## List of Publications

## **Journal Articles**

1. Hedström A, Bommer P L, Burns T F, **Lapuschkin S**, Samek W and Höhne M-C M (2025).

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10. Ma J, Schneider L, **Lapuschkin S**, Achtibat R, Durchrau M, Krois J, Schwendicke F and Samek W (2022). "Towards Trustworthy AI in Dentistry".

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"Finding and Removing Clever Hans: Using Explanation Methods to Debug and Improve Deep Models". In: *Information Fusion* 77:261–295

14. Sun J, Lapuschkin S, Samek W and Binder A (2022).

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19. Hägele M, Seegerer P, **Lapuschkin S**, Bockmayr M, Samek W, Klauschen F, Müller K-R and Binder A (2020).

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"iNNvestigate Neural Networks!".

In: Journal of Machine Learning Research 20(93):1–8.

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21. Lapuschkin S, Wäldchen S, Binder A, Montavon G, Samek W and Müller K-R (2019).

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"Explaining the Unique Nature of Individual Gait Patterns with Deep Learning".

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23. Montavon G, Lapuschkin S, Binder A, Samek W and Müller K-R (2017).

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24. Samek W, Binder A, Montavon G, Lapuschkin S, and Müller K-R (2017).

"Evaluating the Visualization of what a Deep Neural Network has Learned".

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25. Sturm I, Lapuschkin S, Samek W and Müller K-R (2016).

 $\hbox{``Interpretable Deep Neural Networks for Single-Trial EEG Classification''}.$ 

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26. Lapuschkin S, Binder A, Montavon G, Müller K-R and Samek W (2016).

"The Layer-wise Relevance Propagation Toolbox for Artificial Neural Networks".

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## **Contributions to Conference Proceedings and Workshops**

- 1. Pahde F, Dreyer M, Weckbecker M, Weber L, Anders C J, Wiegand T, Samek W and **Lapuschkin S** (2025). "Navigating Neural Space: Revisiting Concept Activation Vectors to Overcome Directional Divergence". In: *Proceedings of the International Conference on Learning Representations (ICLR)* TBA. https://github.com/frederikpahde/pattern-cav
- 2. Bareeva D, Yolcu GÜ, Hedström A, Wiegand T, Samek W Lapuschkin S (2024). "Quanda: An Interpretability Toolkit for Training Data Attribution Evaluation and Beyond". In: NeuRIPS 2024 Workshop on Attributing Model Behavior at Scale (ATTRIB 2024). https://github.com/dilyabareeva/quanda
- 3. Naujoks J R, Krasowski A, Weckbecker M, Wiegand T, **Lapuschkin S**, Samek W and Klausen R P (2024). "PINNfluence: Influence Functions for Physics-Informed Neural Networks". In: NeuRIPS 2024 Workshop on Machine Learning and the Physical Sciences (ML4PS). https://github.com/aleks-krasowski/PINNfluence Reproducibility Badge Winner
- 4. Kopf L, Bommer P L, Hedström A, **Lapuschkin S**, Höhne M M-C and Bykov K (2024). "CoSy: Evaluating Textual Explanations of Neurons". In: *Advances in Neural Information Processing Systems* (*NeuRIPS*) 34656–34685. (*OpenReview*) https://github.com/lkopf/cosy
- Nobis G, Springenberg M, Aversa M, Detzel M, Daems R, Murray-Smith R, Nakajima S, Lapuschkin S, Ermon S, Birdal T, Opper M, Knochenhauer C, Oala L and Samek W (2024).
  "Generative Fractional Diffusion Models".
  In: Advances in Neural Information Processing Systems (NeuRIPS) 25469–25509. (OpenReview)
- 6. Mekala R R, Pahde F, Baur S, Chandrashekar S, Diep M, Wenzel M A, Wisotzky E L, Yolcu G Ü, **Lapuschkin S**, Ma J, Eisert P, Lindvall M, Porter A and Samek W (2024). "Synthetic Generation of Dermatoscopic Images with GAN and Closed-Form Factorization". In: ECCV 2024 Workshop on Synthetic Data for Computer Vision (Synthetic Data4CV) TBA. (Green Open
- 7. Achtibat R, Hatefi S M V, Dreyer M, Jain A, Wiegand T, **Lapuschkin S**, Samek W (2024). "AttnLRP: Attention-Aware Layer-wise Relevance Propagation for Transformers". In: *Proceedings of the 41st International Conference on Machine Learning (ICML)* 135–168.

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- 8. Hatefi S M V, Dreyer M, Achtibat R, Wiegand T, Samek W and **Lapuschkin S** (2024). "Pruning By Explaining Revisited: Optimizing Attribution Methods to Prune CNNs and Transformers". In: *Proceedings of the European Conference on Computer Vision (ECCV) Workshops* 152–169. (*Green Open Access*)
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- Hedström A, Weber L, Lapuschkin S, Höhne M M-C (2024).
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- 10. Tinauer C, Damulina A, Sackl M, Soellradl M, Achtibat R, Dreyer M, Pahde F, **Lapuschkin S**, Schmidt R, Ropele S, Samek W, Langkammer C (2024).
  - "Explainable Concept Mappings of MRI: Revealing the Mechanisms Underlying Deep Learning-based Brain Disease Classification".
  - In: Proceedings of the 2nd XAI World Conference 202–216. (Green Open Access)
- 11. Dreyer M, Purelku E, Vielhaben J, Samek W, **Lapuschkin S** (2024). "PURE: Turning Polysemantic Neurons Into Pure Features by Identifying Relevant Circuits". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops* 8212–8217.
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- 12. Bareeva D, Dreyer M, Pahde F, Samek W and Lapuschkin S (2024).
  - "Reactive Model Correction: Mitigating Harm to Task-Relevant Features via Conditional Bias Suppression".
  - In: Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops 3532–3541.
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- 13. Dreyer M, Achtibat R, Samek W and Lapuschkin S (2024).

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14. Dreyer M, Pahde F, Anders C J, Samek W and Lapuschkin S (2024).

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18. Pahde F, Dreyer M, Samek W and Lapuschkin S (2023).

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20. Dreyer M, Achtibat R, Wiegand T, Samek W and Lapuschkin S (2023).

"Revealing Hidden Context Bias in Segmentation and Object Detection through Concept-specific Explanations".

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27. Goh G S W, Lapuschkin S, Weber L, Samek W and Binder A (2021).

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- 29. Sun J, **Lapuschkin S**, Samek W and Binder A (2020).

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- 30. Anders C J, Neumann D, Marinč T, Samek W, Müller K-R and **Lapuschkin S** (2020). "XAI for Analyzing and Unlearning Spurious Correlations in ImageNet". In: *XXAI: Extending Explainable AI Beyond Deep Models and Classifiers. ICML Workshop*
- 31. Sun J, **Lapuschkin S**, Samek W, Zhao Y, Cheung N-M and Binder A (2020). "Explain and Improve: Cross-Domain-Few-Shot-Learning Using Explanations". In: *XXAI: Extending Explainable AI Beyond Deep Models and Classifiers. ICML Workshop*
- 32. Alber M, **Lapuschkin S**, Seegerer P, Hägele M, Schütt K T, Montavon G, Samek W, Müller K-R, Dähne S and Kindermans P-J (2018).

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"Understanding and Comparing Deep Neural Networks for Age and Gender Classification". In: *Proceedings of the ICCV'17 Workshop on Analysis and Modeling of Faces and Gestures (AMFG)* 2017:1629-1638

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37. **Lapuschkin S**, Binder A, Montavon G, Müller K-R and Samek W (2016).

"Analyzing Classifiers: Fisher Vectors and Deep Neural Networks".

In: Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2016:2912-2920

38. Montavon G, **Bach S**, Binder A, Samek W and Müller K-R (2016).

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#### Books

1. Longo L, **Lapuschkin S** and Seifert C, editors (2024).

"Explainable Artificial Intelligence (Second World Conference, xAI 2024, Valletta, Malta, July 17–19, 2024, Proceedings, Part I-IV)".

Springer (Cham), Part I ISBN: 978-3-031-63787-2. Part II ISBN: 978-3-031-63797-1.

Part III ISBN: 978-3-031-63800-8. Part IV ISBN: 978-3-031-63803-9

# **Book Chapters**

1. Becking D, Dreyer M, Samek W, Müller K and Lapuschkin S (2022).

"ECQx: Explainability-Driven Quantization for Low-Bit and Sparse DNNs".

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2. Montavon G, Binder A, Lapuschkin S, Samek W and Müller K-R (2019).

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3. Binder A, **Bach S**, Montavon G, Müller K-R and Samek W (2016).

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"Layer-wise Relevance Propagation for Neural Networks with Local Renormalization Layers".

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## **Preprints**

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2. Dreyer M, Hufe L, Berend J, Wiegand T, Lapuschkin S and Samek W (2025).

"From What to How: Attributing CLIP's Latent Components Reveals Unexpected Semantic Reliance". In: CoRR abs/2505.20229.

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3. Kahardipraja P, Achtibat R, Wiegand T, Samek W and Lapuschkin S (2025).

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5. Hatefi S M V, Dreyer M, Achtibat R, Kahardipraja P, Wiegand T, Samek W and **Lapuschkin S** (2025). "Attribution-guided Pruning for Compression, Circuit Discovery, and Targeted Correction in LLMs". In: *OpenReview:* YKF9pMAXRv

6. Bareeva D, Höhne M M C, Warnecke A, Pirch L, Müller K-R, Rieck K, **Lapuschkin S** and Bykov K (2025). "Manipulating Feature Visualizations with Gradient Slingshots".

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7. Zverev E, Kortukov E, Panfilov A, Volkova A, Tabesh S, **Lapuschkin S**, Samek W and Lampert C H (2025).

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9. Erogullari E, **Lapuschkin S**, Samek W and Pahde F (2025).

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10. Puri B, Jain A, Golimblevskaia E, Kahardipraja P, Wiegand T, Samek W and Lapuschkin S (2025).

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13. Dreyer M, Berend J, Labarta T, Vielhaben J, Wiegand T, Lapuschkin S and Samek W (2025).

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 $In: CoRR\ abs/2106.13200.\ \ https://github.com/chr5tphr/zennit \ |$ 

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