

Curriculum Vitae

Stephen E. Clarke

D.O.B: January 6, 1988

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Current appointment

November 2017 – present

Postdoctoral Research Fellow

Stanford University

Department of Bioengineering

Department of Neurosurgery

Supervisor: Dr. Paul Nuyujukian

Co-supervisor: Dr. Krishna Shenoy

Post-secondary education

September 2010 – 2017

PhD, Neuroscience

University of Ottawa, Canada

Department of Cellular and Molecular Medicine

Supervisor: Dr. Leonard Maler

Co-supervisor: Dr. André Longtin

September 2006 - May 2010

University of New Brunswick, Canada

BSc, First Class Honors Mathematics, Biology Minor

Publications

Corresponding author *, Equal Contribution †

1. Bray, I.E. [†], **Clarke, S.E.** [†], Nuyujukian, P. * (2021) Neuroelectrophysiology-Compatible Electrolytic Lesioning (submitted @ IEEE TBME)

2. Trinh A-T, **Clarke, S.E.**, Harvey-Girard E., Longtin, A. and Maler L.* (2019) General cellular and molecular mechanisms of sparse coding in hippocampal-like structures *eNeuro* 6 (4).
3. **Clarke, S. E.*** (2018). Analog Signaling with the "Digital" Molecular Switch CaMKII. *Frontiers in Computational Neuroscience*, 12, 92.
4. **Clarke, S.E.*** and Maler, L. (2017) Feedback Synthesizes Neural Codes for Motion. *Current Biology* 27(9):1356-1361.
5. Marcoux C.M., **Clarke S.E.**, Nesse W.H., Longtin A. & Maler, L.* (2016) Balanced ionotropic receptor dynamics support signal estimation via voltage-dependent membrane noise. *Journal of Neurophysiology* 115: 530-545.
6. **Clarke, S.E.***, Longtin, A. & Maler, L.* (2015). Contrast coding in the electrosensory system: parallels with visual computation. *Nature Reviews Neuroscience* 16: 733–744.
7. **Clarke, S.E.***, Longtin, A., & Maler, L. (2015). The neural dynamics of sensory focus. *Nature Communications* 6: 8764. doi 10.1038/ncomms9764.
8. **Clarke S.E.***, Longtin, A. & Maler, L. (2014). A neural code for looming and receding motion is distributed over a population of electrosensory ON and OFF contrast cells. *The Journal of Neuroscience* 34(16): 5583-5594.
9. **Clarke, S.E.***, Naud, R., Longtin, A., & Maler, L. (2013). Speed-invariant encoding of looming object distance requires power law spike rate adaptation. *Proceedings of the National Academy of Sciences USA* 110(33), 13624-13629.
10. Wong, A. Y., Borduas, J. F., **Clarke, S.E.**, Lee, K. F., Béïque, J. C., & Bergeron, R.* (2013). Calcium influx through N-type channels and activation of SK and TRP-like channels regulates tonic firing of neurons in rat paraventricular thalamus. *Journal of Neurophysiology* 110(10), 2450-2464.

Opinion F1000 Nonlinear circuits for naturalistic visual motion estimation. DOI: 10.3410/f.725878181.793513033

Scholarships, Prizes and Awards

- Neural Engineering 2021 Outstanding Presentation – IEEE EMBS (2021)
- School of Medicine, Dean’s Postdoctoral Fellowship – Stanford University (2019)

- Governor General's Academic Gold Medal – University of Ottawa (2018)
<https://med.uottawa.ca/en/news/your-brain-math-applying-mathematics-study-neuroscience-wins-governor-generals-gold-medal>
- University of Ottawa Faculty of Medicine Award of Excellence (2013-2016)
- CIHR Frederick Banting and Charles Best Doctoral Research Award CGS (2014)
- Honourable mention – Canadian Student Health Research National Competition (2014)
- University of Ottawa Graduate Scholarship (2010-2017)
- Queen Elizabeth II-GSST (2013)
- University of Ottawa PhD seminar award – Faculty of Medicine (Dept. Cellular and Molecular Medicine; 2013)
- Ontario Graduate Scholarship (2012)
- The Dean's Scholarship - PhD transfer (Dept. Cellular and Molecular Medicine; 2012)
- NSERC Alexander Graham Bell Award CGS (2010)
- Louis Weisner Memorial Prize in Mathematics (Dept. Mathematics; 2010)
- Lewis Gregory Sears Memorial Scholarship (Dept. Mathematics; 2010)
- Applied Statistics Centre Prize II (Dept. Mathematics; 2009)
- William Somerville Prize (Dept. Mathematics; 2009)
- Steadman Bucknell Henderson Memorial Scholarship (Dept. Mathematics; 2009)
- NSERC Undergraduate Summer Research Award (Dept. Mathematics; 2008-2010)
- Thomas Harrison Memorial Prize (Dept. Mathematics; 2008)
- UNB Academic Scholarship (2007-2009)
- Governor Thomas Carleton Academic Scholarship (2006)

Conference posters and talks

- 10th International IEEE EMBS Conference on Neural Engineering (poster; May 2021)
- Society for Neuroscience Global Connectome: Virtual Event (poster; January 2021)
- Stanford Annual Wu Tsai Symposium (poster; October 2020)
- Stanford Bioengineering Retreat (talk; November 2019)
- Stanford Neurosciences Institute Retreat (poster; May 2018)
- Invited talk at Stanford University, CA (July 2017)
- Invited talk at York University, Toronto, ON (June 2017)
- Canadian Association For Neuroscience 2017, Montreal QC (poster; May 2017)
- Annual electric fish meeting, Mt. St. Hilaire, QC (talk; May 2015)
- Society for Neuroscience Meeting, Washington D.C. (poster; November 2014)
- Computational Neuroscience Meeting (Organization for Computational Neurosciences), Québec City, QC (poster; July 2014)
- Canadian Student Health Research Forum, National Poster Competition, University of Manitoba, Winnipeg, MA (June 2014)
- Annual electric fish meeting, Mt. St. Hilaire, QC (talk; May 2014)
- Annual electric fish meeting, Mt. St. Hilaire, QC (talk; May 2013)
- 10th International Congress of Neuroethology, University of Maryland, Washington D.C. (poster; August 2012)
- University of Ottawa 5th Computational Neuroscience Summer School – (talk; June 2011)

- Annual electric fish meeting, Mt. St. Hilaire, QC (attended; May 2011)
- University of Ottawa 4th Computational Neuroscience Summer School - (talk; June 2010)

Teaching appointments

May, 2013 and 2014

Teaching assistant

University of Ottawa

Departments: Physics, Cellular and Molecular Medicine

Course: Computational Neuroscience Summer School (NSC 8104)

Nature of work: Supervision of computer labs during course based-exercises and while students worked on their class projects. We were responsible for questions about course material, as well as assisting students to develop project ideas and implement them in Matlab/Python.

January – May, 2014

Teaching assistant

University of Ottawa

Department: Cellular and Molecular Medicine

Course: Systems Neuroscience (NSC 5104)

Nature of work: Grading class essays, presentations and exams.

September 2008 - April 2010

Lab teaching assistant

University of New Brunswick

Department: Biology

Course: Microbiology Laboratory (BIOL 3207)

Nature of work: Demonstrations of molecular biology lab techniques, supervision of lab times and holding consult hours for students to ask questions pertaining to lab protocol and theory.

September 2007 - January 2008

Teaching assistant

University of New Brunswick

Department: Mathematics and Statistics

Course: Introductory Calculus (MAT 1003)

Nature of work: Marking weekly assignments and running small tutorials for introductory calculus courses.

Programming and Mark-Up Languages

- Python

- Matlab
- Bash
- LaTeX

Graduate Courses Completed

- Cellular and Molecular Neuroscience
- Systems Neuroscience
- Computational Neuroscience
- Synaptic Transmission and Neuromodulation
- Dynamical Systems Theory (audited)
- NIH Grant Writing Academy Workshop

Volunteer Experiences and Professional Memberships

- Society for Neuroscience Member (2020-)
- IEEE Engineering in Medicine and Biology Society (2020-)
- American Heart Association / American Stroke Association (2020-)
- Organization for Computational Neuroscience Studnet Member (2014-2015)
- Society for Neuroscience Student Member (2014)
- Volunteer tutor for undergraduate mathematics and statistics (September 2013 – 2017)
- Let's Talk Science Volunteer (September 2010 - January 2012)
- Treasurer and Events Coordinator for the University of New Brunswick Math society (2009-2010)
- Peer Mentor for the Faculty of Science at the University of New Brunswick (2008 and 2009)
- Treasurer and events coordinator of the University of New Brunswick Biology society (2008-2009)