

CURRICULUM VITAE

Seth William Egger

Personal information

Born: May 8, 1983, San Pablo CA
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Education

2005 B.S. (Psychology, minor: Biological Sciences): University of California, Davis, CA.
2013 Ph.D. Neuroscience: University of California, Davis, CA.

Positions held

2003-2004 Undergraduate assistant with Dr. Donald Owings, Dept. of Psychology, UC Davis
2004-2005 Undergraduate assistant with Dr. Jeffrey Schank, Dept. of Psychology, UC Davis
2005-2006 Junior Specialist with Dr. Kenneth Britten, Dept. of Neurobiology, Physiology and Behavior, UC Davis
2006-2013 Predoctoral fellow with Dr. Kenneth Britten, Neuroscience Graduate Group, UC Davis
2013-2019 Postdoctoral Associate with Dr. Mehrdad Jazayeri, McGovern Institute for Brain Research, MIT
2019-present Senior Research Associate with Dr. Stephan Lisberger, Department of Neurobiology, Duke University School of Medicine

Research interests

Neural basis and implementation of internal models
Optimal estimation and control by neural systems
Cue integration
Visual-motor behavior
Neural network implementation of sensorimotor behaviors
Processing of visual motion information

Teaching experience

2009, 2010, 2011, 2012 TA for lower-level course, Neurobiology, Physiology and Behavior 14: Illusions, UC Davis
2010, 2011 TA for upper-level course, Neurobiology, Physiology and Behavior 100: Neurobiology (Fall Quarter), UC Davis
2016 IAP Tutorial on dynamical systems; MIT

Honors and awards

2002 NSCS Nomination for Membership
2007 Recognition for exceptional performance on Qualifying Exam Part I, UC Davis Graduate Program in Neuroscience
2006, 2007, 2012 Neuroscience Graduate Fellowship, University of California, Davis

Professional memberships

Society for Neuroscience
Vision Sciences Society

Service

Neuroscience Retreat Committee, Neuroscience graduate group, UC Davis; 2006-2007
TA Union Representative, Neuroscience graduate group, UC Davis; 2008-2013
UC Davis Brain Awareness Week: High School Outreach Volunteer; 2008, 2009, 2010
UC Davis Neuroscience Graduate Group Student Sponsored Seminar Series: Host; 2010, 2011
Reviewer, Computational and Systems Neuroscience annual meeting; 2019

Recent presentations

- 2016 "Humans implement nonlinear computations to achieve near optimality in the face of scalar variability." Vision Sciences Society Annual Meeting. St. Pete Beach, FL.
- 2017 "Predictive computations to coordinate motor plans with isochronous input." Neural Entrainment and Rhythm Dynamics. Boston, MA.
- 2017 "Internal models of sensorimotor integration regulate cortical dynamics." Advances in Motor Learning and Motor Control. Washington D.C.
- 2018 "Internal models of sensorimotor integration regulate cortical dynamics." Computational Neuroscience. Seattle, WA.
- 2019 "Internal models of sensorimotor integration regulate cortical dynamics." Simons Collaboration on the Global Brain Boston-Area Postdoc Meeting.
- 2020 "Sensory decoding is a major contributor to variation in motor behavior." Neuromatch 2.0.
<https://www.crowdcast.io/e/neuromatch2/49>

Publications

Egger, S.W.*, Le, N.M.*, and Jazayeri, M. (in press). "A neurally circuit model for human sensorimotor timing." *Nature Communications*.

Egger, S.W.*, Remington, E.D., Chung, C.-J., and Jazayeri, M. (2019). "Internal models of sensorimotor integration regulate cortical dynamics." *Nature Neuroscience* 22. doi:10.1038/s41593-019-0500-6

Egger, S.W.* and Jazayeri, M. (2018). "A nonlinear updating algorithm captures suboptimal inference in the presence of signal-dependent noise." *Scientific Reports* 8(1). doi:10.1038/s41598-018-30722-0

Remington, E.D.*, **Egger, S.W.***, Narain, D., Wang, J., Jazayeri, M. (2018). "A dynamical systems perspective on flexible motor timing." *Trends In Cognitive Sciences*. doi.org/10.1016/j.tics.2018.07.010

Egger, S.W.* and Britten, K.H. (2013). "Linking sensory neurons to visually guided behavior: relating MST activity to steering in a virtual environment." *Visual Neuroscience* 30(5-6):315-30. doi: 10.1017/S0952523813000412

Egger, S.W.*, Engelhardt, H.R., and Britten, K.H. (2010). "Monkey Steering Responses Reveal Rapid Visual-Motor Feedback." *PLoS ONE* 5(8): e11975. doi:10.1371/journal.pone.0011975

Egger, S.W.*, Keemink, S., Goldman, M.S., and Britten K.H. (in preparation). "Linear, nonlinear, noise and adaptive contributions to macaque steering behavior."

Egger, S.W.* and Lisberger, S.G. (in preparation). "Decoder noise is a major contributor to variation in motor control."

Tremblay, S.*, Acker, L., Afraz, A., Albaugh, D.L., Amita, H., Andrei, A.R., Angelucci, A., Aschner, A., Balin, P.F., Caiola, M.J., Calcedo, R., Cavanaugh, J., Chen, Y., Chen, S., Chernov, M.M., Clark, A.M., Debes, S.R., Deisseroth, K., Desimone, R., Dragoi, V., **Egger, S.W.***, Eldridge, M., El-Nahal, H.G., Fabbrini, F., Federer, F., Fetsch, C.R., Fortuna, M.G., Friedman, R.M., Fujii, N., Gail, A., Galvan, A., Ghosh, S., Gieselmann, M.A., Gulli, R.A., Hikosaka, O., Hosseini, E.A., Hu, X., Hüer, J., Inoue, K., Janz, R., Jazayeri, M., Jiang, R., Ju, N., Kar, K., Klien, C., Kohn, A., Komatsu, M., Maeda, K., Martinez-Trujillo, J.C., Matsumoto, M., Maunsell, J.H.R., Mendoza-Halliday, D., Monosov, I.E., Muers, R.S., Nurminen, L., Ortiz-Rios, M., O'Shea, D.J., Palfi, S., Petkov, C.I., Pojoga, S., Rajalingham, R., Ramakrishnan, C., Remington, E.D., Revsine, C., Roe, A.W., Sabes, P.N., Saunders, R., Scherberger, H., Schmid, M.C., Schultz, W., Seidemann, E., Senova, Y.-S., Shadlen, M.N., Siu, C., Smith, Y., Solomon, S.S., Sommer, M.A., Spudich, J.L., Stauffer, W.R., Takada, M., Tang, S., Thiele, A., Treue,

S., Vanduffel, W., Vogels, R., Whitmire, M.P., Wichmann, T., Wurtz, R.H., Xu, H., Yazdan-Shahmorad, A., Shenoy, K., DiCarlo, J., Platt, M.L. (in preparation). "An Open Resource for Non-Human Primate Optogenetics."

* First author

Abstracts

Egger, S.W. and K.H. Britten (2006). "Visual cues affecting steering responses in humans." Poster No. 641.15/P11. Neuroscience Meeting Planner. Atlanta, GA: Society for Neuroscience 2006. Online.

Egger, S.W., C. Hansen, and K.H. Britten (2008). "Comparison of response dynamics in areas MT, MST, and VIP." *COSYNE Abstr.* #278

Egger, S.W. and K.H. Britten (2010). "Monkey steering behavior in a virtual environment reveals dynamic cue weights." Poster No. 777.5/JJ1. Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience. Online.

Egger, S. W. and Britten, K. H. (2013). "Tuning of MST neurons during active steering." Poster No. 263.02/QQ8. Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience 2013. Online.

Vieira, F., **Egger, S.W.**, and Britten, K.H. (2014). "Response decay kinetics in areas MT, MST, and VIP on the motion pathway in macaques." Poster No. 236.03/Z5. Neuroscience Meeting Planner. Washington D.C.: Society for Neuroscience 2014. Online.

Li, X., **Egger, S.W.** and Britten, K.H. (2014). "The role of MST in visual-motor processing for navigation." Poster No. 821.09/GG32. Neuroscience Meeting Planner. Washington D.C.: Society for Neuroscience 2014. Online.

Wang, J., **Egger, S.W.**, Remington, E.D. and Jazayeri, M. (2014). "Behavioral training for oculomotor tasks in head-free non-human primates." Poster No. 625.04/DD31. Neuroscience Meeting Planner. Washington D.C.: Society for Neuroscience 2014. Online.

Egger, S. W. and Jazayeri, M (2014). "Integration of short-term and long-term temporal information in interval timing." Poster No. 556.06/TT50. Neuroscience Meeting Planner. Washington D.C.: Society for Neuroscience 2014. Online.

Egger, S. W., Chang, C. -J., and Jazayeri, M. (2015). "Response of neurons in the medial prefrontal cortex during a time interval integration task." Poster No. 601.09/ L31. Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience 2015. Online.

Egger, S.W. and Jazayeri, M. (2016) Humans implement nonlinear computations to achieve near optimality in the face of scalar variability. #35.28. *Journal of Vision* September 2016, Vol.16, 583. doi:10.1167/16.12.583.

Egger, S.W., Chang, C. -J., and Jazayeri, M. (2017). "Cortical neurons regulate dynamics to integrate sensory input into motor plans." *COSYNE Abstr.* #388.

Egger, S.W., Chang, C. -J., and Jazayeri, M. (2017). "Predictive computations to coordinate motor plans with isochronous input." *Neural Entrainment and Rhythm Dynamics*. Boston, MA.

Egger, S.W., Chang, C. -J., and Jazayeri, M. (2017). "Predictive coding of temporal events through regulation of cortical dynamics." Poster No. 407.23 / LL24. Neuroscience Meeting Planner. Washington D.C.: Society for Neuroscience 2017. Online.

Egger, S.W., Remington, E.D., Chang, C.-J., and Jazayeri, M. (2017). "Internal models of sensorimotor integration regulate cortical dynamics." *Advances in Motor Learning and Motor Control*. Washington D.C.

Egger, S.W., Remington, E.D., Chang, C.-J., and Jazayeri, M. (2018). "Internal models of sensorimotor integration regulate cortical dynamics." *COSYNE Abstr.* #451

Egger, S.W., Le, N., and Jazayeri, M. (2018). "On the capacity of recurrent inhibition models for Bayesian updating and control of behavior." Poster No. 427.14/JJJ37. Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience 2018. Online.

Egger, S.W., Le, N., and Jazayeri, M. (2019). "A neurally inspired circuit model for human sensorimotor timing." *COSYNE Abstr.* #313

Egger, S.W. and Lisberger, S.G. (2020). "Contribution of sensory-motor gain to signal and noise in motor control."
COSYNE Abstr. #84