

Thomas Möllenhoff

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RESEARCH INTERESTS

- Variational methods, optimization problems on measures, optimal transport.
- Probabilistic generative models, Bayesian deep learning, variational inference.
- Algorithms for continuous optimization (convex and nonconvex).
- Applications in machine learning, computer vision and image processing.

EDUCATION

Technical University of Munich

Ph.D. in Computer Science

February 2014 – present

Supervisor: Prof. Dr. Daniel Cremers

M.Sc. in Computer Science

October 2010 – January 2014

Supervisor: Prof. Dr. Daniel Cremers

B.Sc. in Computer Science (Minor: Mathematics)

August 2007 – September 2010

Technical University of Denmark

Exchange Student at DTU Compute

August 2012 – January 2013

LIST OF PUBLICATIONS

1. Z. Ye, T. Möllenhoff, T. Wu, and D. Cremers. Optimization of graph total variation via active-set-based combinatorial reconditioning. In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020.
2. P. Bréchet, T. Wu, T. Möllenhoff, and D. Cremers. Informative GANs via structured regularization of optimal transport. *Optimal Transport and Machine Learning (NeurIPS Workshops)*, 2019.
3. M. Moeller, T. Möllenhoff, and D. Cremers. Controlling neural networks via energy dissipation. In *International Conference on Computer Vision (ICCV)*, 2019.
4. T. Möllenhoff and D. Cremers. Flat metric minimization with applications in generative modeling. In *International Conference on Machine Learning (ICML)*, 2019. **Full Oral Presentation.**
5. T. Möllenhoff and D. Cremers. Lifting vectorial variational problems: A natural formulation based on geometric measure theory and discrete exterior calculus. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019. **Oral Presentation.**
6. B. Haefner, T. Möllenhoff, Y. Queau, and D. Cremers. Fight ill-posedness with ill-posedness: Single-shot variational depth super-resolution from shading. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2018. **Spotlight Presentation.**
7. T. Frerix, T. Möllenhoff, M. Moeller, and D. Cremers. Proximal backpropagation. In *International Conference on Learning Representations (ICLR)*, 2018.
8. T. Möllenhoff, Z. Ye, T. Wu, and D. Cremers. Combinatorial preconditioners for proximal algorithms on graphs. In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018.

9. T. Möllenhoff and D. Cremers. Sublabel-accurate discretization of nonconvex free-discontinuity problems. In *International Conference on Computer Vision (ICCV)*, 2017.
10. E. Laude, T. Möllenhoff, M. Moeller, J. Lellmann, and D. Cremers. Sublabel-accurate convex relaxation of vectorial multilabel energies. In *European Conference on Computer Vision (ECCV)*, 2016.
11. T. Möllenhoff, E. Laude, M. Moeller, J. Lellmann, and D. Cremers. Sublabel-accurate relaxation of nonconvex energies. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2016. **Best Paper Honorable Mention.**
12. T. Möllenhoff, E. Strelakovsky, M. Moeller, and D. Cremers. The primal-dual hybrid gradient method for semiconvex splittings. *SIAM Journal on Imaging Sciences*, 8(2):827–857, 2015.
13. T. Möllenhoff, E. Strelakovsky, M. Moeller, and D. Cremers. Low rank priors for color image regularization. In *Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR)*, 2015.
14. T. Möllenhoff, C. Nieuwenhuis, E. Toeppe, and D. Cremers. Efficient convex optimization for minimal partition problems with volume constraints. In *Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR)*, 2013.

TEACHING

Convex Optimization for Machine Learning and Computer Vision <i>Lecturer & Teaching Assistant</i>	Summer 2016, 2017
Practical Course: GPU Programming in Computer Vision <i>Lecturer & Teaching Assistant</i>	Summer 2014, 2015, 2017 Winter 2014, 2015
Computer Vision I: Variational Methods <i>Teaching Assistant</i>	Winter 2014, 2016
Combinatorial Optimization in Computer Vision <i>Teaching Assistant</i>	Winter 2015
Discrete Structures <i>Teaching Assistant</i>	Winter 2013

REVIEWING

Conferences

NeurIPS ('18, '19), ICLR ('19, '20), ICML ('19, '20), CVPR ('19, '20), ICCV ('19), AAAI ('20), ECCV ('20)

Journals

IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
International Journal on Computer Vision (IJCV)
SIAM Journal on Imaging Sciences (SIIMS)
Journal on Mathematical Imaging and Vision (JMIV)

AWARDS

CVPR Best Paper Honorable Mention	2016
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PATENTS

B. Haefner, Y. Queau, T. Möllenhoff, D. Cremers. Depth super-resolution from shading. *US Patent No. 16,400,584*. November 2019.