

Emil Olsson

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Research Experience

University of California Irvine - Cognitive & Neural Computation Lab

LAB MANAGER

2023 - Present

- Researching theories of consciousness and metacognition using neuroimaging and computational methods
- Supporting Dr. Megan Peters in managing lab operations and developing tools for computational research infrastructure

Lund University - Faculty of Medicine

RESEARCH SPECIALIST

2019 - 2023

- Biomarkers For Identifying Neurodegenerative Disorders Early and Reliably <https://biofinder.se/>
- fMRI of Early Changes in Alzheimer's Disease

Lund University - Department of Psychology

RESEARCH ASSISTANT

2018 - 2023

- The Effect of Mindfulness Training on Physiological, Behavioral and Neural Indices of Fear and Extinction Learning Disorders
- Technologically Enhanced Language Learning and its Effect on the Brain
- Preliminary Evidence of Efficacy and Target Engagement of Pramipexole in Anhedonic Depression
- Neural Substrates of Emotional Processing in Youth with OCD and Anxiety
- Effects on Brain & Cognition from Mindfulness Training in School
- Cognitive Psychological Effects in Mental Illness: Emotional Reactions to Faces and Aversive Sound

Uppsala University - Department of Psychology

RESEARCH ASSISTANT

2018 - 2023

- Functional Imaging of the Human Amygdala During Fear Conditioning
- Neural Mechanisms of Fear Exposure Mechanisms in Spiderphobia

Karolinska Institutet - Department of Neurobiology

RESEARCH ASSISTANT

2019 - 2020

- Fine Motor Skills and Short-term Plasticity in the Brain

Education

Lund University

MA, COGNITIVE SCIENCE

2019 - 2021

- Thesis: Cognitive Memory Assessment in 2D and 3D Virtual Reality
- Lab rotations: The Cognitive Zoology Group & Lund Cognitive Robotics Lab

Lund University

BS, PSYCHOLOGY

2018 - 2019

- Thesis: Long-term Retention of Reinforcement Learning and the Effect of Context

Halmstad University

BS, INTERNATIONAL MARKETING

2014 - 2017

- Thesis: Customer's Perception of Neuro-Linguistic Programming (NLP) Techniques in Sales Communication
- Internship: Nudge (New York, USA)

Publications

PUBLISHED

Tian, K. J., Maniscalco, B., Epstein, M. L., Shen, A., Graham Castaneda, O., Kurosawa, T., Motzer, J. A., **Olsson, E.**, Russell, E. E., Walsh, M. E., Wang, J., Awrang Zeb, T. B., Brown, R., Lamme, V. A. F., Lau, H., He, B. J., Brascamp, J. W., Block, N., Chalmers, D., Peters, M. A. K., & Denison, R. N. (2025). Attention robustly dissociates objective performance and subjective visibility reports. *bioRxiv*. [Preprint]

Berron, D., **Olsson, E.**, Andersson, F., Janelidze, S., Tideman, P., Duezel, E., Palmqvist, S., Stomrud, E., & Hansson, O. (2024). Remote and unsupervised digital memory assessments can reliably detect cognitive impairment in Alzheimer's disease. *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*.

Olsson, E., Gustavsson, L., Magnusson, F., & Sikström, K (2021). Crime Scene Investigation in Virtual Reality. In Johansson, B., Gulz, A., Haake, M., Wallergård, M., Alce, G., Niehorster, D., Nirme, J., Ternblad, E.M., & Tärning, B. (Eds.). *Intelligent, socially oriented technology V: Projects by teams of master level students in cognitive science and engineering. Course Anthology*.

CONFERENCES

Olsson, E.*, Abachi, S. P., Maniscalco, B., Cushing, C. A., & Peters, M. A. K. (2025). A pilot study of computationally-informed fMRI decoded neurofeedback for modulating metacognitive neural signatures. *Society for Neuroscience Annual Meeting (SfN 2025)*, San Diego, CA. Poster; Session PSTR039: Computational Modeling of Decision-Making and Learning; 11/15/2025, 1:00–5:00 PM PT. [Accepted; presenting author].

Ekhlas, A., **Olsson, E.**, Klimova, M., Huang, X., Shen, A., Garcia, K. M. I., Dijkstra, N., Morales, J., & Peters, M. A. K. (2025, Nov). Reproducible and open-source fMRI decoding pipelines for arbitrating theories of consciousness. *Society for Neuroscience Annual Meeting (SfN 2025)*, San Diego, CA. Poster; Session PSTR469: Neural Dynamics of Visual Consciousness and Awareness; 11/19/2025, 1:00–5:00 PM PT. [Accepted].

Huang, X., Shen, A., **Olsson, E.**, Garcia, K. M. I., Dijkstra, N., Peters, M. A. K., & Morales, J. (2025). What makes mental images vivid? Sharpness as the key visual dimension. *Journal of Vision*

Huang, X., Shen, A., **Olsson, E.**, Garcia, K. M. I., Dijkstra, N., Peters, M. A. K., & Morales, J. (2025). What makes mental images vivid? Sharpness as the key visual dimension. *Association for the Scientific Study of Consciousness (ASSC 28)*, Poster Session 3: Altered States, Non-Ordinary States, Hallucinations, Mental Imagery

Tian, K. J., Maniscalco, B., Epstein, M. L., Shen, A., Graham Castaneda, O., Arzu, G., Kurosawa, T., Motzer, J. A., **Olsson, E.**, Romero, L., Russell, E. E., Walsh, M. E., Wang, J., Awrang Zeb, T. B., Brown, R., Lamme, V. A. F., Lau, H., He, B. J., Brascamp, J. W., Block, N., Chalmers, D., Peters, M. A. K., & Denison, R. N. (2024). Subjective inflation under inattention is robust across stimulus types and performance levels, for both threshold and suprathreshold stimuli. *Association for the Scientific Study of Consciousness (ASSC 27)*

Tian, K., Maniscalco, B., Epstein, M., Shen, A., Graham Castaneda, O., Arzu, G., Kurosawa, T., Motzer, J., **Olsson, E.**, Romero, L., Russell, E., Walsh, M., Wang, J., Awrang Zeb, T. B., Brown, R., Lamme, V., Lau, H., He, B., Brascamp, J., Block, N., Chalmers, D., Peters, M., & Denison, R. (2024). Attention robustly dissociates objective performance and subjective visibility reports. *Journal of Vision*

Berron, D., Baumeister, H., Diers, K., Reuter, M., Xie, L., **Olsson, E.**, Andersson, F., Wisse, L. E. M., Strandberg, O., Smith, R., Stomrud, E., & Hansson, O. (2022). Hippocampal subregional thinning related to tau pathology in early stages of Alzheimer's disease. *Alzheimer's Association International Conference*.

Björkstrand, J., Karlsson, B., Rosén, J., **Olsson, E.**, Åhs, F., Fredrikson, M., & Frick, A. (2020). High Unconditioned Stimulus Intensity Results in Stronger Threat Conditioning Than Low Intensity. *Biological Psychiatry*.

THESES

Olsson, E. (2021). Cognitive Memory Assessment in 2D and 3D Virtual Reality. *LUP Student Papers*, Master's thesis, Lund University.

Olsson, E., & Köhler, G. (2019). Retention of reinforcement learning and the effect of context. *LUP Student Papers*, Bachelor's thesis, Lund University.

Olsson, E., & Rexmyr, J. (2017). Customer's perception of Neuro-Linguistic Programming (NLP) techniques in sales communication. *DiVA*, Bachelor's thesis, Halmstad University.

PREREGISTRATIONS

Epstein, M., **Olsson, E.**, Tian, K., Maniscalco, B., Motzer, J., Peters, M. A. K., & Denison, R. N. (2025). An adversarial collaboration to test predictions of first-order and higher-order theories of consciousness: Updated preregistration for Experiment 1 fMRI. *OSF*.

ACKNOWLEDGEMENTS

Maniscalco, B., Graham Castaneda, O., Odegaard, B., Morales, J., Rajananda, S., Denison, R., & Peters, M. A. K. (2020). The relative psychometric function: A general analysis framework for relating psychological processes. *PsyArXiv*.

Karlsson, M. G. (2021). A system for affective touch in humanoid and social robotics. *LUP Student Papers*.

Mentoring & Supervision

- Maggie Zhang (2025- , UCI Cognitive Science)
- Minh Nguyen (2025- , UCI Cognitive Science)
- Meera Sriram (2025- , UCI Cognitive Science)
- Jessica Kwang (2025- , UCI Cognitive Science)
- Tulika Basu (2024- , UCI Cognitive Science)
- Pierre Klintefors (2022-2023, Lund University Cognitive Science)
- Petter Clemensson (2021–2022, Lund University Bioengineering)
- Oisin Clancy (2021-2022, Lund University Mathematics)

Extracurricular

TRAINING COURSES

- BCI & Neurotechnology Spring School 2024 - g.tec
- Neo4j Fundamentals and Mastering GraphRAG - Neo4j Graph Academy
- Computational Neuroscience Summer Course – Neuromatch Academy
- BCI & Neurotech Masterclass Sweden 1.0 - g.tec
- Mathematics for Machine Learning Specialization - Imperial College on Coursera
- Principles of fMRI - John Hopkins University on Coursera
- EEG Analysis Seminar Series - Lund University at Campus
- Linux Course 1 year - Valla Folk High School Online

MEMBERSHIPS

Society for Neuroscience (SfN) · The Kaleidoscope Journal Club · Swedish Network for Psychedelic Science

TEACHING

Co-Founder, CEO & Tutor - Studero

- Led a team of three to provide weekly private tutoring in core science disciplines to young students for two years.

TECHNICAL SKILLS

- Programming: Python, JavaScript, R, MATLAB, Wolfram language, Java, C#
- Data Collection: fMRI, MRI, EEG, Eye-Tracking, Skin Conductance Response, Psychophysics
- Analysis Tools: Freesurfer, SPM, FSL, CONN-toolbox, fMRIPrep, MRIQC, Nilearn, PyTorch
- Statistics: Machine Learning, Statistical Analysis, Functional Connectivity, Multivariate Pattern Analysis (MVPA)
- Experiment design: PsychoPy, Psychtoolbox, E-Prime, Unity, Virtual Reality (VR)
- Creative editing: Adobe Premiere Pro, Blender, Unreal Engine

References

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| Researcher | Dr. Megan Peters , Associate Professor, Department of Cognitive Sciences at University of California, Irvine <i>megan.peters@uci.edu</i> |
| Researcher | Dr. David Berron , Group Leader, German Center for Neurodegenerative Diseases <i>david.berron@dzne.de</i> |
| Researcher | Dr. Johannes Björkstrand , Assistant Professor, Department of Psychology at Lund University <i>johannes.bjorkstrand@psy.lu.se</i> |
| Researcher | Dr. Nicola Spotorno , Associate Researcher, Clinical Memory Research, MultiPark: Multidisciplinary research focused on Parkinson´s disease <i>nicola.spotorno@med.lu.se</i> |