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

Education

Ph.D. Candidate in Neuroscience — 2014 - Present
University of California, San Diego — La Jolla, CA
GPA: 3.9/4.0

B.S. in Bioengineering, Electrical Engineering specialization, Math minor — 2010 - 2014
Clemson University — Clemson, SC
GPA: 4.0/4.0

Publications

1. **Cole SR**, Voytek B. (2018) Cycle by cycle analysis of neural oscillations. *bioRxiv*. In review at *PLOS Computational Biology*. [link, code]
2. **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, code and data]
3. **Cole SR**, Voytek B. (2017) Brain oscillations and the importance of waveform shape. *Trends in Cognitive Sciences, 21*(2), 137-149. [link]
4. 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. Cycle by cycle analysis of neural oscillations. Society for Neuroscience (SfN) Annual meeting. San Diego, CA. 2018 Nov. [link TBD]. *Symposium Organizer
2. **Cole SR**, Voytek B. Brain oscillations and the importance of waveform shape. *International Conference on Biomagnetism (BIOMAG)*. Philadelphia, PA. 2018 Aug. [link]
3. **Cole SR**. Burritos are 10 dimensional. *Ignite San Diego*, San Diego, CA. 2017 May. [link]
4. **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]
5. **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]
6. **Cole SR**, Steele TWJ. Biodegradable elastomers for targeted drug delivery applications. *Society for Biomaterials symposium*, Clemson, SC. 2012 Sep.

Posters

1. Jackson N, **Cole SR**, Voytek B, Swann NC. Characteristics of beta waveform shape in Parkinson's disease detected with scalp EEG. *Society for Neuroscience (SfN) Annual meeting*, San Diego, CA. 2018 Nov.
2. **Cole SR**. Burritos of San Diego: 10-dimensional analysis. *UCSD Neurosciences Graduate Program Retreat*. Lake Arrowhead, CA. 2018 May. [link, code]
3. Yang Y, **Cole SR**, Gilja V, Voytek B. Decoding finger movement from neural signals using brain oscillation symmetry. *National Cognitive Science Conference*, San Diego, CA. 2018 Apr.
4. **Cole SR**, Voytek B. Waveform shape of hippocampal theta oscillations reflects interneuron spike timing. *Society for Neuroscience (SfN) Annual meeting*, Washington, DC. 2017 Nov. [link]
5. **Cole SR**, Voytek B. 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]
6. **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]

7. **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]
8. 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.
9. 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.
10. **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]
11. **Cole SR***, Mason JI*, Lestrange 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. *contributed equally
12. **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.
13. **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.
14. **Cole SR**, Mohammed FS, Kitchens CL. Synthesis of gold and silver nanoparticles functionalized with polyethyleneimine. *Society for Biomaterials symposium*, Clemson, SC. 2011 Oct.

Open-source packages

Cole SR. (2018). Bycycle: Cycle-by-cycle analysis of neural oscillations. *Python*. https://github.com/voytekresearch/bycycle

Voytek Lab. (2017). Neurodsp: A toolbox for analyzing oscillations in neural time series. *Python*. https://github.com/voytekresearch/neurodsp

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

Halıcıoğlu Data Science Institute Data Science Research Fellowship - UC San Diego ($3,000; mentor) 2018
Chancellor's Research Excellence Scholarships - University of California, San Diego ($3,000; mentor) 2018
Frontiers of Innovation Scholars Program - University of California, San Diego ($25,000; lead researcher) 2017
Graduate Research Fellowship - National Science Foundation 2014-2017
Barry M. Goldwater Scholarship 2013

Travel grants

Conference financial aid - SciPy, Austin, TX 2017
Conference travel grant - Neurosciences Education and Research Foundation, San Marcos, CA 2016
Conference travel grant - Calhoun Honors College, Clemson University 2012, 2013
Educational enrichment travel grant - Calhoun Honors College, Clemson University 2012

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
Jenny Hamer – undergraduate research, neural oscillation analysis Apr 2018-present
Sunny Pasumarthi – undergraduate research, neural oscillation analysis Feb 2018-present
Yimeng Yang – undergraduate research, neural oscillation analysis, machine learning Jan 2017-present
Andrew Washington – undergraduate research, neural oscillation analysis Feb 2017-Jun 2018
Pam Riviere – PhD rotation, neural oscillation analysis Apr-Jun 2017
Rob Loughnan – PhD rotation, neural oscillation analysis Jan-Mar 2017
Ryan Golden – PhD rotation, neural network modeling Sep-Dec 2016
Katie McGreevey - summer research, nanoparticle synthesis Jul-Aug 2011

Professional Workshops
Neurohackademy - Seattle Aug 2018
PyData NYC - New York Nov 2017
SciPy - Austin Jul 2017
Edmond & Lily Safra Center for Brain Sciences (ELSC) Annual Retreat - Ein Gedi, Israel Jan 2017
Computational approaches to Memory and Plasticity (CAMP) - NCBS, Bangalore, India Jul 2016
Open Science Grid (OSG) User School - University of Wisconsin, Madison Jul 2016

Peer review 2015-present
NeuroImage (x2), eLife, Nature Neuroscience, Brain Topography

Membership
Society for Neuroscience (SfN) 2014-present
Undergraduate Clemson Bioengineering Society - President 2011-2014

Media
Open Science Grid, Free supercomputing for research (link) Feb 2017
Canadian Broadcast Corporation (CBC) Radio, Criteria for a quality burrito (link) Sep 2016
San Diego Union-Tribune, PhD student identifies the 10 dimensions of burrito perfection (link) Sep 2016
Partially Derivative data science podcast, The quantified burrito (link) May 2016
FOX Carolina, $40K made in currency market by tracking social media (link) May 2012