

Scott R. Cole
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<https://srcole.github.io>

Education

Ph.D. Student in Neuroscience
University of California, San Diego
GPA: 3.9/4.0

2014 - Present
La Jolla, CA

B.S. in Bioengineering, Electrical Engineering Specialization, Mathematics minor
Clemson University
GPA: 4.0/4.0

2010 - 2014
Clemson, SC

Publications

1. **Cole SR**, van der Meij R, Peterson EJ, de Hemptinne C, Starr P, Voytek B. (2017) Nonsinusoidal oscillations underlie pathological phase-amplitude coupling in the motor cortex in Parkinson's disease. *Journal of Neuroscience*, 37(18) 4830-4840. [[link](#)]
2. **Cole SR**, Voytek B (2017). Brain oscillations and the importance of waveform shape. *Trends in Cognitive Sciences*, 21(2), 137-149. [[link](#)]
3. Mohammed FS, **Cole SR**, Kitchens CL (2013). Synthesis and Enhanced Colloidal Stability of Cationic Gold Nanoparticles using Polyethyleneimine and Carbon Dioxide. *ACS Sustainable Chem. Eng.*, 1(7), 826-832. [[link](#)]

Presentations

1. **Cole SR**, Voytek B. The waveform shape of brain oscillations. *UCSD Neurosciences Graduate Program Research rounds*. San Diego, CA. 2017 May. [[link](#)]
2. **Cole SR**. Burritos are 10 dimensional. *Ignite San Diego*, San Diego, CA. 2017 May. [[YouTube TBD](#)]
3. **Cole SR**. Using Python and Fabric for analyzing brain signals on OSG connect. *Open Science Grid (OSG) All Hands Meeting 2017*, San Diego, CA. 2017 Mar. [[link](#)]
4. **Cole SR**, Peterson EJ, de Hemptinne C, Starr P, Voytek B. Deep brain stimulation changes the shape of motor cortical beta oscillations in Parkinson's Disease. *Cognitive Neural Systems (CNS) Seminar Series*, San Diego, CA. 2015 Nov. [[link](#)]
5. **Cole SR**, Steele TWJ. Biodegradable elastomers for targeted drug delivery applications. *Society for Biomaterials symposium*, Clemson, SC. 2012 Sep.

Posters

1. **Cole SR**, Voytek B (2017). Brain oscillations and the importance of waveform shape. *Edmond and Lily Safra Center for Brain Sciences at the Hebrew University of Jerusalem - Annual retreat*, Ein Gedi, Israel. 2017 Jan. [[link](#)]
2. **Cole SR**, Voytek B. The nonsinusoidal features of neural oscillation waveforms contain physiological information. *Society for Neuroscience (SfN) Annual meeting*, San Diego, CA. 2016 Nov. [[link](#)]
3. **Cole SR**, Peterson EJ, de Hemptinne C, Starr P, Voytek B. Deep brain stimulation changes the shape of motor cortical beta oscillations. *Society for Neuroscience (SfN) Annual meeting*, Chicago, IL. 2015 Oct. [[link](#)]
4. Noto T, **Cole SR**, Gao R, Peterson EJ, Voytek B. Neural network properties can be inferred from electrophysiological power spectral geometry. *Society for Neuroscience (SfN) Annual meeting*, Chicago, IL. 2015 Oct.
5. Thielk M, **Cole SR**, Sharpee T, Gentner TQ. Neural representation of morphed motifs in European Starling NCM. *MURI Winter School: Dynamics of multifunction brain networks*, San Diego, CA. 2015 Jan.
6. **Cole SR**, Voytek B. Effect of noise on a pulse-coupled neural network with phase-amplitude coupling. *Center for Science of Information Summer School*, San Diego, CA. 2014 Aug. [[link](#)]
7. **Cole SR***, Mason JI*, Lestrangle SJ, Alvarez TL. Effects of stereoscopic vision training on the vergence system of binocularly normal subjects. *Biomedical Engineering Society Annual Meeting*, Seattle, CA. 2013

Sep.

8. **Cole SR**, Dean D, Kitchens CL. Synthesis and cytotoxicity of one step synthesis cationic gold nanoparticles. *Biomedical Engineering Society Annual Meeting*, Seattle, CA. 2013 Sep.
9. **Cole SR**, Mohammed FS, Kitchens CL. Synthesis, characterization, and the effect of carbon dioxide on polytheleneimine-capped gold nanoparticles. *International Conference of Young Researchers on Advanced Materials*, Singapore. 2012 Jul.
10. **Cole SR**, Mohammed FS, Kitchens CL. Synthesis of gold and silver nanoparticles functionalized with polyethyleneimine. *Society for Biomaterials symposium*, Clemson, SC. 2011 Oct.

Open-Access Software

Cole SR. (2016). Misshapen: A library for measuring the waveform shape of neural oscillations. *Python*.

<https://github.com/voytekresearch/misshapen>

Cole SR & Peterson EJ. (2015). Pacpy: A library for calculating phase-amplitude coupling. v1.0.3. *Python*.

<https://pypi.python.org/pypi/pacpy/>

Scholarships & Grants

[Frontiers of Innovation Scholars Program](#) - University of California, San Diego (\$25,000) 2017

[Graduate Research Fellowship - National Science Foundation](#) (\$138,000) 2014-2017

[Barry M. Goldwater Scholarship](#) (\$7,500) 2013

Travel grants

Conference financial aid - SciPy, Austin, TX 2017

Retreat travel scholarship - Edmond and Lily Safra Center for Brain Sciences, Jerusalem, Israel 2017

Conference travel grant - Neurosciences Education and Research Foundation, San Marcos, CA 2016

Conference gravel grant - Calhoun Honors College, Clemson University 2012, 2013

Educational enrichment travel grant - Calhoun Honors College, Clemson University 2012

Honors & Awards

Faculty Scholarship Award - Clemson University 2014

Poly-Med Outstanding Senior Award - Clemson University Bioengineering Department 2014

Larry S. Bowman Outstanding Junior Award - Clemson University Bioengineering Department 2013

1st Place Undergraduate Oral Presentation - Society for Biomaterials Symposium, Clemson University 2012

S. W. Shalaby Outstanding Sophomore Award - Clemson University Bioengineering Department 2012

2nd Place, National Accounting competition - Future Business Leaders of America 2009

Academic Activities

Teaching

Clustering. Lecture. UCSD, Data Science in Practice ([Lecture](#), [Slides](#)) May 2017

Filtering neural signals and processing oscillation amplitude, Lecturer, UCSD,
Data Science in Practice ([Jupyter Notebook](#)) May 2017

Filtering neural signals and processing oscillation amplitude. Lecture. UCSD,
Fundamentals of statistics and computation for neuroscientists ([Lecture](#), [Materials](#)) May 2016

Calculating phase and coherence in neural signals. Lecture. UCSD,
Fundamentals of statistics and computation for neuroscientists ([Lecture](#), [Materials](#)) May 2016

Neural signal processing. Teaching assistant. UCSD, COGS 160/260 (prof Eran Mukamel) Mar-Jun 2016

MATLAB crash course, neural decoding workshop, & neural oscillations special project.

Teaching assistant. UCSD, Neurosciences Graduate Program Bootcamp Sep 2015, 2016

Electrical Engineering & Mathematics tutor - Clemson University Academic Success Center 2012-2014

Mentoring

Andrew Washington – undergraduate researcher, neural oscillation analysis Feb 2017-present

Yimeng Yang – undergraduate researcher, neural oscillation analysis Jan 2017-present

Pamela Riviere – PhD rotation student, neural oscillation analysis Apr-Jun 2017

Robert Loughnan – PhD rotation student, neural oscillation analysis	Jan-Mar 2017
Ryan Golden – PhD rotation student, neural network modeling	Sep-Dec 2016
Katie McGreevey - summer researcher, nanoparticle synthesis	Jul-Aug 2011

Professional Workshops

Edmond & Lily Safra Center for Brain Sciences (ELSC) Annual Retreat - Hebrew University of Jerusalem, Ein Gedi, Israel	Jan 2017
Computational approaches to Memory and Plasticity (CAMP) - National Centre for Biological Sciences (NCBS), Bangalore, India	Jul 2016
Open Science Grid (OSG) User School – University of Wisconsin, Madison	Jul 2016

Peer review

eLife (1 article)	2015
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Membership

Society for Neuroscience (SfN)	2014-present
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Campus involvement

Undergraduate research opportunities outreach (APAMSA, CfN, CSSA, BMES)	2016-present
Neuroscience education outreach - UCSD Neurosciences Graduate Program	2015-present
Computational neuroscience committee - UCSD Neurosciences Graduate Program	2014-present
Undergraduate Clemson Bioengineering Society - President	2011-2014

Media coverage

<i>Linux Journal</i> , Preparing data for machine learning (link)	Apr 2017
<i>Open Science Grid</i> , Free supercomputing for research (link)	Feb 2017
<i>American Chemical Society, Chemical & Engineering News</i> , Scientific searches for dragon's blood and the perfect burrito (link)	Oct 2016
<i>Canadian Broadcast Corporation (CBC) Radio</i> , Criteria for a quality burrito (link)	Sep 2016
<i>San Diego Union-Tribune</i> , PhD student identifies the 10 dimensions of burrito perfection (link)	Sep 2016
<i>Partially Derivative</i> data science podcast, The quantified burrito (link)	May 2016
<i>FOX Carolina</i> , \$40K made in currency market by tracking social media (link)	May 2012