

David Alexander Klindt

(+1) 650 546 6128 • [email](#) • [homepage](#) • [google scholar](#) • [linkedin](#) • [github](#)

Researcher in Machine Learning & Computational Neuroscience

Passionate about using AI to understand the Brain and building Brain-inspired AI.

Education

- 2023 – **Postdoctoral Research Associate, Stanford University**
Supervisors: Frederic Poitevin ([SLAC](#)), Nina Miolane ([UC Santa Barbara](#))
- 2021 – 22 **Postdoctoral Fellow, Norwegian University of Science & Technology**
Supervisor: Benjamin Dunn (Department of Mathematical Sciences)
- 2016 – 21 **Ph.D. Machine Learning & Computational Neuroscience, University of Tübingen**
Supervisor: Thomas Euler; Thesis: *Identifying the Elements of Visual Processing*
- 2014 – 16 **M.Sc. Dual Masters Brain & Mind Sciences, UCL, ENS & UPMC**
Supervisors: Christoph Mathys, Jean Daunizeau & Karl Friston
- 2021 – **B.Sc. Mathematics & Computer Sciences, Distance-learning University Hagen** (part-time)
- 2012 – 14 **B.A. Philosophy, Neuroscience & Cognitive Sciences, University of Magdeburg**

Work Experience

- 2022 – 23 **Machine Learning Research Scientist, Meta Reality Labs, Burlingame, USA**
CTRL labs: Niru Maheswaranathan & David Sussillo; Data analysis of EMG motor output controllers; Model development for neural interfaces with virtual and augmented reality.
- 2019 **Research Intern, Google Research, Mountain View, CA, USA**
Learned compression team, supervisors: Johannes Ballé, Jon Shlens & Eero Simoncelli;
Built neural network to learn manifolds, improving by 28.4% over state-of-the-art.
- 2013 **Research Assistant, German Center for Neurodegenerative Diseases, Magdeburg, Germany**
Group: Emrah Düzel, Clinical Neurophysiology & Memory; Analyzed data and conducted fMRI experiments to test the efficacy of deep brain stimulation as a treatment for dementia.

Service

- 2021 **Course Organizer, Neuromatch Deep Learning Academy**
- 2018 – **Reviewer** for major machine learning venues (ICML, ICLR, NeurIPS, JMLR and Workshops)
- 2010 – 11 **Teaching Volunteer, Tian Zhen Yuan School, Chengguanzhen, Hebei, China**

Programming Skills

- 2018 **Summer School, 11th Advanced Scientific Programming in Python, G-Node, Camerino, Italy**
Topics: GitHub, Testing Code, Documenting & Packaging, Advanced NumPy, Data Visualization, Advanced Python (Functions, Classes, Generators), Profiling Code, Cython & Numba, Memory Bound Problems, Parallel Python.

Peer-reviewed Publications

JOURNAL AND CONFERENCE PAPERS

1. Y. Qiu, **D. A. Klindt**, K. P. Szatko, D. Gonschorek, T. Schubert et al. (2023) “Efficient coding of natural scenes improves neural system identification”. *PLoS Comput Biol* 19(4).
2. **D. A. Klindt** (2023) “Controlling Neural Network Smoothness for Neural Algorithmic Reasoning”. *Transactions on Machine Learning Research*. TMLR 2023.
3. M. Bjerke, L. Schott, K. T. Jensen, T. Kao, C. Battistin, **D. A. Klindt*** & B. A. Dunn* (2023) “Understanding Neural Coding on Latent Manifolds by Sharing Features and Dividing Ensembles”, 11th *ICLR*.
4. **D. A. Klindt**, S. Gaukstad, E. Hermansen, M. Vaupel & B. A. Dunn (2023) “Topological Ensemble Detection with Differentiable Yoking”, *NeurReps Symmetry and Geometry in Neural Representations, NeurIPS 35 (PMLR 197:354-369, Volume “Proceedings of Topology, Algebra, and Geometry in Learning”)*.
5. A. Myers, S. Utpala, S. Talbar, S. Sanborn, C. Shewmake, C. Donnat, J. Mathe, R. Sonthalia, X. Cui, T. Szwagier, A. Pignet, A. Bergsson, S. Hauberg, D. Nielsen, S. Sommer, **D. A. Klindt**, E. Hermansen, M. Vaupel, B. Dunn, J. Xiong, N. Aharony, I. Pe’er, F. Ambellan, M. Hanik, E. Nava-Yazdani, C. Tycowicz & N. Miolane (2022) “ICLR 2022 Challenge for Computational Geometry and Topology: Design and Results”, 10th *ICLR (PMLR 196:269-276, Proceedings of Topological, Algebraic, and Geometric Learning Workshops)*.
6. R. Zimmermann, L. Schott, Y. Song, B. A. Dunn & **D. A. Klindt** (2021) “Score-Based Generative Classifiers”, *Deep Generative Models and Applications, NeurIPS 34*.
7. D. Gonschorek, L. Höfling, K. Szatko, K. Franke, T. Schubert, B. A. Dunn, P. Berens, **D. A. Klindt*** & T. Euler* (2021) “Removing Inter-Experimental Variability from Functional Data in Systems Neuroscience”, *NeurIPS 34*. (spotlight presentation)
8. Y. R. Qiu, Z. Z. Zhao, **D. A. Klindt**, M. Kautzky, K. P. Szatko, F. Schaeffel, K. Rifai, K. Franke, L. Busse & T. Euler (2021) “Natural environment statistics in the upper and lower visual field are reflected in mouse retinal specializations”, *Current Biology*, Jun 8.
9. **D. A. Klindt***, L. F. Schott*, Y. Sharma*, I. Ustyuzhaninov, W. Brendel, M. Bethge & D. Paiton (2021) “Towards Nonlinear Disentanglement in Natural Data with Temporal Sparse Coding”, 9th *ICLR*. (oral presentation) [git](#)
10. Z. Zhao*, **D. A. Klindt***, A. M. Chagas, K. P. Szatko, L. Rogerson, D. Protti, C. Behrens, D. Dalkara, T. Schubert, M. Bethge, K. Franke, P. Berens, A. S. Ecker & T. Euler (2020) “The temporal structure of the inner retina at a single glance”, *Nature Scientific Reports* 10 (1).
11. C. Schröder*, **D. A. Klindt***, S. Strauss, K. Franke, M. Bethge, T. Euler & P. Berens (2020) “System Identification with Biophysical Constraints: A Circuit Model of the Inner Retina”, *NeurIPS 33*. (spotlight presentation)
12. **D. A. Klindt***, A. S. Ecker*, T. Euler & M. Bethge (2017) “Neural system identification for large populations separating ‘what’ and ‘where’”, *NeurIPS 30*. [git](#)

13. **D. A. Klindt**, M. Devaine & J. Daunizeau (2017) “Does the way we read others’ mind change over the lifespan? Insights from a massive web poll of cognitive skills from childhood to late adulthood”, *Cortex*, Volume 86: Pages 205-215.

CONFERENCE ABSTRACTS

14. L. Höfling, P. Berens, T. Euler, K. P. Szatko, C. Behrens, Y. Qiu, **D. A. Klindt**, Z. F. Jessen, G. W. Schwartz, T. Schubert, M. Bethge, K. Franke & A. Ecker (2023) “Model-guided discovery of a retinal chromatic feature detector that signals visual context changes”, *Cosyne*.
15. Y. Qiu, **D. A. Klindt**, K. Szatko, L. Busse, M. Bethge & T. Euler (2022) “Normative Network Regularization for Neural System Identification”, *Cosyne*.
16. **D. A. Klindt**^{*}, C. Schröder^{*}, A. Vlasits, K. Franke, P. Berens & T. Euler (2021) “Modelling Functional Wiring and Processing from Retinal Bipolar to Ganglion Cells”, *Cosyne*.
17. **D. A. Klindt**^{*}, J. Ballé^{*}, J. Shlens & E. P. Simoncelli (2020) “Unsupervised Learning of Image Manifolds with Mutual Information”, Cold Spring Harbor Laboratory meeting: *From Neuroscience to Artificially Intelligent Systems*.
18. **D. A. Klindt**^{*}, L. E. Rogerson^{*}, Z. Z. Zhao, K. Szatko, K. Franke, D. Kobak, A. S. Ecker, M. Bethge, P. Berens & T. Euler (2019) “Adjusting for batch effects in two photon imaging recordings of the retinal inner plexiform layer”. *Cosyne*.

Pending Publications

19. E. Hermansen, **D. A. Klindt** & B. A. Dunn (under review) “Uncovering 2-D toroidal representations in grid cell ensemble activity during 1-D behavior”.
20. L. Höfling, K. Szatko, C. Behrens, Y. Qiu, **D. A. Klindt**, Z. Jessen, G. S. Schwartz, M. Bethge, P. Berens, K. Franke, A. Ecker & T. Euler (under review) “Colour-opponent mouse retinal ganglion cell type revealed by model-driven stimulus space search”.