NUTTIDA RUNGRATSAMEETAWEEMANA

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EMPLOYMENT

Postdoctoral Research Fellow, Computational Neurobiology Laboratory, July 2020 - Present
The Salk Institute for Biological Studies La Jolla, CA
Advisor: Dr. Terrence J. Sejnowski

Postdoctoral Research Fellow, Army Research Laboratory, July 2020 - Present
The U.S. Army Human Research and Engineering Directorate Aberdeen, MD
Advisor: Dr. Javier O. Garcia

EDUCATION

Ph.D. in Neurosciences (Computational Specialization), May 2020
University of California, San Diego La Jolla, CA
Thesis: *Neural Dynamics of Probabilistic Perceptual Decision Making in the Human Brain*
Advisors: Dr. John T. Serences & Dr. Larry R. Squire

M.S. in Neurosciences (Computational Specialization) August 2016
University of California, San Diego La Jolla, CA
Advisors: Dr. John T. Serences & Dr. Larry R. Squire

B.A. in Mathematics and Neuroscience with Highest Distinction May 2014
Middlebury College Middlebury, VT
Mathematics Thesis: *A Mathematical Approach to Selective Visual Attention*
Neuroscience Thesis: *The Influence of Internal and External Arousal on Memory*
Advisors: Dr. Jason Arndt & Dr. Michael Olinick

RESEARCH EXPERIENCE

Computational Neuroscience Research December 2018 - Present
Computational Neurobiology Laboratory, The Salk Institute La Jolla, CA
Research Advisor: Dr. Terrence J. Sejnowski

- Developing computational frameworks to investigate the neural computations that underlie complex cognitive functions

Clinical Neuroscience Research December 2018 - Present
Computational Neurobiology Laboratory, The Salk Institute La Jolla, CA
The U.S. Army Research Laboratory Aberdeen, MD
Research Advisors: Dr. Terrence J. Sejnowski & Dr. Javier O. Garcia

- Using computational approaches to probe the dynamics of neural state changes in drug-resistant epilepsy
- First-author peer-reviewed paper (preprint)
- Co-first author peer-reviewed paper (*Chaos: An Interdisciplinary Journal of Nonlinear Science*)

Cognitive Neuroscience Research October 2014 - May 2016
Neuroscience Graduate Program, UCSD La Jolla, CA
Research Advisors: Dr. John T. Serences & Dr. Larry R. Squire

- Examined neural dynamics underlying visual memory, attention, and decision making in healthy individuals and amnesic patients
- First-author peer-reviewed papers (*Proceedings of the National Academy of Sciences*; *Journal of Neuroscience*; *Learning & Memory*)
- First-author peer-reviewed review article (*Current Opinion in Psychology*)

Experimental Psychology Research January 2011 - May 2014
Department of Psychology, Harvard University (Advisor: Dr. Daniel Schacter)
Department of Psychology, UCSD (Advisor: Dr. John T. Serences)
Department of Neuroscience & Psychology (Advisor: Dr. Jason Arndt)

- Designed and performed experiments to probe the flexibility of human memory and attention
- Third-author peer-reviewed paper (*Journal of Neuroscience*)

AWARDS AND HONORS

Funding

U.S. ARL BAA for Basic and Applied Scientific Research Award ($182,640) 2021 - 2023
- Proposal: *Hybrid decision-making in humans and artificial neural networks*
- Role: Principal investigator

U.S. Army Research Laboratory Graduate Fellowship ($120,118) 2018 - 2020
- Proposal: *Predictive coding in human sensory perception and cognition*

Training Grant, UCSD Neurosciences Graduate Program 2014 - 2015

Awards

Career Advancement Award, Salk Institute 2021

Anuradha Rao Memorial Award, Cell Press/ Society for Neuroscience 2021

College Scholar Award, Middlebury College 2010 - 2014

Senior Research Fellowship, Middlebury College 2013 - 2014

Middlebury College Research Travel Award 2013
- Awarded to present a poster at *44th Annual Meeting of the Society for Neuroscience*

Middlebury College Summer Research Fellowship 2012
- Awarded to intern in the lab of Dr. John T. Serences, UCSD

Neuroscience Undergraduate Research Scholarship 2009 - 2014
- Awarded by the Ministry of Science and Technology of Thailand

TECHINCAL SKILLS

Statistical modelling, Bayesian modelling, recurrent neural network, PCA, logistic regression, spectral analysis, feature extraction, graph-theoretical modelling, non-linear differential analysis

PUBLICATIONS

[1] **Rungratsameetaweemana N**, Lainscsek C, Cash SS, Garcia JO, Sejnowski TJ*, Bansal K*. Intrinsic network topology underlies heterogeneity of seizure dynamics. Preprint, 2021.

[2] **Rungratsameetaweemana N**, Itthipuripat S, Garcia JO, Serences JT. Distinct neural dynamics of top-down control shape decision-making under uncertainty. Preprint, 2021.

[3] Nelli S, Itthipuripat S, **Rungratsameetaweemana N**, Serences JT. The speed-accuracy tradeoff reveals flexible access to accumulating sensory evidence during human decision-making. Under revision.

[4] Lainscsek C*, **Rungratsameetaweemana N***, Cash SS, Sejnowski TJ. Cortical chimera states predict epileptic seizures. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 29: 121106, 2019.

[5] **Rungratsameetaweemana N**, Squire LR, Serences JT. Preserved capacity for learning statistical regularities and directing selective attention after hippocampal lesions. *The Proceedings of the National Academy of Sciences*, 116 (39): 19705-19710, 2019.

[6] **Rungratsameetaweemana N**, Serences JT. Dissociating the impact of attention and expectation on early sensory processing. *Current Opinion in Psychology*, 29: 181-186, 2019.

[7] **Rungratsameetaweemana N***, Itthipuripat S*, Salazar A, Serences JT. Expectations do not alter early sensory processing during perceptual decision-making. *Journal of Neuroscience*, 38 (24): 5632-5648, 2018.

[8] **Rungratsameetaweemana N**, Squire, LR. Preserved capacity for scene construction and shifts in perspective after hippocampal lesions. *Learning & Memory*, 25: 347-351, 2018.

[9] Itthipuripat S, Garcia, JO, **Rungratsameetaweemana N**, Sprague TC, Serences JT. Changing the spatial scope of attention alters patterns of neural gain in human cortex. *Journal of Neuroscience*, 34(1): 112-123, 2014.

* *these authors made equal contributions*

INVITED TALKS

[1] Probing decision making under uncertainty & The importance of allyship in science *STEMinar Series*, UCSD, May, 2021.

[2] Dynamics of top-down modulatory signals in humans and neural networks. *Dr. Dobromir Rahnev's lab*, Georgia Institute of Technology. March, 2021.

[3] Probabilistic decision making in humans and recurrent neural networks & The importance of mentorship in supporting diversity in science. *Diversity and Science Lecture Series*, UCSD. December, 2020.

[4] Uncovering dynamical chimera states in the human brain. *Intelligent and Complex Systems Research Seminar Series*, Chulalongkorn University, Thailand. June, 2020.

[5] Temporal dynamics of probabilistic decision making. *Neuroscience and Psychology Research Talk Series*, Middlebury College. January, 2020.

CONFERENCE TALKS

[1] **Rungratsameetaweemana N**, Kim R, Sejnowski TJ. Neural dynamics of probabilistic computations in humans and recurrent neural networks. Selected research spotlight, *Virtual Meeting of the Cognitive Neuroscience Society*. March, 2021.

[2] **Rungratsameetaweemana N**, Kim R, Sejnowski TJ. Probabilistic information processing in humans and recurrent neural networks. *Neuromatch 3.0 Conference*. October, 2020.

[3] **Rungratsameetaweemana N**, Lainscsek C, Cash SS, Sejnowski TJ. Cortical chimera states as predictors for epileptic seizures. Selected research spotlight, *IEEE Engineering in Medicine and Biology Society symposium and workshop on Brain, Mind, and Body: Cognitive Neuroengineering for Health and Wellness*. December, 2019.

[4] **Rungratsameetaweemana N**, Itthipuripat S, Salazar A, Serences JT. Expectation influences late stages of information processing. *18th Annual Meeting of the Vision Sciences Society*. May, 2018.

[5] **Rungratsameetaweemana N**, Olinick M. Mathematical implications of the normalization model of attention. *Annual Conference of Women in Mathematics of New England*. September, 2012.

CONFERENCE POSTER PRESENTATIONS

[1] **Rungratsameetaweemana N**, Kim R, Sejnowski TJ. Neural dynamics of probabilistic information processing in recurrent neural networks. *18th Annual Computational and Systems Neuroscience (Cosyne) Meeting*. February, 2021.

[2] **Rungratsameetaweemana N**, Lainscsek C, Cash SS, Sejnowski, Garcia JO, Bansal K. Intrinsic network topologies underlie distinct propagation dynamics of focal seizures. *Society for Neuroscience Global Connectome*. January, 2021.

[3] **Rungratsameetaweemana N**, Lainscsek C, Garcia JO, Bansal K, Cash SS, Sejnowski TJ. Uncovering dynamical states through concurrent electroencephalography (EEG) and electrocorticography (ECoG). *Virtual Meeting of the Cognitive Neuroscience Society*. June, 2020.

[4] **Rungratsameetaweemana N**, Lainscsek C, Cash SS, Sejnowski TJ. Cortical chimera states as predictors for epileptic seizures. *17th Annual Computational and Systems Neuroscience (Cosyne) Meeting*. February, 2020.

[5] **Rungratsameetaweemana N**, Lainscsek C, Cash SS, Sejnowski TJ. Cortical chimera states as predictors for epileptic seizures. *IEEE Engineering in Medicine and Biology Society symposium and workshop on Brain, Mind, and Body: Cognitive Neuroengineering for Health and Wellness*. December, 2019.

[6] **Rungratsameetaweemana N**, Itthipuripat S, Serences JT. Dissociable modulation of top-down control on perceptual decision making. *19th Annual Meeting of the Vision Sciences Society*. May, 2019.

[7] **Rungratsameetaweemana N**, Schmaelzle R, Bansal K, Wasylyshyn N, Roy H, Lauharatanahirun N, Johnson T, Fernandez R, O'Donnell M, Falk E, Metcalfe J, Vettel JM, Garcia JO. Capturing communication success of driver-passenger dyads during real-world driving. *9th International Conference of the IEEE Engineering in Medicine and Biology Society on Neural Engineering*. March, 2019.

[8] Garcia JO, Bansal K, **Rungratsameetaweemana N**, Wasylyshyn N, Roy H, Lauharatanahirun N, Johnson T, Fernandez R, Falk E, Metcalfe J, Vettel JM. Brain network communities between driver-passenger dyads capture successful communication while driving. *9th International Conference of the IEEE Engineering in Medicine and Biology Society on Neural Engineering*. March, 2019.

[9] **Rungratsameetaweemana N**, Vettel JM, Oliva JB, Verstynen T, Serences JT, Garcia JO. Intrinsic neural oscillations modulate feature selectivity in human visual cortex. *48th Annual Meeting of the Society for Neuroscience*. November, 2018.

[10] **Rungratsameetaweemana N**, Itthipuripat S, Serences JT. Temporal dynamics of prior expectations on human perceptual decision-making. *41st Annual European Conference on Visual Perception*. August, 2018.

[11] **Rungratsameetaweemana N**, Squire LR, Serences JT. Effects of attention and expectation on perceptual decision making after medial temporal lobe lesions. *47th Annual Meeting of the Society for Neuroscience*. November, 2017.

[12] **Rungratsameetaweemana N**, Itthipuripat S, Barker E, Wagstaff L, Serences JT. Task-irrelevant contextual expectation impairs orientation discrimination performance. *16th Annual Meeting of the Vision Sciences Society*. May, 2016.

[13] **Rungratsameetaweemana N**, Itthipuripat S, Barker E, Salazar A, Serences JT. Dissociable effects of attention and expectation on perceptual decision making. *45th Annual Meeting of the Society for Neuroscience*. October, 2015.

[14] **Rungratsameetaweemana N**, Itthipuripat S, Serences JT. Dissociable effects of sensory evidence and expectation during visual discrimination tasks. *15th Annual Meeting of the Vision Sciences Society*. May, 2015.

[15] **Rungratsameetaweemana N**, Arndt J. The influence of internal and external arousal on memory. *55th Annual Meeting of the Psychonomic Society*. November, 2014.

[16] Itthipuripat S, Garcia JO, **Rungratsameetaweemana N**, Sprague TC, Serences JT. Changing the spatial scope of attention alters patterns of neural gain in human cortex. *43rd Annual Meeting of the Society for Neuroscience*. November, 2013.

OUTREACH & MEDIA

Team Member, *Expanding Your Horizons of San Diego* 2021
- Organized an outreach workshop with the Society for Women in Graduate Studies that aimed to increase advancement of girls and women in STEM

Featured news article on *Middlebury Magazine Class Notes* 2021
Featured news article on *Pomfret School Alumni Spotlight* 2021
Featured news article on *The U.S. Army CCDC Research Spotlight* 2020
Member, *Diversity Admission Committee*, Neurosciences Graduate Program, UCSD 2015 - 2020
- Represented UCSD at Annual Meeting of the Society for Advancement of Chicanos/Hispanics and Native Americans in Science 2019

Team Member, *Xiao Pengyou*, VT 2011 - 2014
- Organized outreach activities for local Asian adoptees in Vermont

Program Leader, Pakchong Community Science Outreach, Thailand 2011 - 2013
Executive Board Member, Southeast Asian Service Leadership Network (SEALNet) 2011
Team Member, Middlebury College Community Friends Outreach Program 2011
Program Leader, National Mathematics and Science Outreach, Thailand 2010

TEACHING & MENTORING EXPERIENCE

Research Mentor

- Julie Eitzen (Undergraduate Independent Project, UCSD) 2021
- Carolyn Deustch (Undergraduate Independent Project, Cal Poly State University) 2021
- Mia Borzello (Graduate Rotation Project, UCSD) 2020
- Brianna Marsh (Graduate Rotation Project, UCSD) 2020
- Julia Phillips (Undergraduate Research Assistant, Fordham University) 2020
- Jimmy Yu (Undergraduate Independent Project, UCSD) 2017 - 2019
- Chenlu Wang (Undergraduate Research Assistant, UCLA) 2018
- Emely Anaya (Undergraduate Research Assistant, UCSD) 2018
- Kevin Diep (Undergraduate Independent Project, UCSD) 2017
- Lilli Wagstaff (Undergraduate Independent Project, UCSD) 2016 - 2017
- Tzu-en Wang (Undergraduate Independent Project, UCSD) 2016 - 2017
- Emily Barker (Undergraduate Independent Project, UCSD) 2015 - 2017

STEM Career Mentor, *Association for Women in Science (AWIS)*

- Sarah Maples (Neuroscience Graduate Student, UC Riverside) 2021-2022

Contest Judge, *The Afro-Academic, Cultural, Techonological and Scientific Olympics* 2021

Reviewing Mentor, *Computational & Systems Neuroscience (Cosyne) Mentoring Forum* 2020

Guest Lecturer

Neuroscience: From Brain to Behaviors, UCSD 2019
Geometry, Roong Arun High School, Thailand 2011
Calculus I, Roong Arun High School, Thailand 2011
General Biology, Princess Chulabhorn's College, Thailand 2010

Teaching Assistant

Special Topics in Psychology Course, UCSD 2015
Neurophysiology, Middlebury College 2013
Multivariable Calculus, Middlebury College 2013
Differential Equations, Middlebury College 2013
Psychological Statistics , Middlebury College 2013
Introduction to Psychology, Middlebury College 2013
Heart of Mathematics, Middlebury College 2012
Calculus II, Middlebury College 2011 - 2012

AD HOC REVIEWING

Biological Psychiatry: Global Open Science; eLife; Expert Systems with Applications; Frontiers in Human Neuroscience; IEEE Transactions on Biomedical Engineering; Journal of Neuroscience; Learning & Memory; NeuroImage