

*Curriculum Vitae*

**SJOERD VAN STEENKISTE**

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**EDUCATION**

PhD in Informatics (Artificial Intelligence) Nov 2020  
Thesis: “Learning Structured Neural Representations for Visual Reasoning Tasks”  
Advisor: Jürgen Schmidhuber  
Internal Committee: Cesare Alippi, Natasha Sharygina  
External Committee: Leslie Kaelbling, Michael Mozer, Bernhard Schölkopf  
Dalle Molle Institute for Artificial Intelligence (IDSIA)  
(via Università della Svizzera italiana, USI, Switzerland)

MSc *summa cum laude* in Artificial Intelligence Mar 2016  
Maastricht University, Netherlands

MSc *summa cum laude* in Operations Research Jul 2015  
Maastricht University, Netherlands

BSc *cum laude* in Knowledge Engineering Jul 2013  
Maastricht University, Netherlands

**ACADEMIC POSITIONS**

Postdoctoral Researcher, Dalle Molle Institute for Artificial Intelligence (IDSIA) Jan 2021 - Sep 2021

**INDUSTRY POSITIONS**

Senior Research Scientist, Google Research, Mountain View, USA May 2025 - *present*

Research Scientist, Google Research, Mountain View, USA Sept 2022 - Apr 2025

Research Scientist, Google Research, Stockholm, Sweden Nov 2021 - Sept 2022

Scientific Advisor (part-time), AtonRâ Partners Jan 2015 - Aug 2021

Student Researcher, Google Brain Sep 2020 - Dec 2020

Research Intern, Google Brain Mar 2018 - Aug 2018

Research Intern, NNAISENSE Apr 2016 - June 2016

Research Intern, AtonRâ Partners July 2014 - Dec 2014

## HONORS

NVAIL Pioneering Research Award	Dec 2017
Maastricht University Student Prize	Nov 2015

## BEST PAPER AWARDS

Outstanding paper award (with M. Chang, K. Greff, and J. Schmidhuber) NIPS Workshop on Cognitively Informed Artificial Intelligence	Dec 2017
Best master thesis award in Operations Research Department of Knowledge Engineering, Maastricht University	Jul 2015
Best bachelor thesis award (2 <sup>nd</sup> ) in Knowledge Engineering Department of Knowledge Engineering, Maastricht University	Jul 2013

## GRANTS

Grant proposal “NEUSYM” (SNF project 200021_192356) Developed with two collaborators, which was awarded to Jürgen Schmidhuber by the Swiss National Science Foundation, funded to the tune of 670'000 CHF (about 700K USD)	Mar 2020
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## PROFESSIONAL ACTIVITIES

### ORGANIZATION

Workshop Co-organizer (with Shravan Nayak, Mehar Bhatia, Qian Yang, Kanishk Jain, Rabiul Awal, David Adelani, Spandana Gella, Siva Reddy, Vered Shwartz, Yash Goyal, Karolina Stanczak, Aishwarya Agrawal), “Vision Language Models For All: Building Geo-Diverse and Culturally Aware Vision-Language Models”, <i>Conference on Computer Vision and Pattern Recognition (CVPR)</i>	June 2025
Workshop Co-organizer (with William Agnew, Rim Assouel, Michael Chang, Antonia Creswell, Eliza Kosoy, Aravind Rajeswaran), “Object Representations for Learning and Reasoning”, <i>Neural Information Processing Systems (NeurIPS)</i>	Dec 2020
Workshop Co-organizer (with Sungjin An, Adam Kosiorek, Jessica Hamrick, Yoshua Bengio), “Object-Oriented Learning: Perception, Representation, and Reasoning”, <i>International Conference on Machine Learning (ICML)</i>	Jul 2020

### REVIEWING

Conference Senior Area Chair: ICLR 2025
Conference Area Chair: ICLR 2024, ICML 2024, NeurIPS 2024 (D&B Track), ICML 2025
Conference Reviewer: ICML 2019 ( <i>top 5% reviewer</i> ), NeurIPS 2019 ( <i>top 400 reviewer</i> ), ICML 2020 ( <i>top 33% reviewer</i> ), NeurIPS 2020 ( <i>top 10% reviewer</i> ), ICLR 2021 ( <i>reviewer award</i> ), ICML 2021 ( <i>expert reviewer, top 10% reviewer</i> ), NeurIPS 2021, ICLR 2022 ( <i>highlighted reviewer</i> ), ICML 2022, NeurIPS 2022, NeurIPS 2022 Workshop proposals, ICML 2023, NeurIPS 2023 ( <i>top reviewer</i> ), CVPR 2025,

ICCV 2025

Journal Reviewer: IEEE RA-L 2021, IJCV 2021, TMLR 2022–2023, IEEE TPAMI 2023

Grant Expert Reviewer: NSC Poland PRELUDIUM 2021

#### VOLUNTEERING

“Newcomer’s Initiative”, *International Conference on Machine Learning (ICML)* Jul 2020

#### PARTICIPATION

Conference on Deep Learning and the Brain, The Edmond and Lily Safra Center for Brain Sciences, Hebrew University of Jerusalem, Jerusalem, Israel Jan 2019

Machine Learning Summer School, Max Planck Institute for Intelligent Systems, Tübingen, Germany Jun 2017

#### JOURNAL ARTICLES

- [3] Gopalakrishnan, A., Irie, K., Schmidhuber, J. & **van Steenkiste**, S. “Unsupervised Learning of Temporal Abstractions with Slot-based Transformers”. *Neural Computation* 35.4 (2023), pp. 593–626.
- [2] Karel, J. M., **van Steenkiste**, S. & Peeters, R. L. “The Design of Matched Balanced Orthogonal Multiwavelets”. *Frontiers in Applied Mathematics and Statistics* (2022), p. 84.
- [1] **van Steenkiste**, S., Kurach, K., Schmidhuber, J. & Gelly, S. “Investigating object compositionality in generative adversarial networks”. *Neural Networks* 130 (2020), pp. 309–325.

#### REFEREED CONFERENCE PROCEEDINGS

\* = equal (technical) contribution, † = equal advising

- [22] Sun\*, J., Fu\*, D., Hu\*, Y., Wang, S., Rassin, R., Juan, D.-C., Alon, D., Herrmann, C., **van Steenkiste**, S., Krishna, R. & Rashtchian, C. “Dreamsync: Aligning text-to-image generation with image understanding feedback”. *Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)* (2025).
- [21] **van Steenkiste\***, S., Zoran\*, D., Yang, Y., Rubanova, Y., Kabra, R., Doersch, C., Gokay, D., Heyward, J., Pot, E., Greff, K., Hudson, D., Keck, T. A., Carreira, J., Dosovitskiy, A., Sajjadi, M. S. & Kipf\*, T. “Moving Off-the-Grid: Scene-Grounded Video Representations”. *Advances in Neural Information Processing Systems (NeurIPS)* (2024). **Spotlight Presentation.**
- [20] Wu, Z., Rubanova, Y., Kabra, R., Hudson, D., Gilitschenski, I., Aytar, Y., **van Steenkiste**, S., Allen, K. & Kipf, T. “Neural Assets: 3D-Aware Multi-Object Scene Synthesis with Image Diffusion Models”. *Advances in Neural Information Processing Systems (NeurIPS)* (2024). **Spotlight Presentation.**
- [19] Nayak, S., Jain, K., Awal, R., Siva, R., **van Steenkiste**, S., Hendricks, L. A., Stanczak, K. & Agrawal, A. “Benchmarking Vision Language Models for Cultural Understanding”. *Conference on Empirical Methods in Natural Language Processing (EMNLP)* (2024).
- [18] Eisape, T., Tessler, M., Dasgupta, I., Sha, F., **van Steenkiste**†, S. & Linzen†, T. “A systematic comparison of syllogistic reasoning in humans and language models”. *Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)* (2024).

- [17] Petty, J., **van Steenkiste**, S., Dasgupta, I., Sha, F., Garrette, D. & Linzen, T. “The Impact of Depth on Compositional Generalization in Transformer Language Models”. *Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)* (2024).
- [16] Jabri\*, A., **van Steenkiste\***, S., Hoogeboom, E., Sajjadi, M. S. & Kipf, T. “DORSal: Diffusion for Object-centric Representations of Scenes et al.” *International Conference on Learning Representations (ICLR)* (2024).
- [15] Seitzer, M., **van Steenkiste**, S., Kipf, T., Greff, K. & Sajjadi, M. S. “DyST: Towards Dynamic Neural Scene Representations on Real-World Videos”. *International Conference on Learning Representations* (2024). **Spotlight Presentation.**
- [14] Biza, O., **van Steenkiste**, S., Sajjadi, M. S., Elsayed†, G. F., Mahendran†, A. & Kipf†, T. “Invariant Slot Attention: Object Discovery with Slot-Centric Reference Frames”. *International Conference on Machine Learning (ICML)* (2023).
- [13] Prabhudesai, M., Goyal, A., Paul, S., **van Steenkiste**, S., Sajjadi, M. S., Aggarwal, G., Kipf, T., Pathak, D. & Fragkiadaki, K. “Test-time adaptation with slot-centric models”. *International Conference on Machine Learning (ICML)* (2023).
- [12] Dehghani\*, M., Djolonga\*, J., Mustafa\*, B., Padlewski\*, P., Heek\*, J., Gilmer, J., Steiner, A., Caron, M., Geirhos, R., Alabdulmohsin, I., Jenatton, R., Beyer, L., Tschannen, M., Arnab, A., Wang, X., Riquelme, C., Minderer, M., Puigcerver, J., Evci, U., Kumar, M., **van Steenkiste**, S., Elsayed, G. F., Mahendran, A., Yu, F., Oliver, A., Huot, F., Bastings, J., Collier, M. P., Gritsenko, A., Birodkar, V., Vasconcelos, C., Tay, Y., Mensink, T., Kolesnikov, A., Pavetić, F., Tran, D., Kipf, T., Lučić, M., Zhai, X., Keysers, D., Harmsen, J. & Houlsby\*, N. “Scaling Vision Transformers to 22 Billion Parameters”. *International Conference on Machine Learning (ICML)* (2023). **Oral Presentation.**
- [11] Elsayed\*, G., Mahendran\*, A., **van Steenkiste\***, S., Greff, K., Mozer, M. C. & Kipf\*, T. “Savi++: Towards end-to-end object-centric learning from real-world videos”. *Advances in Neural Information Processing Systems (NeurIPS)* 35 (2022), pp. 28940–28954.
- [10] Sajjadi, M. S., Duckworth\*, D., Mahendran\*, A., **van Steenkiste\***, S., Pavetić, F., Lučić, M., Guibas, L. J., Greff, K. & Kipf\*, T. “Object scene representation transformer”. *Advances in Neural Information Processing Systems (NeurIPS)* 35 (2022), pp. 9512–9524.
- [9] Ramesh, A., Kirsch, L., **van Steenkiste**, S. & Schmidhuber, J. “Exploring through Random Curiosity with General Value Functions”. *Advances in Neural Information Processing Systems (NeurIPS)* 35 (2022), pp. 18733–18748.
- [8] Gopalakrishnan, A., **van Steenkiste**, S. & Schmidhuber, J. “Unsupervised Object Keypoint Learning using Local Spatial Predictability”. *International Conference on Learning Representations (ICLR)* (2021). **Spotlight Presentation.**
- [7] Csordás, R., **van Steenkiste**, S. & Schmidhuber, J. “Are Neural Nets Modular? Inspecting Functional Modularity Through Differentiable Weight Masks”. *International Conference on Learning Representations (ICLR)* (2021).
- [6] Stanić, A., **van Steenkiste**, S. & Schmidhuber, J. “Hierarchical relational inference”. *Proceedings of the AAAI Conference on Artificial Intelligence* 35.11 (2021), pp. 9730–9738.

- [5] Kirsch, L., **van Steenkiste**, S. & Schmidhuber, J. “Improving Generalization in Meta Reinforcement Learning using Learned Objectives”. *International Conference on Learning Representations (ICLR)* (2020). **Spotlight Presentation**.
- [4] **van Steenkiste**, S., Locatello, F., Schmidhuber, J. & Bachem, O. “Are disentangled representations helpful for abstract visual reasoning?” *Advances in Neural Information Processing Systems (NeurIPS)* 32 (2019).
- [3] **van Steenkiste**, S., Chang, M., Greff, K. & Schmidhuber, J. “Relational neural expectation maximization: Unsupervised discovery of objects and their interactions”. *International Conference on Learning Representations (ICLR)* (2018).
- [2] Greff\*, K., **van Steenkiste\***, S. & Schmidhuber, J. “Neural expectation maximization”. *Advances in Neural Information Processing Systems (NIPS)* 30 (2017).
- [1] **van Steenkiste**, S., Koutník, J., Driessens, K. & Schmidhuber, J. “A wavelet-based encoding for neuroevolution”. *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO) 2016* (2016), pp. 517–524.

## REFEREED WORKSHOP PAPERS

\* = equal (technical) contribution, † = equal advising

- [15] Qiu, L., Sha, F., Allen, K., Kim, Y., Linzen, T. & **van Steenkiste**, S. “Can Language Models Perform Implicit Bayesian Inference Over User Preference States?” *NeurIPS Workshop on System-2 Reasoning at Scale* (2024).
- [14] Petty, J., **van Steenkiste**, S. & Linzen, T. “How Does Code Pretraining Affect Language Model Task Performance?” *EMNLP BlackboxNLP Workshop* (2024).
- [13] Wu, Y.-F., Greff, K., Elsayed, G. F., Mozer, M. C., Kipf, T. & **van Steenkiste**, S. “Inverted-Attention Transformers can Learn Object Representations: Insights from Slot Attention”. *NeurIPS Workshop on Unifying Representations in Neural Models & NeurIPS Workshop on Causal Representation Learning* (2023).
- [12] Biza, O., **van Steenkiste**, S., Sajjadi, M. S., Elsayed, G. F., Mahendran†, A. & Kipf†, T. “Spatial Symmetry in Slot Attention”. *NeurIPS Workshop on Symmetry and Geometry in Neural Representations* (2022).
- [11] Prabhudesai, M., Paul, S., **van Steenkiste**, S., Sajjadi, M. S., Goyal, A., Pathak, D., Fragkiadaki, K., Aggarwal†, G. & Kipf†, T. “Test-time adaptation with slot-centric models”. *Sixth Workshop on Meta-Learning at the Conference on Neural Information Processing Systems & NeurIPS Workshop on Distribution Shifts: Connecting Methods and Applications* (2022).
- [10] Gopalakrishnan, A., Irie, K., Schmidhuber, J. & **van Steenkiste**, S. “Unsupervised Learning of Temporal Abstractions with Slot-based Transformers”. *NeurIPS workshop on Offline Reinforcement Learning & NeurIPS Workshop on Deep Reinforcement Learning* (2021).
- [9] Ramesh, A., Kirsch, L., **van Steenkiste**, S. & Schmidhuber, J. “Exploring through Random Curiosity with General Value Functions”. *NeurIPS Workshop on Deep Reinforcement Learning & 5th Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM2022)* (2021).

- [8] Csordás, R., **van Steenkiste**, S. & Schmidhuber, J. “Are Neural Nets Modular? Inspecting Their Functionality Through Differentiable Weight Masks”. *ICML Workshop on Human Interpretability in Machine Learning (WHI)* (2020). **Spotlight Presentation.**
- [7] Gopalakrishnan, A., **van Steenkiste**, S. & Schmidhuber, J. “Unsupervised Object Keypoint Learning using Local Spatial Predictability”. *ICML Workshop on Object-Oriented Learning: Perception, Representation, and Reasoning* (2020). **Spotlight Presentation.**
- [6] Stanić, A., **van Steenkiste**, S. & Schmidhuber, J. “Hierarchical relational inference”. *ICML Workshop on Object-Oriented Learning: Perception, Representation, and Reasoning & ICML Workshop on Bridge Between Perception and Reasoning: Graph Neural Networks & Beyond* (2020).
- [5] **van Steenkiste\***, S., Greff\*, K. & Schmidhuber, J. “A perspective on objects and systematic generalization in model-based RL”. *ICML Workshop on Generative Modeling and Model-Based Reasoning for Robotics and AI*. (2019). **Oral Presentation.**
- [4] Unterthiner\*, T., **van Steenkiste\***, S., Kurach, K., Marinier, R., Michalski, M. & Gelly, S. “FVD: A new metric for video generation”. *ICLR Workshop on Deep Generative Models for Highly Structured Data* (2019).
- [3] **van Steenkiste**, S., Kurach, K. & Gelly, S. “A case for object compositionality in deep generative models of images”. *NeurIPS workshop on Modeling the Physical World: Learning, Perception, and Control & NeurIPS workshop on Relational Representation Learning* (2018).
- [2] **van Steenkiste**, S., Chang, M., Greff, K. & Schmidhuber, J. “Relational Neural Expectation Maximization”. *NIPS workshop on Cognitively Informed Artificial Intelligence* (2017). **Oral Presentation.**
- [1] Greff\*, K., **van Steenkiste\***, S. & Schmidhuber, J. “Neural Expectation Maximization”. *ICLR Workshop* (2017).

## TECHNICAL REPORTS

\* = equal (technical) contribution, † = equal advising

- [3] Qiu, L., Sha, F., Allen, K., Kim, Y., Linzen, T. & **van Steenkiste**, S. “Bayesian Teaching Enables Probabilistic Reasoning in Large Language Models”. *arXiv preprint arXiv:2503.17523* (2025).
- [2] Greff, K., **van Steenkiste**, S. & Schmidhuber, J. “On the binding problem in artificial neural networks”. *arXiv preprint arXiv:2012.05208* (2020).
- [1] Unterthiner\*, T., **van Steenkiste\***, S., Kurach, K., Marinier, R., Michalski, M. & Gelly, S. “Towards accurate generative models of video: A new metric & challenges”. *arXiv preprint arXiv:1812.01717* (2018).

## PRESENTATIONS

“DORSal: Diffusion for Object-Centric Representations of Scenes et al.” (2023), BayLearn - Machine Learning Symposium

“Representation Learning for Relational Reasoning” (2020), Stanford Neuroscience and Artificial Intelligence Laboratory (NeuroAILab)

- “Incorporating Objects in Neural Networks” (2019), Max Planck Institute for Intelligent Systems (Tübingen)
- “A Perspective on Objects and Systematic Generalization in Model-Based RL” (2019), ICML Workshop on Generative Modeling and Model-Based Reasoning for Robotics and AI
- “Relational Neural Expectation Maximization” (2017), NIPS Workshop on Cognitively Informed Artificial Intelligence
- “Symbol-like Representation Learning with Neural Expectation Maximization” (2017), Google Brain (Zürich office)