

# Qinglong Gu

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## Position

2018-Now **Postdoctoral Associate**  
Yale University, Department of Psychiatry, Murray Lab

## Education

2013-2018 **Ph.D. in Mathematics**  
2011-2013 **M.S. in Mathematics**,  
Shanghai Jiao Tong University, China  
*Advisors:* **Prof. David Cai** and **Prof. Douglas Zhou**  
*Dissertation:* “Balanced state in neuronal networks”.  
2007-2011 **B.S. in Mathematics**  
Shanghai Jiao Tong University, China

## Awards

2018-2020 **Swartz Fellowship**, Yale University  
2013 **National Scholarship**, Ministry of Education, China  
*The highest honorific scholarship awarded by the Chinese government for excellence in research*  
2011-2013 **Excellent Academic Scholarship( first-class)**, Shanghai Jiao Tong University  
*The scholarship awarded by SJTU for top 5% student in each department*

## Publications

- 2020 **Qinglong Gu**, Norman H. Lam, Michael M. Halassa, John D. Murray, **Circuit Mechanisms of Top-Down Attentional Control in a Thalamic Reticular Model** (*In Review*). *bioRxiv* 10.1101/2020.09.16.300749
- 2019 **Qinglong Gu**, Songting Li, Douglas Zhou and David Cai, **Emergence of spatially periodic diffusive waves in small-world neuronal networks**. *Physical Review E*
- 2019 **Qinglong Gu**, Songting Li, Wei Dai, Douglas Zhou and David Cai, **Balanced Active Core in Heterogeneous Neuronal Networks**. *Frontiers in Computational Neuroscience*
- 2018 **Qinglong Gu**, Zhongqi Tian, Douglas Zhou and David Cai, **The Dynamics of Balanced Spiking Neuronal Networks Under Poisson Drive Is Not Chaotic**. *Frontiers in Computational Neuroscience*

## Work in Preparing

\*=equal contributions

- 2020 **Qinglong Gu\***, Norman H. Lam\*, John D. Murray. *A Dendritic-Inhibition Circuit Model for Working Memory*.

- 2020 **Qinglong Gu**, John D. Murray. *A Dynamical Systems Perspective on Thalamic Circuit*. Book chapter in press.
- 2020 Daming Li\*, **Qinglong Gu\***, John D. Murray. *Modeling the causal effect of locus coeruleus neuromodulation on brain dynamics*.

## Ongoing work presented at conferences

- 02/2020 *Mechanisms of top-down attentional control in thalamic reticular circuits* (poster), Cosyne, USA, Feb-Mar, 2020
- 10/2019 *Mechanisms of top-down attentional control in thalamic reticular circuits and effects of inhibitory dysfunction* (poster), SfN, Snowbird, Chicago, USA, Oct, 2019
- 05/2017 *Emergence of a balanced core through dynamical computation in inhomogeneous neuronal networks*, SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, USA, May, 2017
- 11/2016 *Emergence of a balanced core through dynamical computation in inhomogeneous neuronal networks*, the 12th conference on Computational Sciences and Engineering, Shanghai, China, Nov, 2016
- 08/2016 *Balanced state in scale-free neuronal networks*, SIAM Conference on Nonlinear Waves and Coherent Structures, Philadelphia, USA, Aug, 2016
- 05/2016 *Balanced state in scale-free neuronal networks*, Mathematical Sciences Department, Rensselaer Polytechnic Institute, Mar, 2016
- 11/2015 *Balanced state in scale-free neuronal networks*, the 11th conference on Computational Sciences and Engineering, Shanghai, China, Nov, 2015

## Research Interests

Properties of balanced neuronal networks, Dynamical systems,  
Thalamic circuits, Large-scale modeling, Computational psychiatry

## Academic Experience

- 2019 Post graduate, Yale University, USA, Sep, 2019
- 2017 Student, Computational and Cognitive Neuroscience Summer School, *Cold Spring Harbor Asia*. July, 2017
- 2016-2017 Visiting Researcher, Courant Institute at New York University, USA, Jan-May, 2016; Jan-May, 2017
- 2014-2016 Visiting Researcher, New York University Abu Dhabi, UAE, Feb-Mar, 2014; Feb-Mar & Aug-Sep, 2015; Aug-Sep 2016

## Teaching

- 2020 Neuromatch Academy, online  
Teaching assistant. Developed tutorials of “Real Neurons” and “Dynamic Networks”.
- 2019 Computational and Cognitive Neuroscience Summer School, Suzhou, China  
Teaching assistant. Developed tutorials of “Decision Making & Attractor Model” and “Large scale brain model”. Advised students *Wen Jin*, *Dian Lu* and *Xingjian Chu* on their projects.
- 2015 Calculus, Shanghai Jiao Tong University, Shanghai, China  
Teaching assistant
- 2014 Numerical Methods, Shanghai Jiao Tong University, Shanghai, China  
Teaching assistant

2013 Probability and Statistics , Shanghai Jiao Tong University, Shanghai, China  
Teaching assistant

## Research Mentorship

2019-now Daming Li, graduate student in the group of Prof. John Murray.

2019 Computational and Cognitive Neuroscience Summer School project supervision:

Wen Jin, Shanghai Jiao Tong University, "Robustness of model fitting for large-scale brain dynamics"

Dian Lu, University of Cambridge, "Effect of Propofol on Large-scale model"

Xingjian Chu, University of Science and Technology of China, "What's the Mechanism underlying Initial Condition Dependent RNN"

2015-2016 Zhongqi Tian, graduate student in the group of Prof. David Cai.

## Professional Affiliations

(**Cosyne**) Member of Computational and Systems Neuroscience

(**SfN**) Member of Society for Neuroscience

(**SIAM**) Member of Society for Industrial and Applied Mathematic

(**CNS**) Member of Chinese Neuroscience Society