

Dr. Robert Geirhos

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🌐 Website	https://robertgeirhos.com		65 King Street East
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🔗 Scholar	Robert Geirhos		Canada

Professional experience

Google DeepMind & Google Brain

Since 5/25 Senior Research Scientist, *Google DeepMind*
8/22 – 4/25 Research Scientist, *Google Brain*, later *Google DeepMind*

University of Tübingen

11/21 – 6/22 Postdoctoral Researcher, *Department of Computer Science*

🎓 [Felix Wichmann](#)

🎓 [Wieland Brendel](#)

Meta AI & Facebook AI Research (FAIR)

1/22 – 5/22 External Research Collaborator, *part-time via PRO Unlimited*
7/21 – 10/21 PhD Research Intern

🎓 [Ari Morcos](#)

🎓 [Surya Ganguli](#)

University of Tübingen & IMPRS-IS

11/18 – 7/21 Doctoral Researcher, *Department of Computer Science &*
International Max Planck Research School for Intelligent Systems

🎓 [Felix Wichmann](#)

🎓 [Matthias Bethge](#)

Education

2018 – 2022 **Ph.D. in Computer Science, summa cum laude**

German title: Dr. rer. nat. (Doctor of Science)
Department of Computer Science, University of Tübingen &
International Max Planck Research School for Intelligent Systems

2016 – 2018 **M.Sc. Computer Science, with distinction**

Grade 1.1/1.0 (“excellent”)
Department of Computer Science, University of Tübingen

2017 – 2018 Exchange student

School of Informatics, University of Amsterdam

2013 – 2016 **B.Sc. Cognitive Science**

Grade 1.37/1.0 (“excellent”)
Department of Computer Science, University of Tübingen

2015 Exchange student

Schools of Computing Science & Psychology, University of Glasgow

2004 – 2012 **Abitur**

Grade 1.0/1.0 (“excellent”)
Montfort-Gymnasium Tettnang

“Weltwärts” development volunteer service

2012 – 2013 Live-in volunteer (12 months)

Asha Niketan is a L’Arche interfaith community in Kolkata, India, where people with and without intellectual disabilities not only work together, but also share their life.

Asha Niketan Kolkata (formerly Calcutta), India

Open Source projects

Contributing to Open Source is important to me. I created and maintain the following Open Source projects, either as the lead developer (★) or as the lead supervisor (☆):

- 🔗 ★ 800+ [rgeirhos/texture-vs-shape](#): an analysis method to assess the degree to which black-box neural network models rely on local (texture) features.
- 🔗 ★ 500+ [rgeirhos/Stylized-ImageNet](#): code to create Stylized-ImageNet, a strong data augmentation technique for increasing out-of-distribution robustness.
- 🔗 ☆ 400+ [bethgelab/imagecorruptions](#): a Python package for out-of-distribution robustness testing, used by 4,000+ repos as part of [mmdetection](#), a leading object detection toolbox.
- 🔗 ★ 350+ [bethgelab/model-vs-human](#): a Python toolbox to test the out-of-distribution robustness and biases of PyTorch and TensorFlow models against high-quality human data.
- 🔗 ☆ 200+ [google-deepmind/physics-IQ-benchmark](#): an evaluation protocol, benchmark and dataset for evaluating physical understanding in generative video models.
- 🔗 ★ 150+ [bethgelab/robust-detection-benchmark](#): a benchmark to assess the robustness of object detection models towards outdoor hazards like snow / fog / frost.
- 🔗 ☆ 150+ [bethgelab/stylize-datasets](#): a script to stylize arbitrary datasets through Adaptive Instance Normalization (AdaIN).
- 🔗 ☆ 100+ [rgeirhos/shortcut-perspective](#): Python code to reproduce shortcut learning in neural networks.
- 🔗 ★ 100+ [rgeirhos/academic-cv-publications](#): a simple $\text{\LaTeX}$ template to generate a highly customised list of publications using BibTeX entries (developed for this very CV).
- 🔗 ★ 50+ [rgeirhos/generalisation-humans-DNNs](#): code and psychophysical data for 16-class-ImageNet, a dataset for comparing human and machine classification decisions.
- 🔗 ★ 50+ [rgeirhos/dataset-pruning-metris](#): metrics for smart dataset pruning, resulting in training efficiency gains (and thus carbon savings) of about 20% without loss of performance.
- 🔗 ★ 25+ [google-research/fooling-feature-visualizations](#): adversarial model manipulation technique to fool feature visualizations, a widely used interpretability tool.
- 🔗 ★ 10+ [google-deepmind/visual-memory](#): fast nearest neighbor search and analysis techniques including memory pruning to improve a deep neural network based visual memory.

Talks

08/2025  Google DeepMind horizon talk, Mountain View

05/2025  Keynote at Boehringer Ingelheim Data Science Conference

04/2025  Kriegeskorte Lab, Columbia University

12/2024  Keynote at NeurIPS Workshop on Attributing Model Behavior at Scale, Vancouver

11/2024  Keynote at BMVC Workshop on Robust Recognition in the Open World, Glasgow

10/2024  Centre for Integrative and Applied Neuroscience, York University

09/2024  Waymo, Mountain View

05/2024  VSS 2024 Oral, St. Pete Beach

02/2024  Google DeepMind research week plenary session, Mountain View

01/2024  Cognitive Science Speaker Series, York University

11/2023  Google DeepMind foundational research summit, London

11/2023  Gatsby Computational Neuroscience Unit, University College London

10/2023  Interpretability Analysis Community Meeting, London

09/2023  Vision Seminar, University of Illinois Urbana-Champaign

07/2023  Clinical AI Journal Club, University College London

07/2023  German Dissertation Award Finalists, Körber-Stiftung

05/2023  Gesellschaft für Informatik Dissertation Award Finalists, Schloss Dagstuhl

06/2022  RIKEN-AIP TrustML seminar, Tokyo

06/2022  Institute for Adaptive and Neural Computation, University of Edinburgh

05/2022  NYU Vision Journal Club, New York University & Flatiron Institute

05/2022  VSS 2022 Oral, St. Pete Beach

04/2022  NCT Data Science Seminar, DKFZ ([recording](#))

03/2022  Neural Networks Colloquium, University of Tübingen

02/2022  Apple Machine Learning Research Seminar, Cupertino

12/2021  NeurIPS 2021 Oral, Sydney

09/2021  Brain & AI meeting, Facebook AI Research, New York

12/2020  NeurIPS 2020 SVRHM Workshop Oral ([recording](#))

07/2020  AI Lunch Series, Jefferson National Laboratory

07/2020  Current Topics in Perception and Cognition Colloquium, Giessen University

05/2019  VSS 2019 Oral, St. Pete Beach

05/2019  Center for Perceptual Systems, University of Texas at Austin

05/2019  ICLR 2019 Oral, New Orleans ([recording](#))

03/2019  AI Meetup, Hamburg

08/2017  Neural Networks Colloquium, University of Tübingen

08/2016  Perceiving Systems, Max Planck Institute for Intelligent Systems

Awards & Scholarships

2023	ELLIS PhD Award for outstanding European machine learning dissertation <i>ELLIS</i>
2022	Outstanding Paper Award for “Beyond neural scaling laws: beating power law scaling via data pruning” <i>NeurIPS</i>
2022	Dissertation Award <i>University of Tübingen</i>
2013 – 2022	e-fellows.net Scholarship <i>Awarded for outstanding academic achievements & engagement</i>
2018 – 2021	Ph.D. Scholarship <i>International Max Planck Research School for Intelligent Systems</i>
2020	Elsevier/Vision Research Travel Award
2019	ICLR Travel Award
2018	NeurIPS Travel Award
2017	German National Scholarship (Deutschlandstipendium) <i>University of Tübingen</i>
2017	Erasmus+ Mobility Stipend <i>University of Amsterdam</i>
2015	Erasmus+ Mobility Stipend <i>University of Glasgow</i>
2015	Lilli Zapf Award <i>Acknowledges commitment to social initiative and tolerance</i>
2012	Award of the City of Tett nang <i>Acknowledges outstanding academic achievements</i>

Publications

Peer-reviewed articles

Internò, C., [Geirhos, R.](#), Olhofer, M., Liu, S., Hammer, B., & Klindt, D. (2025). [AI-generated video detection via perceptual straightening](#). In *Advances in Neural Information Processing Systems* 38.

[Spotlight] Hewitt, J., [Geirhos, R.](#), & Kim, B. (2025). [We Can’t Understand AI Using our Existing Vocabulary](#). In *International Conference on Machine Learning*.

[Geirhos, R.](#), Jaini, P., Stone, A., Medapati, S., Yi, X., Toderici, G., ... Shlens, J. (2025). [Towards flexible perception with visual memory](#). In *International Conference on Machine Learning*. [\[code\]](#)

Li, F., Klein, T., Brendel, W., [Geirhos, R.](#), & Zimmermann, R. S. (2025). [LAION-C: An out-of-distribution benchmark for web-scale vision models](#). In *International Conference on Machine Learning*. [\[code\]](#)

Gavrikov, P., Lukasik, J., Jung, S., [Geirhos, R.](#), Lamm, B., Mirza, M. J., ... Keuper, J. (2025). [Can we talk models into seeing the world differently?](#) In *International Conference on Learning Representations*. [\[code\]](#)

Stone, A., Soltau, H., [Geirhos, R.](#), Yi, X., Xia, Y., Cao, B., ... Shlens, J. (2025). [Learning Visual Composition through Improved Semantic Guidance](#). In *Conference on Computer Vision and Pattern Recognition*.

[Spotlight] Jaini, P., Clark, K., & [Geirhos, R.](#) (2024). [Intriguing properties of generative classifiers](#). In *International Conference on Learning Representations*.

Ahlert, J., Klein, T., Wichmann, F. A., & [Geirhos, R.](#) (2024). [How aligned are different alignment metrics?](#) In *ICLR 2024 Workshop on Representational Alignment*.

[Geirhos, R.](#), Zimmermann, R. S., Bilodeau, B., Brendel, W., & Kim, B. (2024). [Don’t trust your eyes: on the \(un\) reliability of feature visualizations](#). In *International Conference on Machine Learning*. [\[code\]](#)

- Sucholutsky, I., Muttenthaler, L., Weller, A., Peng, A., Bobu, A., Kim, B., ... others (2023). [Getting aligned on representational alignment](#). *Transactions on Machine Learning Research*.
- Dehghani, M., Mustafa, B., Djolonga, J., Heek, J., Minderer, M., Caron, M., ... others (2023). [Patch n’Pack: NaViT, a vision transformer for any aspect ratio and resolution](#). In *Advances in Neural Information Processing Systems* 36.
- Wichmann, F. A., Kornblith, S., & Geirhos, R. (2023). [Neither hype nor gloom do DNNs justice](#). *Behavioral and Brain Sciences*, 46, e412.
- [Oral]** Dehghani, M., Djolonga, J., Mustafa, B., Padlewski, P., Heek, J., Gilmer, J., ... others (2023). [Scaling vision transformers to 22 billion parameters](#). In *International Conference on Machine Learning*.
- Wichmann, F. A., & Geirhos, R. (2023). [Are deep neural networks adequate behavioral models of human visual perception?](#) *Annual Review of Vision Science*, 9.
- Huber, L. S., Geirhos, R., & Wichmann, F. A. (2023). [The developmental trajectory of object recognition robustness: Children are like small adults but unlike big deep neural networks](#). *Journal of Vision*, 23(7). [code]
- [Award]** Sorscher, B., Geirhos, R., Shekhar, S., Ganguli, S., & Morcos, A. S. (2022). [Beyond neural scaling laws: beating power law scaling via data pruning](#). In *Advances in Neural Information Processing Systems* 35. [code | data]
- Meding, K., Buschhoff, L. M. S., Geirhos, R., & Wichmann, F. A. (2022). [Trivial or impossible—dichotomous data difficulty masks model differences \(on ImageNet and beyond\)](#). *International Conference on Learning Representations*. [code]
- [Oral]** Geirhos, R., Narayanappa, K., Mitzkus, B., Thieringer, T., Bethge, M., Wichmann, F. A., & Brendel, W. (2021). [Partial success in closing the gap between human and machine vision](#). In *Advances in Neural Information Processing Systems* 34. [code]
- [Spotlight]** Zimmermann, R. S., Borowski, J., Geirhos, R., Bethge, M., Wallis, T. S. A., & Brendel, W. (2021). [How well do feature visualizations support causal understanding of CNN activations?](#) In *Advances in Neural Information Processing Systems* 34. [code]
- Huber, L. S., Geirhos, R., & Wichmann, F. A. (2021). [Out-of-distribution robustness: Limited image exposure of a four-year-old is enough to outperform ResNet-50](#). In *NeurIPS Workshop on Shared Visual Representations in Human & Machine Intelligence*. [code]
- Borowski, J., Zimmermann, R., Schepers, J., Geirhos, R., Wallis, T. S. A., Bethge, M., & Brendel, W. (2021). [Exemplary natural images explain CNN activations better than feature visualizations](#). *International Conference on Learning Representations*.
- [Oral]** Geirhos, R., Narayanappa, K., Mitzkus, B., Bethge, M., Wichmann, F. A., & Brendel, W. (2020). [On the surprising similarities between supervised and self-supervised models](#). In *NeurIPS Workshop on Shared Visual Representations in Human & Machine Intelligence*.
- Geirhos, R., Jacobsen, J.-H., Michaelis, C., Zemel, R., Brendel, W., Bethge, M., & Wichmann, F. A. (2020b). [Shortcut learning in deep neural networks](#). *Nature Machine Intelligence*, 2, 665–673. [code]
- Geirhos, R., Meding, K., & Wichmann, F. A. (2020). [Beyond accuracy: quantifying trial-by-trial behaviour of CNNs and humans by measuring error consistency](#). In *Advances in Neural Information Processing Systems* 33. [code]

- [**Oral**] Geirhos, R., Rubisch, P., Michaelis, C., Bethge, M., Wichmann, F. A., & Brendel, W. (2019). [ImageNet-trained CNNs are biased towards texture; increasing shape bias improves accuracy and robustness.](#) In *International Conference on Learning Representations*. [[models](#) | [dataset](#)]
- Michaelis, C., Mitzkus, B., Geirhos, R., Rusak, E., Bringmann, O., Ecker, A. S., ... Brendel, W. (2019). [Benchmarking robustness in object detection: autonomous driving when winter is coming.](#) In *NeurIPS Workshop on Machine Learning for Autonomous Driving*. [[benchmark](#) | [library](#)]
- Geirhos, R., Medina Temme, C. R., Rauber, J., Schütt, H. H., Bethge, M., & Wichmann, F. A. (2018). [Generalisation in humans and deep neural networks.](#) In *Advances in Neural Information Processing Systems 31* (pp. 7548–7560). [[code](#)]
- Wichmann, F. A., Janssen, D. H., Geirhos, R., Aguilar, G., Schütt, H. H., Maertens, M., & Bethge, M. (2017). [Methods and measurements to compare men against machines.](#) *Electronic Imaging, Human Vision and Electronic Imaging, 2017*(14), 36–45.

Preprints

- Wiedemer, T., Li, Y., Vicol, P., Gu, S. S., Matarese, N., Swersky, K., ... Geirhos, R. (2025). [Video models are zero-shot learners and reasoners.](#) *arXiv preprint arXiv:2509.20328*. [[website](#)]
- Hewitt, J., Tafjord, O., Geirhos, R., & Kim, B. (2025). [Neologism Learning for Controllability and Self-Verbalization.](#) *arXiv preprint arXiv:2510.08506*.
- Comanici, G., Bieber, E., Schaekermann, M., Pasupat, I., Sachdeva, N., Dhillon, I., ... others (2025). [Gemini 2.5: Pushing the frontier with advanced reasoning, multimodality, long context, and next generation agentic capabilities.](#) *arXiv preprint arXiv:2507.06261*.
- Phan, L., Gatti, A., Han, Z., Li, N., Hu, J., Zhang, H., ... others (2025). [Humanity’s Last Exam.](#) *arXiv preprint arXiv:2501.14249*. [[website](#) | [Wikipedia article](#)]
- Motamed, S., Culp, L., Swersky, K., Jaini, P., & Geirhos, R. (2025). [Do generative video models learn physical principles from watching videos?](#) *arXiv preprint arXiv:2501.09038*. [[code](#) | [website](#)]
- Haghiri, S., Rubisch, P., Geirhos, R., Wichmann, F., & von Luxburg, U. (2019). [Comparison-based framework for psychophysics: lab versus crowdsourcing.](#) *arXiv preprint arXiv:1905.07234*.
- Geirhos, R., Janssen, D. H., Schütt, H. H., Rauber, J., Bethge, M., & Wichmann, F. A. (2017). [Comparing deep neural networks against humans: object recognition when the signal gets weaker.](#) *arXiv preprint arXiv:1706.06969*. [[code](#)]

Conference abstracts

- [**Oral**] Geirhos, R., Clark, K., & Jaini, P. (2024). [Learning to discriminate by learning to generate: zero-shot generative models increase human object recognition alignment.](#) *Journal of Vision, 24*(10).
- [**Oral**] Geirhos, R., Narayanappa, K., Mitzkus, B., Thieringer, T., Bethge, M., Wichmann, F. A., & Brendel, W. (2022). [The bittersweet lesson: data-rich models narrow the behavioural gap to human vision.](#) *Journal of Vision, 22*(14), 3273–3273.
- [**Oral**] Huber, L., Geirhos, R., & Wichmann, F. A. (2021). [The developmental trajectory of object recognition robustness: comparing children, adults, and CNNs.](#) *Journal of Vision, 21*(9), 1967.

Geirhos, R., Jacobsen, J.-H., Michaelis, C., Zemel, R., Brendel, W., Bethge, M., & Wichmann, F. A. (2020a). [Unintended cue learning: Lessons for deep learning from experimental psychology](#). *Journal of Vision*, 20(11), 652–652.

[Oral] [Geirhos, R., Rubisch, P., Rauber, J., Medina Temme, C. R., Michaelis, C., Brendel, W., ... Wichmann, F. A. \(2019\). Inducing a human-like shape bias leads to emergent human-level distortion robustness in CNNs](#). *Journal of Vision*, 19(10), 209c–209c.

[Geirhos, R., Janssen, D., Schütt, H., Bethge, M., & Wichmann, F. \(2017\). Of human observers and deep neural networks: A detailed psychophysical comparison](#). *Journal of Vision*, 17(10), 806–806.

Butz, M. V., [Geirhos, R.](#), & Kneissler, J. (2015). [An automatized Heider-Simmel story generation tool](#). In *Proceedings of the 37th Annual Meeting of the Cognitive Science Society (CogSci)*, Pasadena, California, USA, July 22-25, 2015. [[website & code](#)]

Doctoral dissertation

[Award] [Geirhos, R. \(2022\). To err is human? A functional comparison of human and machine decision-making](#). *University of Tübingen*.

Recognized with the European [ELLIS PhD award](#), the University of Tübingen’s 2022 dissertation award, and named an “outstanding dissertation” by the German Society for Computer Science (GI).

Selected media coverage

My work was featured in print ([The Economist](#), [New York Times](#), [FAZ](#), [Spektrum der Wissenschaft](#)), online (e.g. [Quanta Magazine](#), [Knowable Magazine](#)), radio ([SWR](#)), YouTube ([DeepMind’s AI Just Solved Video Generation In A Way Nobody Expected](#) [234K views], [Do Neural Networks Need To Think Like Humans?](#) [48K views], [Finally, DeepMind made an IQ test for AIs!](#) [64K views]), & podcast ([Underrated ML](#)).

Additionally, I have written articles for [The Gradient](#) ([Shortcuts: How Neural Networks Love to Cheat](#)), [Towards Data Science](#) ([Are all CNNs created equal?](#)), [Medium](#) ([Out of shape? Why deep learning works differently than we thought](#)) and the [Machine Learning for Science Blog](#) ([Do machines see like humans? They are getting closer](#)).

Professional activities & Service

Organizer	ICCV Physics-IQ × Perception Test Challenge, 2025
Assessor	External examiner, dissertation of Thomas Fel Toulouse/Brown Grant reviewer & subject-matter expert for MacArthur Foundation (\$800K / fellowship) Grant reviewer for UK Research & Innovation (£2M / grant) Grant reviewer for Israeli Science Foundation (ILS 1M / grant) Grant reviewer for CAHSI-Google Institutional Research Program (\$80K / grant) Annual project evaluator for BWKI , Germany’s national AI school competition
Committees	Professorship Appointment Committee “Computer Science & Didactics”, Tübingen Professorship Interim Evaluation Committee “Big Data Visual Analytics”, Tübingen
Panelist	Attributing Model Behavior at Scale, NeurIPS 2024, Vancouver Career transitions panel, VSS 2024, St. Pete Beach, Florida “Artificial stupidity? On accidents and deceptions of technical intelligence”, Dresden
Teaching	Annual tutorial on Rebuttal Writing Max Planck Research School for Intelligent Systems Interdisciplinary seminar on Artificial Intelligence & Legal Tech University of Tübingen
Reviewing	NeurIPS (<i>Outstanding Reviewer Award</i> , 2020) Journal of Vision (2× <i>Exceptionally Good Review</i> , 2021) ICLR Nature Machine Intelligence Nature Human Behaviour ICML PLOS Computational Biology ICCV WACV ICLR 2024–2025 workshop on Representational Alignment CVPR 2024 workshop on Test-Time Adaptation NeurIPS 2022 workshop on Distribution Shifts NeurIPS 2019–2022 workshop on Shared Visual Representations in Humans & Machines Computer Vision and Image Understanding AISTATS (emergency reviewer)
PC Member	Program Committee ICML 2020 “Uncertainty & Robustness in Deep Learning” workshop
Mentor	FoVeA network (Females of Vision et al.), 2024

Mentoring & Supervision

Interns & Lab rotat.	Thaddäus Wiedemer Google DeepMind Toronto <i>“Video models are zero-shot learners and reasoners”</i>
	Saman Motamed Google DeepMind Toronto <i>“Do generative video models understand physical principles?”</i>
	Ole Jonas Wenzel GTC Tübingen <i>“Imperceptible signals in perceptible noise”</i>
	Shuchen Wu ETH Zürich <i>“An early vision-inspired visual recognition model”</i>
	Benjamin Mitzkus University of Tübingen <i>“Benchmarking robustness in object detection”</i> (co-advised)
	Patricia Rubisch University of Tübingen <i>“Comparison-based framework for psychophysics: lab versus crowdsourcing”</i>
M.Sc. theses	Fanfei Li Max Planck Institute for Intelligent Systems <i>“LAION-C: An out-of-distribution benchmark for web-scale vision models”</i> (co-advised)
	Lukas Huber University of Bern <i>“An onto- and phylogenetically inspired approach to machine vision”</i>
	Benjamin Mitzkus University of Tübingen <i>“Meta-learning robustness”</i> (co-advised)
B.Sc. theses	Jannis Ahlert University of Tübingen <i>“How aligned are different alignment metrics?”</i> (co-advised)
	Tizian Thieringer University of Tübingen <i>“Benchmarking the latest machine vision developments against human categorization performance”</i>

Languages

English	full professional proficiency I’ve worked in English-speaking environments for a decade.
German	native speaker Deutsch ist meine Muttersprache.
French	good command Je parlais très bien le français, mais maintenant j’ai peu de pratique.
Bengali	basic আমি একবছর কলকাতায় বাংলা বলতে এবং লিখতে শিখেছি।
Spanish	basic Estoy aprendiendo algo de español.