

Tommaso Menara

PHD CANDIDATE · UNIVERSITY OF CALIFORNIA, RIVERSIDE

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Research Interest

- Systems and Network Neuroscience
- Synchronization Phenomena
- Network Control Theory
- Structural Properties of Control Systems

Education

University of California, Riverside

PHD IN MECHANICAL ENGINEERING

Riverside, CA, USA

2016 - present

University of Pisa

LAUREA MAGISTRALE (M.Sc. EQUIVALENT) IN ROBOTICS AND AUTOMATION ENGINEERING

Pisa, Italy

2013 - 2016

University of Padova

LAUREA (B.Sc. EQUIVALENT) IN MECHATRONICS ENGINEERING

Padova, Italy

2010 - 2013

Honors & Awards

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| 2020 | IEEE CSS 2020 Roberto Tempo Award , IEEE Conference on Decision and Control | Jeju Island, S. Korea |
| 2020 | Dissertation Year Program Award , University of California, Riverside | Riverside, USA |
| 2019 | Best Student Paper Award , American Control Conference | Philadelphia, USA |
| 2016 | Dean's Distinguished Fellowship , University of California, Riverside | Riverside, USA |

Publications

IN PREPARATION

- (P4) *Functional Control of Complex Oscillator Networks*
T. Menara, G. Baggio, D. S. Bassett, F. Pasqualetti
- (P3) *Relay Interactions Enable Remote Synchronization in Networks of Phase Oscillators*
T. Menara, Y. Qin, D. S. Bassett, F. Pasqualetti

PREPRINTS

- (P2) *Phase-Amplitude Coupling in Neuronal Oscillator Networks*
Y. Qin, **T. Menara**, D. S. Bassett, F. Pasqualetti
Available at: [arXiv:2012.04217](https://arxiv.org/abs/2012.04217)
- (P1) *Brain Network Dynamics Fingerprints Are Resilient to Data Heterogeneity*
T. Menara, G. Lisi, F. Pasqualetti, A. Cortese
<https://doi.org/10.1101/2020.01.26.920637>

JOURNAL PAPERS

- (J5) *Brain State Stability During Working Memory is Explained by Network Control Theory, Modulated by Dopamine D1/D2 Receptor Function, and Diminished in Schizophrenia*
U. Braun, A. Harneit, G. Pergola, **T. Menara**, A. Schaefer, R. F. Betzel, Z. Zang, J. I. Schweiger, K. Schwarz, J. Chen, G. Blasi, A. Bertolino, D. Durstewitz, F. Pasqualetti, E. Schwarz, A. Meyer-Lindenberg, D. S. Bassett, H. Tost
Nature Communications, In Press (accepted). ArXiv version available at [arXiv:1906.09290](https://arxiv.org/abs/1906.09290)

- (J4) *Conditions for Feedback Linearization of Network Systems*
T. Menara, G. Baggio, D.S. Bassett, F. Pasqualetti
 IEEE Control Systems Letters, 2020, vol. 4, no. 3, pp. 578-583, Jul 2020
- (J3) *Stability Conditions for Cluster Synchronization in Networks of Heterogeneous Kuramoto Oscillators*
T. Menara, G. Baggio, D.S. Bassett, F. Pasqualetti
 IEEE Transactions on Control of Network Systems, vol. 7, no. 1, pp. 302-314, Mar 2020
- (J2) *White Matter Network Architecture Guides Direct Electrical Stimulation Through Optimal State Transitions*
 J. Stiso, A. N. Khambhati, **T. Menara**, A. E. Kahn, J. M. Stein, S. R. Das, R. Gorniak, J. Tracy, B. Litt, K. A. Davis, F. Pasqualetti, T. Lucas, D. S. Bassett
 Cell Reports, vol. 28, no. 10, pp. 2554-2566, Sep 2019
- (J1) *Structural Controllability of Symmetric Networks*
T. Menara, D.S. Bassett, F. Pasqualetti
 IEEE Transactions on Automatic Control, vol. 64, no. 9, pp. 3740-3747, Sep 2019

CONFERENCE PROCEEDINGS

- (C6) *Conditions for Feedback Linearization of Network Systems*
T. Menara, G. Baggio, D.S. Bassett, F. Pasqualetti
 Presentation only, as part of IEEE L-CSS submission, Dec 2020
- (C5) *A Framework to Control Functional Connectivity in the Human Brain*
T. Menara, G. Baggio, D.S. Bassett, F. Pasqualetti
 Proceedings of the IEEE Conference on Decision and Control. Nice, France, Dec 2019, pp 4697-4704
2020 Roberto Tempo Award
- (C4) *Exact and Approximate Stability Conditions for Cluster Synchronization of Kuramoto Oscillators*
T. Menara, G. Baggio, D.S. Bassett, F. Pasqualetti
 Proceedings of the American Control Conference. Philadelphia, USA, Jul 2019, pp 205-210
Best Student Paper Award
- (C3) *The Structured Controllability Radius of Symmetric (Brain) Networks*
T. Menara, V. Katewa, D.S. Bassett, F. Pasqualetti
 Proceedings of the American Control Conference. Milwaukee, USA, Jun 2018, pp 2802-2807
- (C2) *On the Number of Strongly Structurally Controllable Networks*
T. Menara, G. Bianchin, M. Innocenti, F. Pasqualetti
 Proceedings of the American Control Conference. Seattle, USA, May 2017, pp 340-345
- (C1) *Procoagulant control strategies for the human blood clotting process*
 M. Laurino, **T. Menara**, A. Stella, M. Betta, A. Landi
 Proceedings of the Annual Conference of the IEEE Engineering in Medicine and Biology Society. Milan, Italy, Aug 2015, pp 4439-4442

Presentations

2020 July	E-Poster , International Conference on Mathematical Neuroscience	Virtual
2020 May	Talk , Mechanical Engineering Symposium. University of California, Riverside	UCR
2019 Sep	Talk , Kokusaino meeting. Advanced Telecommunications Research Institute International	Kyoto, Japan
2019 May	Talk , SoCal Control Workshop. University of Southern California	USC
2018 Nov	Poster , Computational Neuroimaging and Neuroengineering Symposium. University of California, Riverside	UCR
2018 Apr	Talk , Mechanical Engineering Symposium. University of California, Riverside	UCR
2016 Jun	Poster , Workshop on Brain Dynamics and Neurocontrol Engineering. Washington University in St. Louis	WUSTL

Teaching

2019 Fall **ME121**, Teaching assistant for the class *Feedback Control*

UCR

Professional Service

• Referee/Reviewer

- Journals: Elsevier NeuroImage, PLOS One, IEEE Transactions on Automatic Control (IEEE-TAC), IEEE Transactions on Control of Networked Systems (IEEE-TCNS), IEEE Control Systems Letters (IEEE L-CSS), IFAC Automatica, SIAM Journal on Control and Optimization (SICON). Elsevier European Journal of Control (EJCON). Springer Nonlinear Dynamics (NODY)
- Conferences: IEEE Conference on Decision and Control (CDC), American Control Conference (ACC), European Control Conference (ECC), International Conference on Control, Decision and Information Technologies (CoDIT), Conference on Control Technologies (CCTA), IFAC World Congress

- **Member of Societies**: Institute of Electrical and Electronics Engineers (IEEE), IEEE Control Systems Society (CSS), IEEE Brain Community, IEEE Young Professionals, IEEE CSS Technical Committee on Healthcare and Medical Systems (TC-HCMS), Society for Industrial and Applied Mathematics (SIAM), Network Science Society (NetSci).

Experience

Graduate Student Association

*HUB 203, 900 University Ave,
Riverside, CA, 92521, USA*

UNIVERSITY OF CALIFORNIA RIVERSIDE

Sep 2017 - Present

- *Public Relations Officer* (2018-2020): Responsible of organizing campus-wide social events. Management of the budget for social events, memorabilia, and public lectures
- *International Student Affairs Officer* (2017-2018): Monitoring of campus issues and legislative developments that affect international graduate students. Member of the standing committee for international education of the academic senate
- *Mechanical Engineering Representative* (2016-2017): voting member and representative for the department of mechanical engineering in the general graduate student council

HUB Governing Board

*900 University Ave, Riverside, CA,
92521, USA*

UNIVERSITY OF CALIFORNIA RIVERSIDE

Sep 2018 - Present

- *Chair* (2019-2020) and *Vice-Chair* (2018/2019): Member of the student governing board that controls the Highlander Union and reports to the Vice Chancellor of Student Affairs. The board develops all facility operations and usage policies, approves all budgetary aspects, and provides comment on HUB Programming, initiatives, operations, etc. In recognition for my services, my name is signed on the final steel beam of the newly constructed Student Success Center

Intern

*2-2-2 Hikaridai, Seika-cho,
Soraku-gun, Kyoto, Japan*

ADVANCED TELECOMMUNICATIONS RESEARCH INSTITUTE INTERNATIONAL (ATR)

July 2019 - October 2019

- Project on data-driven models for the analysis of multi-site resting-state fMRI datasets and the appraisal of neurofeedback treatments

References

- **Dr. Fabio Pasqualetti**, Associate Professor
Department of Mechanical Engineering, University of California, Riverside
☎ +1 (951) 827-2327 ✉ fabiopas@engr.ucr.edu 🏠 homepage
- **Dr. Danielle S. Bassett**, J. Peter Skirkanich Professor
Department of Bioengineering, University of Pennsylvania
☎ +1 (215) 746-1754 ✉ dsb@seas.upenn.edu 🏠 homepage
- **Dr. Jorge Cortés**, Professor
Department of Mechanical and Aerospace Engineering, University of California, San Diego
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