



Yuzhen Qin | Curriculum Vitae

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Dec. 2021

Current Employment

- University of California, Riverside (UCR) USA
Postdoctoral Researcher; advisor: Fabio Pasqualetti, Jan. 2020–present

Education

- University of Groningen (Rug) Netherlands
Ph.D. in Systems and Control; advisor: Ming Cao, Oct. 2015–Dec. 2019
- Wuhan University China
M.Eng. in Control Theory and Engineering, Sep. 2012–Jun. 2015
- Hohai University China
B.Eng. in Automation Engineering, Sep. 2008–Jun. 2012

Research Interests

- Modeling and Control of Coordinated Behaviors in the Brain
 - Goals:** Patterns of coordinated behaviors in the brain underlie various brain function. Pathological patterns are often biomarkers or even causes of brain disorders. In this line of research, we aim to: 1) model the brain by biologically plausible networked systems; 2) understand the mechanisms underlying different coordinated behaviors; 3) propose control strategies to regulate abnormal patterns with the goal to inform the design of better treatment for brain diseases.
 - Focus:** We mainly focus on cross-frequency *phase-amplitude coupling* and *cluster synchronization* in the brain since they are associated with brain disorders such as Parkinson's, epilepsy, and tremor.
- Multitask Representation Learning for Sequential Decision-Making
Humans naturally excel at organizing past experience into simpler representations (low-dimensional structures) that can be used to construct new strategies efficiently in future complex environments. Motivated by this, we exploit representation learning in sequential decision-making scenarios.
- Other interests
Control of networked systems, stability analysis of slow-fast systems and stochastic systems, modeling and analysis of behaviors in social networks

Presentations

- Poster, ICML Workshop on Reinforcement Learning Theory, virtual, 2021
- Talk, the 59th IEEE Control and Decision Conference, virtual, 2020
- Talk, the 57th IEEE IEEE Control and Decision Conference, Miami Beach, FL, USA, 2018
- Talk, IEEE European Control Conference, Limassol, Cyprus, 2018
- Talk, the 36th Benelux Meeting on Systems and Control, Spa, Belgium, 2018
- Talk, the 20th IFAC Congress, Toulouse, France, 2017
- Talk, the 35th Benelux Meeting on Systems and Control, Soesterberg, the Netherlands, 2017

Teaching

Teaching Assistant

Modelling and Analysis of Complex Networks, course code TBMACN-11,

University of Groningen

Feb. 2016-Apr. 2019

Publications

Under Review

- [R4] **Y. Qin**, D. S. Bassett, F. Pasqualetti, "Vibrational Control of Cluster Synchronization: Connections with Deep Brain Stimulation", the 61th IEEE Conference on Decision and Control, 2022, submitted.
- [R3] **Y. Qin**, D. S. Bassett, F. Pasqualetti, "Flexible Information Propagation in Oscillator Networks", the 61th IEEE Conference on Decision and Control, 2022, submitted.
- [R2] **Y. Qin**, T. Menara, S. Oymak, S. Ching, F. Pasqualetti. "Non-Stationary Representation Learning in Sequential Linear Bandits", *IEEE Open Journal of Control Systems*, under review.
- [R1] O. Portoles, **Y. Qin**, J. Hadida, M. Woolrich, Ming Cao, M. van Vugt, "Fluctuations of local synchrony lead to resting-state alpha-band-envelope connectivity in a parsimonious large-scale brain model", *PLOS ONE*, under review.

Selected Peer-Reviewed Journal Papers

- [J8] **Y. Qin**, Y. Kawano, M. Cao, and B. D. O. Anderson. "Partial exponential stability analysis of slow-fast systems via periodic averaging." *IEEE Transactions on Automatic Control*, DOI: 10.1109/TAC.2021.3117151.
- [J7] T. Menara, **Y. Qin**, D. S. Bassett, and F. Pasqualetti "Relay interactions enable remote synchronization in networks of phase oscillators", *IEEE Control Systems Letters*, 6:500-505, 2022.
- [J6] **Y. Qin**, T. Menara, D. S. Bassett, and F. Pasqualetti, "Phase-amplitude coupling in neuronal oscillator networks", *Physical Review Research*, 3.2: 023218, 2021.
- [J5] Y. Zhai, Z.W. Liu, M. Fe Ge, G. Wen, X. Yu, and **Y. Qin**, "Trusted-region subsequence reduction for designing resilient consensus algorithms", *IEEE Transactions on Network Science and Engineering*, vol. 8, no. 1, pp. 259-268, 2021
- [J4] **Y. Qin**, Y. Kawano, O. Portoles and M. Cao. "Partial phase cohesiveness in networks of networks of Kuramoto oscillators." *IEEE Transactions on Automatic Control*, vol. 66, no. 12, pp. 6100-6107, 2021.
- [J3] **Y. Qin**, M. Cao, B. D.O. Anderson, D. S. Bassett, and F. Pasqualetti, "Mediated remote synchronization of Kuramoto-Sakaguchi oscillators: the number of mediators matters", *IEEE Control Systems Letters*, 5(3): 767-772, 2020.
- [J2] **Y. Qin**, M. Cao, and B. D. O. Anderson, "Lyapunov criterion for stochastic systems and its applications in distributed computation." *IEEE Transactions on Automatic Control*, vol. 65, no.2, pp. 546-560, 2019.
- [J1] M. Ye, **Y. Qin**, A. Govaert, B. D. O. Anderson, and M. Cao. "An influence network model to study discrepancies in expressed and private opinions," *Automatica*, 107: 371-381, 2019.

Selected Peer-Reviewed Conference Papers

- [C5] **Y. Qin**, T. Menara, S. Oymak, S. Ching, and F. Pasqualetti, "Representation Learning for Context-Dependent Decision-Making", 2022 American Control Conference, to appear.
- [C4] **Y. Qin**, Y. Kawano, and M. Cao, "Stability of remote synchronization in star networks of Kuramoto oscillators," in Proceeding of the 57th IEEE Conference on Decision and Control, Miami Beach, FL, USA, 2018.
- [C3] **Y. Qin**, Y. Kawano, and M. Cao, "Partial phase cohesiveness in networks of communitinized Kuramoto oscillators," in Proceeding of IEEE European Control Conference, Limassol, Cyprus, 2018, pp. 2028-2033.
- [C2] A Govaert, **Y. Qin**, and M. Cao. "Necessary and sufficient conditions for the existence of cycles in evolutionary dynamics of two-strategy games on networks," in Proceeding of IEEE European Control Conference, Limassol, Cyprus, 2018, pp. 2182-2187.
- [C1] **Y. Qin**, M. Cao, and B. D. O. Anderson, "Asynchronous agreement through distributed coordination

algorithms associated with periodic matrices,” in Proceeding of the *20th IFAC World Congress*, Toulouse, France, 2017, 50(1): 1742-1747.

Peer-Reviewed Extended Abstract

- [A1] **Y. Qin**, T. Menara, S. Oymak, S. Ching, F. Pasqualetti. “Non-Stationary Representation Learning in Sequential Multi-Armed Bandits”, *ICML Workshop on Reinforcement Learning Theory*, virtual 2021.

Professional Services

Reviewer:

- **Journals:** IEEE Transactions on Automatic Control; Automatica; Systems and Control Letters; IEEE Transactions on Industrial Electronics; IEEE Transactions on Systems, Man and Cybernetics; IEEE Control Systems Letters, *etc.*
- **Conferences:** IEEE Conference on Decision and Control (CDC); American Control Conference (ACC); European Control Conference (ECC).

Membership:

Institute of Electrical and Electronics Engineers (IEEE), IEEE Control Systems Society (CSS)

Languages

- **English**, professional working proficiency (CEFR C1/C2)
- **Chinese**, native