

## EDUCATION

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- University of California, San Diego** La Jolla, USA  
Ph.D. in Cognitive Science, Advisor: Bradley Voytek September 2014–October 2020  
– Thesis: “Bridging cognition and neurobiology with large-scale cortical dynamics and multimodal brain data.”
- The CAJAL Advanced Neuroscience Training Programme** Lisbon, Portugal  
Computational Neuroscience August 10–31, 2019
- Redwood Center for Theoretical Neuroscience** Berkeley, USA  
CRCNS Course on Mining and Modeling of Neuroscience Data July 9–20, 2015
- University of Toronto** Toronto, Canada  
BASc in Engineering Science (Biomedical Engineering), GPA: 3.90/4.00 September 2009–June 2014  
– Thesis: “Designing closed-loop electrical stimulation system for treatment of intractable epilepsy.”

## PROFESSIONAL EXPERIENCE

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- University of California, San Diego** La Jolla, USA  
Graduate Writing Consultant, Teaching & Learning Commons January 2019–March 2020  
– Conducted one-on-one consultation sessions with PhD students of all disciplines on writing projects (including journal manuscripts, fellowship/grant proposals, cover letters, etc.), with special emphasis on high-level concerns, clarity, and structural organization. Received training on peer-mentoring and postgraduate writing.
- InteraXon Inc.** Toronto, Canada  
Research Associate (BASc Degree Professional Internship) July 2012–August 2013  
– Developed EEG-based brain-computer interface (BCI) algorithms for mindfulness meditation neurofeedback training. Programmed in MATLAB, Python, and Processing.js. Conducted user-research studies with real-time visual and audio feedback.

## AWARDS, FELLOWSHIPS, AND GRANTS

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- Boehringer Ingelheim Fonds PhD Travel Grant: \$3,000 2019
- Kavli Institute for Brain and Mind, Innovative Research Grant: \$50,000 2017–2018
- NSERC Postgraduate Scholarship-Doctoral: \$21,000/year 2016–2019
- NSERC Alexander Graham Bell Canada Graduate Scholarship (Declined) 2016
- Cosyne 2016 Travel Grant 2016
- UCSD Frontiers of Innovation Scholar Program Research Grant: \$25,000 2015–2016
- UCSD Katzin Fellowship: \$10,000/year 2015–2019
- University of Toronto Engineering Science Award of Excellence (for GPA  $\geq 3.9/4.0$ ) 2014
- NSERC Industrial Undergraduate Student Research Award: \$6000 2012–2013
- Undergraduate Student Research Award: \$6000 2011

## PUBLICATIONS & PREPRINTS

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1. **Gao, R.**, van den Brink, R. L., Pfeffer, T., & Voytek, B. (2020). Neuronal timescales are functionally dynamic and shaped by cortical microarchitecture. *eLife*, 9, e61277.
2. Donoghue, T., Haller, M., Peterson, E. J., Varma, P., Sebastian, P., **Gao, R.**, Noto, T., Lara, A. H., Wallis, J. D., Knight, R. T., Shestyuk, A., & Voytek, B. (2020). Parameterizing neural power spectra into periodic and aperiodic components. *Nature Neuroscience*, 23(12), 1655–1665.
3. Ghatak, S., Dolatabadi, N., **Gao, R.** et al. NitroSynapsin ameliorates hypersynchronous neural network activity in Alzheimer hiPSC models. *Mol Psychiatry* (2020).
4. Trujillo, C. A.\* , **Gao, R.\***, Negraes, P. D.\* , et al. (2019) Complex oscillatory waves emerging from cortical organoids model early human brain network development. *Cell Stem Cell*, 25(4) 558-69.
5. Cole, S, Donoghue, T., **Gao, R.**, Voytek, B. (2019) NeuroDSP: A package for neural digital signal processing. *Journal of Open Source Software*, 4(36), 1272, <https://doi.org/10.21105/joss.01272>
6. Núñez, R., Allen, M., **Gao, R.**, Rigoli, C.M., Relaford-Doyle, J., Semenuks, A. (2019). What happened to cognitive science. *Nature Human Behavior*, 3(8), 782-91.
7. Moore, S. M., Seidman, J. S., Ellegood, J., **Gao, R.**, Savchenko, A., Troutman, T. D., et al. (2019). Setd5 haploinsufficiency alters neuronal network connectivity and leads to autistic-like behaviors in mice. *Translational Psychiatry*, 9(1), 24.
8. **Gao, R.**, Peterson, E. J. & Voytek, B. (2017). Inferring synaptic excitation/inhibition balance from field potentials. *Neuroimage* 158, 70–78.
9. **Gao, R.** (2016). Interpreting the electrophysiological power spectrum. *Journal of Neurophysiology* 115, 628–630.

## PEER-REVIEWED CONFERENCE PAPERS

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1. **Gao, R.**, Christiano, D., Donoghue, T., Voytek, B. (2019). The structure of cognition across computational cognitive neuroscience. *Cognitive Computational Neuroscience (CCN)*. Poster.
2. **Gao, R.**, Voytek., B. (2019). Hierarchy of cortical population characteristic timescales inferred from field potentials. *Computational and Systems Neuroscience (Cosyne)*. Poster.
3. **Gao, R.**, Liao, L., Voytek, B. (2018). Spectral power variation separates oscillatory from non-oscillatory stochastic neural dynamics. *Cognitive Computational Neuroscience (CCN)*. Poster.
4. **Gao, R.**, Donoghue, T., Voytek, B. (2018) Defining Cognition: cognitive ontology via text-mining and word-embedding. *Cognitive Neuroscience Society (CNS) Annual Meeting*. Poster.
5. **Gao, R.**, Donoghue, T., Voytek., B. (2017). Automated generation of cognitive ontology via web text-mining. *CogSci Annual Meeting Proceedings*, 2067-72
6. **Gao, R.**, Voytek, B. (2016). Inferring excitatory and inhibitory synaptic parameters from the local field potential. *Computational and Systems Neuroscience (Cosyne)*. p.103. Poster.

## SCIENCE COMMUNICATION & BLOG ARTICLES

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1. See [www.rdgao.com/blog](http://www.rdgao.com/blog)
2. Waschke, L., **Gao, R.** (2019). The Magical Number 3. *Nature Human Behavior*, <https://socialsciences.nature.com/posts/54636-the-magical-number-3>
3. **Gao, R.** (2019). Searching for the Hidden Factors Underlying the Neural Code. *Simons Collaboration Global Brain*, <https://www.simonsfoundation.org/2019/07/31/searching-for-the-hidden-factors-underlying-the-neural-code/>

## TEACHING

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- **Lead Teaching Assistant** at NeuroMatch Academy Summer, 2020  
*Computational Neuroscience & Machine Learning (NMA2020)*
- **Instructor on Record** at University of California, San Diego Summer Session I, 2019  
*Neural Signal Processing (COGS118C)* - <https://github.com/rdgao/cogs118c>
- **Graduate Seminar Co-Organizer** at University of California, San Diego Spring 2018  
*Representation in the Mind (COGS200)*
- **Teaching Assistant** at University of California, San Diego Fall 2018, Fall 2017  
*Introduction to Data Science (COGS9)*
- **Teaching Assistant** at University of California, San Diego Fall 2016, Winter 2015  
*Introduction to Cognitive Science (COGS1)*
- **Teaching Assistant** at University of California, San Diego Spring 2015  
*Introduction to Statistical Analysis (COGS14B)*
- **Teaching Assistant** at University of California, San Diego Fall 2015  
*Intro to Machine Learning II. (COGS118B)*
- **Teaching Assistant** at University of Toronto Fall 2014  
*Praxis I. Engineering Design (ESC101)*

## MENTORSHIP

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- **Brian Barry**, UCSD Cognitive Science 2019–Present
- **Lucas Henry**, UCSD Cognitive Science 2019–Present
- **Christopher Caligiuri**, Canyon Crest Academy Highschool 2017–Present
- **Adrianna Hohil**, UCSD Cognitive Science 2019
- **Lauren Liao**, UCSD Mathematics (Probability & Statistics) 2016–2019  
now Masters in Biostatistics at UC Berkeley; UCSD CRES Undergraduate Research Award
- **Dylan Christiano**, UCSD Cognitive Science 2017–2018  
now Lab Manager at Stanford University;
- **Sitan (Stan) Liu**, UCSD Exchange student from Sichuan University 2017
- **Tanner Turner**, UCSD Applied Mathematics & Computer Science 2016-2017

## REVIEW SERVICES

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- **eLife** 1 time, 2020
- **Neuropsychopharmacology** 1 time, 2020
- **Journal of Neuroscience** 3 times, 2018-2020
- **NeuroImage** 2 times, 2017, 2020
- **Neurons, Behavior, Data Analysis, and Theory** 1 time, 2019
- **PLOS Computational Biology** 3 times, 2018,2020
- **Journal of Cognitive Neuroscience** 1 time, 2017

## FAILURES AND REJECTIONS

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### Papers:

- Gao et al., 2020, BioRxiv 5 Editorial rejections
- Gao et al., 2017, NeuroImage 4 Editorial rejections, 2 after Review Round 1
- Trujillo, Gao, Negraes et al., 2019, Cell Stem Cell 1 Editorial rejections, 4 after Review Round 1
- Gao et al., 2015, J Neurophysiology 3 Editorial rejections

### Grants:

- JSMF Postdoctoral Fellowship Awards 2020
- UCSD KIBM IRG 2020, 2019, 2015
- NSERC PGS-D 2015

### Conferences, Workshops Summer Schools:

- Cosyne 2018
- FENS CAJAL Computational Neuroscience 2018
- Okinawa Computational Neuroscience 2017
- UW / Allen Brain Institute Dynamic Brain Workshop 2018, 2016
- Woods Hole 2016