marco Tesio**, "Simulation of quantum systems using quantum computers", Supervisor: **T.G.**	*Ca'Foscari*
2025	**Marco Vanzetto**, "Parameter estimation for closed quantum systems", Supervisor: **T.G.**	*Ca'Foscari*
2024	**Giuseppe D'Auria**, "Computer based state observers for magnet systems", Supervisor: Damiano Varagnolo, Co-Supervisor: **T.G.**	*UniPD*
2024	**Jacopo Tomasetig**, "Modelling and Control of tire-road interaction dynamics", Supervisor: **T.G.**	*Ca'Foscari*
2024	**Alessandra Dal Bello**, "Tracking visual markers for maglev platforms", Supervisor: **T.G.**, Co-Supervisor: Damiano Varagnolo	*Ca'Foscari*

Professional skills

Reviewing, service and outreach

- Reviewed for various journal and conferences including: IEEE Control System Letters (11 papers), IEEE Conference on Decision and Control 2024 (4 papers), IEEE Conference on Decision and Control 2025 (2 papers), International Journal of control (1 paper), Journal of Physics A (1 paper).
- Co-organizer with Prof. Ticozzi of the Invited session "New tools for estimation, modeling and control of quantum systems" at the Conference on Decision and Control 2024.

Languages

Mother tongue:	**Italian**
Other languages:	**English ($\simeq$ C1 level)**

Programming skills

Basic:	**ECDL, CAD design, HTML, JavaScript, PLC programming languages**
Intermediate:	**Java, C++, Excel**
Advanced:	**Python, Matlab, Latex**

Publications

Journal

[2] **T. Grigoletto** and F. Ticozzi. "Stabilization via feedback switching for quantum stochastic dynamics". In: *IEEE Control Systems Letters* 6 (2021), pp. 235–240. DOI: 10.1109/LCSYS.2021.3065603.

[4] **T. Grigoletto** and F. Ticozzi. "Algebraic Reduction of Hidden Markov Models". In: *IEEE Transactions on Automatic Control* 68.12 (2023), pp. 1–16. DOI: 10.1109/TAC.2023.3279209.

[6] W. Liang, **T. Grigoletto**, and F. Ticozzi. "Dissipative feedback switching for quantum stabilization". In: *Automatica* 165 (2024), p. 111659. DOI: 10.1016/j.automatica.2024.111659.

[7] **T. Grigoletto** and F. Ticozzi. "Exact Model Reduction for Discrete-Time Conditional Quantum Dynamics". In: *IEEE Control Systems Letters* (2024). DOI: 10.1109/LCSYS.2024.3399100.

[8] M. Cortese, **T. Grigoletto**, F. Ticozzi, and A. Ferrante. "Robust positive model reduction via monotone matrices". In: *IEEE Transaction on Automatic Control* (2025). DOI: 10.1109/TAC.2025.3569190.

Conference

[1] T. Benciolini, **T. Grigoletto**, and M. Zorzi. "Image compression by means of the multidimensional circulant covariance extension problem–Revisited". In: *2020 59th IEEE Conference on Decision and Control (CDC)*. IEEE. 2020, pp. 280–285. DOI: 10.1109/CDC42340.2020.9304228.

[3] **T. Grigoletto** and F. Ticozzi. "Minimal resources for exact simulation of quantum walks". In: *2022 IEEE 61st Conference on Decision and Control (CDC)*. 2022, pp. 5155–5160. DOI: 10.1109/CDC51059.2022.9993322.

[11] M. Peruzzo, **T. Grigoletto**, and F. Ticozzi. "Reconstructing Quantum States from Local Observation: A Dynamical Viewpoint". In: *2024 IEEE 63st Conference on Decision and Control (CDC)*. 2024. DOI: 10.1109/CDC56724.2024.10886855.

Under review

[5] **T. Grigoletto** and F. Ticozzi. *Model Reduction for Quantum Systems: Discrete-time Quantum Walks and Open Markov Dynamics*. 2023. URL: https://arxiv.org/abs/2307.06319.

[9] **T. Grigoletto**, Y. Tao, F. Ticozzi, and L. Viola. *Exact Model Reduction for Continuous-Time Open Quantum Dynamics*. 2024. URL: https://arxiv.org/abs/2412.05102.

[13] **T. Grigoletto**, C. Pellegrini, and F. Ticozzi. *Quantum model reduction for continuous-time quantum filters*. 2025. URL: https://arxiv.org/abs/2501.13885.

Other references

[10]   **T. Grigoletto**. "Exact model reduction for quantum systems". Ph.D. dissertation. University of Padua, 2024. URL: `https://hdl.handle.net/11577/3512417`.

[12]   **T. Grigoletto**, A. Gallina, and G. Pillonetto. *Applied Functional Analysis and Machine Learning*. Lecture notes. 2024.

Under preparation

[14]   **T. Grigoletto**, M. Burgelman, A. Sarlette, F. Ticozzi, and L. Viola. *An algebraic viewpoint on adiabatic model reduction*. In preparation.

[15]   **T. Grigoletto**, F. Ticozzi, and L. Viola. *Finding weak symmetries of open quantum systems through Riemannian gradient descent*. In preparation.

[16]   M. Peruzzo, **T. Grigoletto**, and F. Ticozzi. *Quantum dynamical tomography*. In preparation.

[17]   **T. Grigoletto**. *Time-ordered expansion for the derivation of time-convolutionless master equations*. In preparation.