Andrea Dittadi

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Employment

Jul 2023–present **Postdoctoral Researcher**
Helmholtz AI & TU Munich, Munich, Germany

Nov–Dec 2023 and Apr 2024 **Visiting Researcher**
Mila, Montreal, Canada

Jul 2022–Jun 2023 **Postdoctoral Researcher**
KTH, Stockholm, Sweden

Jun–Sep 2021 **Research Intern**
Amazon, Tübingen, Germany
OOD generalization of large vision models in transfer learning (NeurIPS 2022).
Supervised by Francesco Locatello and Peter Gehler.

Sep–Nov 2020 **Research Intern**
Microsoft Research, Cambridge, UK
Generative models for human pose estimation from partial observations (ICCV 2021).
Supervised by Tom Cashman and Ben Lundell.

Feb–Aug 2020 **Research Intern**
Max Planck Institute for Intelligent Systems, Tübingen, Germany
Generalization of disentangled representations in robotics (ICLR 2021).
Supervised by Bernhard Schölkopf and Stefan Bauer.

2016–2019 **Research and Teaching Assistant**
Technical University of Denmark, Copenhagen, Denmark
Teaching in: Deep Learning, Artificial Intelligence and Multi-agent Systems, Computationally Hard Problems, Logical Theories for Uncertainty and Learning.

Education

2018–2022 **Technical University of Denmark**, Copenhagen, Denmark
PhD in Machine Learning
Probabilistic generative models, representation learning, variational inference.
Supervised by Ole Winther and Thomas Bolander.

2015–2017 **Technical University of Denmark**, Copenhagen, Denmark
MSc in Computer Science and Engineering, *12/12*
Machine learning, artificial intelligence, algorithms.
Thesis on combining neural networks and automated planning.

2014–2017 **University of Padua**, Italy
MSc in Telecommunication Engineering, *110/110 with honors*
Signal processing, stochastic processes, communication systems, computer vision.
Selected for T.I.M.E. double degree program at the Technical University of Denmark.

2011–2014 **University of Padua**, Italy
BSc in Information Engineering, *110/110 with honors*
Maths, physics, computer science, statistics, signal processing.

Publications

30. C. Kolloff,[*] T. Höppe,[*] E. Angelis,[*] M. Schreiner, S. Bauer, A. Dittadi,[†] S. Olsson.[†] *Minimum-Excess-Work Guidance*. arXiv:2505.13375, 2025.
29. A. Uselis, A. Dittadi, S. J. Oh. *Does Data Scaling Lead to Visual Compositional Generalization?*. **ICML** 2025.
28. A. M. K. Mamaghan, S. Papa, K. H. Johansson, S. Bauer, A. Dittadi. *Exploring the Effectiveness of Object-Centric Representations in Visual Question Answering: Comparative Insights with Foundation Models*. **ICLR** 2025.
27. A. Palma, T. Richter, H. Zhang, A. Dittadi, F. Theis. *Generating Multi-Modal and Multi-Attribute Single-Cell Counts with CFGen*. **ICLR** 2025.
26. S. Joshi, A. Dittadi, S. Lachapelle, D. Sridhar. *Identifiable Steering via Sparse Autoencoding of Multi-Concept Shifts*. arXiv:2502.12179, 2025.
25. Y. Esfandiari, S. Bauer, S. U. Stich, A. Dittadi. *Breaking the Likelihood–Quality Trade-off in Diffusion Models by Merging Pretrained Experts*. **ICLR Workshop** on Frontiers in Probabilistic Inference, 2025.
24. F. Kapl, A. M. K. Mamaghan, M. Horn, C. Marr, S. Bauer, A. Dittadi. *Object-Centric Representations Generalize Better Compositionally with Less Compute*. **ICLR Workshop** on World Models: Understanding, Modelling and Scaling, 2025.
23. B. M. G. Nielsen, L. Gresele,[†] A. Dittadi.[†] *Challenges in Explaining Representational Similarity through Identifiability*. **NeurIPS Workshop** on Unifying Representations in Neural Models (UniReps), 2024.
22. B. M. G. Nielsen, A. Christensen, A. Dittadi,[†] O. Winther.[†] *DiffEnc: Variational Diffusion with a Learned Encoder*. **ICLR** 2024.
21. A. M. K. Mamaghan, A. Dittadi, S. Bauer, F. Quinzan. *Diffusion-Based Causal Representation Learning*. **Entropy**, 2024.
20. C. Eastwood,[*] A. L. Nicolicioiu,[*] J. von Kügelgen,[*] A. Kekic, F. Träuble, A. Dittadi, B. Schölkopf. *DCI-ES: An Extended Disentanglement Framework with Connections to Identifiability*. **ICLR** 2023.
19. P. E. Christensen, V. Snæbjarnarson, A. Dittadi, S. Belongie, S. Benaim. *Assessing Neural Network Robustness via Adversarial Pivotal Tuning*. **WACV** 2023 (*oral, 2.6%*).
18. T. Höppe, A. Mehrjou,[†] S. Bauer,[†] D. Nielsen,[†] A. Dittadi.[†] *Diffusion Models for Video Prediction and Infilling*. **TMLR** (also **best paper award** at CVEU workshop @ ECCV), 2022.
17. F. Wenzel, A. Dittadi, P. Gehler, C. J. Simon-Gabriel, M. Horn, D. Zietlow, D. Kernert, C. Russell, T. Brox, B. Schiele, B. Schölkopf, F. Locatello. *Assaying Out-Of-Distribution Generalization in Transfer Learning*. **NeurIPS** 2022.
16. A. Dittadi, S. Papa, M. De Vita, B. Schölkopf, O. Winther, F. Locatello. *Generalization and Robustness Implications in Object-Centric Learning*. **ICML** 2022.
15. S. Papa, O. Winther, A. Dittadi. *Inductive Biases for Object-Centric Representations in the Presence of Complex Textures*. **ICML Workshop** on Dynamic Neural Networks (also at UAI Workshop on Causal Representation Learning), 2022.

14. A. Dittadi,* F. Träuble,* M. Wüthrich, F. Widmaier, P. Gehler, O. Winther, F. Locatello, O. Bachem, B. Schölkopf, S. Bauer. *The Role of Pretrained Representations for the OOD Generalization of Reinforcement Learning Agents*. **ICLR** 2022.

13. S. Bing, A. Dittadi, S. Bauer,† P. Schwab.† *Conditional Generation of Medical Time Series for Extrapolation to Underrepresented Populations*. **PLOS Digital Health**, 2022.

12. D. Chira,* I. Haralampiev,* O. Winther, A. Dittadi,† V. Liévin.† *Image Super-Resolution With Deep Variational Autoencoders*. **ECCV Workshop** on Advances in Image Manipulation, 2022.

11. Y. Chen, A. Dittadi, F. Träuble, S. Bauer, B. Schölkopf. *Boxhead: A Dataset for Learning Hierarchical Representations*. **NeurIPS Workshop** on Shared Visual Representations in Human & Machine Intelligence, 2021.

10. A. Dittadi, S. Dziadzio, D. Cosker, B. Lundell, T. Cashman, J. Shotton. *Full-Body Motion from a Single Head-Mounted Device: Generating SMPL Poses from Partial Observations*. **ICCV** 2021.

9. F. Träuble, E. Creager, N. Kilbertus, F. Locatello, A. Dittadi, A. Goyal, B. Schölkopf, S. Bauer. *On Disentangled Representations Learned From Correlated Data*. **ICML** 2021 (*long oral, 3%*).

8. A. Dittadi,* F. Träuble,* F. Locatello, M. Wüthrich, V. Agrawal, O. Winther, S. Bauer, B. Schölkopf. *On the Transfer of Disentangled Representations in Realistic Settings*. **ICLR** 2021.

7. A. Dittadi,* F. K. Drachmann,* T. Bolander. *Planning From Pixels in Atari With Learned Symbolic Representations*. **AAAI** 2021.

6. V. Liévin, A. Dittadi, A. Christensen, O. Winther. *Optimal Variance Control of the Score Function Gradient Estimator for Importance Weighted Bounds*. **NeurIPS** 2020.

5. A. Dittadi, O. Winther. *LAVAE: Disentangling Location and Appearance*. **NeurIPS Workshop** on Perception as Generative Reasoning, 2019.

4. V. Liévin, A. Dittadi, L. Maaløe, O. Winther. *Towards Hierarchical Discrete Variational Autoencoders*. Symposium on Advances in Approximate Bayesian Inference (**AABI**), 2019.

3. S. Pálsson,* S. Cerri,* A. Dittadi,* K. Van Leemput. *Semi-Supervised Variational Autoencoder for Survival Prediction*. **MICCAI Workshop** on Brain Lesion, 2019.

2. A. Dittadi, T. Bolander, O. Winther. *Learning to Plan from Raw Data in Grid-based Games*. Global Conference on Artificial Intelligence (**GCAI**), 2018.

1. A. Biason, A. Dittadi, M. Zorzi. *Spreading and repetitions in satellite MAC protocols*. IEEE International Conference on Communications (**ICC**), 2016.

*Shared first authors. †Shared last authors.

Summer Schools

Jul 2018 **FoPSS Logic and Learning School**
University of Oxford, UK

Aug 2016 **Advanced Topics in Machine Learning**
Technical University of Denmark, Copenhagen, Denmark

Jul 2016 **Regularization Methods for Machine Learning (RegML)**
University of Genoa, Italy

Academic Community

Reviewer for ICLR, ICML, NeurIPS, AAAI, SIGGRAPH, AAMAS, EUMAS, GCAI
Co-organizer of the 2nd Workshop on Current Trends in AI (Copenhagen, Denmark, 2017)

Awards and Scholarships

2020	ELLIS PhD Student (nominated by Ole Winther and Bernhard Schölkopf)
2019	Otto Mønsted Foundation travel grant for NeurIPS (7500 DKK)
2018	PhD scholarship, Technical University of Denmark
2015	TIME double degree scholarship
2015	Erasmus+ scholarship

Skills

Technical:	Python, PyTorch, Tensorflow; past: Java, MATLAB, basic C/C++ and Prolog
Tools:	LaTeX, Git
Languages:	Italian, English