

Journal Articles

- [1] J. Cassel, B. Boll, S. Petra, P. Albers, and C. Schnörr. Sigma Flows for Image and Data Labeling and Learning Structured Prediction. *preprint arXiv:2408.15946*, 2024.
- [2] E. F. Sanmartín, C. Schnörr, and F.A. Hamprecht. The Central Spanning Tree Problem. *preprint arXiv:2404.06447*, 2024.
- [3] F. Savarino, P. Albers, and C. Schnörr. On the Geometric Mechanics of Assignment Flows for Metric Data Labeling. *Information Geometry*, 7:1–31, 2024.
- [4] B. Boll, D. Gonzalez-Alvarado, and C. Schnörr. Generative Modeling of Discrete Joint Distributions by E-Geodesic Flow Matching on Assignment Manifolds. *preprint arXiv:2402.07846*, 2024.
- [5] M. Hans, E. Kath, M. Sparn, N. Liebster, H. Strobel, M. K. Oberthaler, F. Draxler, and C. Schnörr. Bose Einstein Condensate as Nonlinear Block of a Machine Learning Pipeline. *Physical Review Research*, 6(013122), 2024.
- [6] B. Boll, J. Cassel, P. Albers, S. Petra, and C. Schnörr. A Geometric Embedding Approach to Multiple Games and Multiple Populations. *preprint arXiv:2401.05918*, 2024.
- [7] J. Schwarz, J. Cassel, B. Boll, M. Gärttner, P. Albers, and C. Schnörr. Quantum State Assignment Flows. *Entropy*, 25(9):1253, 2023.
- [8] B. Boll, A. Zeilmann, S. Petra, and C. Schnörr. Self-Certifying Classification by Linearized Deep Assignment. *PAMM: Proc. Appl. Math. Mech.*, 23(1):e202200169, 2023.
- [9] D. Sitenko, B. Boll, and C. Schnörr. A Nonlocal Graph-PDE and Higher-Order Geometric Integration for Image Labeling. *SIAM J. Imaging Sciences*, 16(1):501–567, 2023.
- [10] D. Schnörr and C. Schnörr. Learning System Parameters from Turing Patterns. *Machine Learning*, 112:3151–3190, 2023.
- [11] A. Zeilmann, S. Petra, and C. Schnörr. Learning Linearized Assignment Flows for Image Labeling. *J. Math. Imag. Vision*, 65:164–184, 2023.
- [12] F. Savarino, P. Albers, and C. Schnörr. On the Geometric Mechanics of Assignment Flows for Metric Data Labeling. *Information Geometry*, to appear (*arXiv:2111.02543*), 2021.
- [13] A. Zern, A. Zeilmann, and C. Schnörr. Assignment Flows for Data Labeling on Graphs: Convergence and Stability. *Information Geometry*, 5:355–404, 2022.

- [14] D. Sitenko, B. Boll, and C. Schnörr. Assignment Flow For Order-Constrained OCT Segmentation. *Int. J. Computer Vision*, 129:3088–3118, 2021.
- [15] F. Savarino and C. Schnörr. Continuous-Domain Assignment Flows (Special issue: Connections between Deep Learning and Partial Differential Equations). *Europ. J. Appl. Math.*, 32(3):570–597, 2021.
- [16] R. Hühnerbein, F. Savarino, S. Petra, and C. Schnörr. Learning Adaptive Regularization for Image Labeling Using Geometric Assignment. *J. Math. Imaging Vision*, 63:186–215, 2021.
- [17] M. Zisler, A. Zern, S. Petra, and C. Schnörr. Self-Assignment Flows for Unsupervised Data Labeling on Graphs. *SIAM Journal on Imaging Sciences*, 13(3):1113–1156, 2020.
- [18] A. Zern, M. Zisler, S. Petra, and C. Schnörr. Unsupervised Assignment Flow: Label Learning on Feature Manifolds by Spatially Regularized Geometric Assignment. *Journal of Mathematical Imaging and Vision*, 62(6–7):982–1006, 2020.
- [19] Y. Censor, S. Petra, and C. Schnörr. Superiorization vs. Accelerated Convex Optimization: The Superiorized/Regularized Least Squares Case. *J. Appl. Numer. Optimization*, 2(1):15–62, 2020.
- [20] A. Zeilmann, F. Savarino, S. Petra, and C. Schnörr. Geometric Numerical Integration of the Assignment Flow. *Inverse Problems*, 36(3):034004 (33pp), 2020.
- [21] M. Desana and C. Schnörr. Sum-Product Graphical Models. *Machine Learning*, 109(1):135–173, 2020.
- [22] L. Kostykin, C. Schnörr, and K. Rohr. Globally Optimal Segmentation of Cell Nuclei in Fluorescence Microscopy Images using Shape and Intensity Information. *Medical Image Analysis*, 58(101536), 2019.
- [23] F. Rathke and C. Schnörr. Fast Multivariate Log-Concave Density Estimation. *Comp. Statistics & Data Analysis*, 140:41–58, 2019.
- [24] R. Hühnerbein, F. Savarino, F. Åström, and C. Schnörr. Image Labeling Based on Graphical Models Using Wasserstein Messages and Geometric Assignment. *SIAM J. Imaging Science*, 11(2):1317–1362, 2018.
- [25] F. Åström and C. Schnörr. A Geometric Approach for Color Image Regularization. *Computer Vision and Image Understanding*, 165:43–59, 2017.
- [26] F. Silvestri, G. Reinelt, and C. Schnörr. Symmetry-free SDP Relaxations for Affine Subspace Clustering. 2016. preprint: <http://arxiv.org/abs/1607.07387>.
- [27] F. Åström, S. Petra, B. Schmitzer, and C. Schnörr. Image Labeling by Assignment. *J. Math. Imag. Vision*, 58(2):211–238, 2017.

- [28] J. Berger, F. Lenzen, F. Becker, A. Neufeld, and C. Schnörr. Second-Order Recursive Filtering on the Rigid-Motion Lie Group $SE(3)$ Based on Nonlinear Observations. *J. Math. Imag. Vision*, 58(1):102–129, 2017.
- [29] Y. Censor, A. Gibali, F. Lenzen, and C. Schnörr. The Implicit Convex Feasibility Problem and Its Application to Adaptive Image Denoising. *J. Comp. Math.*, 34(6):608–623, 2016.
- [30] M. Zisler, J.H. Kappes, Cl. Schnörr, S. Petra, and Ch. Schnörr. Non-Binary Discrete Tomography by Continuous Non-Convex Optimization. *IEEE Comp. Imaging*, 2(3):335 – 347, 2016.
- [31] J.H. Kappes, P. Swoboda, B. Savchynskyy, T. Hazan, and C. Schnörr. Multicuts and Perturb & MAP for Probabilistic Graph Clustering. *J. Math. Imag. Vision*, 56(2):221–237, 2016.
- [32] P. Swoboda, A. Shekhovtsov, J.H. Kappes, C. Schnörr, and B. Savchynskyy. Partial Optimality by Pruning for MAP-Inference with General Graphical Models. *IEEE Trans. Patt. Anal. Mach. Intell.*, 38(7):1370–1382, 2016.
- [33] J. Kappes, M. Speth, G. Reinelt, and C. Schnörr. Higher-order Segmentation via Multicuts. *Comp. Vision Image Understanding*, 143:104–119, 2016.
- [34] E.-M. Didden, T.L. Thorarinsdottir, A. Lenkoski, and C. Schnörr. Shape from Texture using Locally Scaled Point Processes. *Image Anal. Stereol.*, 34(3):161–170, 2015.
- [35] J.H. Kappes, B. Andres, F.A. Hamprecht, C. Schnörr, S. Nowozin, D. Batra, S. Kim, B.X. Kausler, T. Kröger, J. Lellmann, N. Komodakis, B. Savchynskyy, and C. Rother. A Comparative Study of Modern Inference Techniques for Structured Discrete Energy Minimization Problems. *Int. J. Comp. Vision*, 115(2):155–184, 2015.
- [36] N. Gianniotis, C. Schnörr, C. Molkenhain, and S.S. Bora. Approximate variational inference based on a finite sample of Gaussian latent variables. *Patt. Anal. Appl.*, 19(2):475–485, 2016.
- [37] B. Schmitzer and C. Schnörr. Globally Optimal Joint Image Segmentation and Shape Matching based on Wasserstein Modes. *J. Math. Imag. Vision*, 52(3):436–458, 2015.
- [38] F. Lenzen, J. Lellmann, F. Becker, and C. Schnörr. Solving Quasi-Variational Inequalities for Image Restoration with Adaptive Constraint Sets. *SIAM J. Imag. Sci.*, 7(4):2139–2174, 2014.
- [39] A. Denitui, S. Petra, Cl. Schnörr, and Ch. Schnörr. Phase Transitions and Cospase Tomographic Recovery of Compound Solid Bodies from Few Projections. *Fundamenta Informaticae*, 135:73–102, 2014.

- [40] F. Rathke, S. Schmidt, and C. Schnörr. Probabilistic Intra-Retinal Layer Segmentation in 3-D OCT Images Using Global Shape Regularization. *Medical Image Analysis*, 18(5):781–794, 2014.
- [41] P. Swoboda and C. Schnörr. Convex Variational Image Restoration with Histogram Priors. *SIAM J. Imag. Sci.*, 6(3):1719–1735, 2013.
- [42] S. Petra and C. Schnörr. Average Case Recovery Analysis of Tomographic Compressive Sensing. *Linear Algebra and its Applications*, 441:168–198, 2014. Special issue on Sparse Approximate Solution of Linear Systems.
- [43] F. Becker, F. Lenzen, J. Kappes, and C. Schnörr. Variational Recursive Joint Estimation of Dense Scene Structure and Camera Motion from Monocular High Speed Traffic Sequences. *Int. J. Comp. Vision*, 105(3):269–297, 2013.
- [44] J. Lellmann, B. Lellmann, F. Widmann, and C. Schnörr. Discrete and Continuous Models for Partitioning Problems. *Int. J. Comp. Vision*, 104(3):241–269, 2013.
- [45] S. Petra, C. Schnörr, and A. Schröder. Critical Parameter Values and Reconstruction Properties of Discrete Tomography: Application to Experimental Fluid Dynamics. *Fundamenta Informaticae*, 125:285–312, 2013.
- [46] J. Lellmann, F. Lenzen, and C. Schnörr. Optimality Bounds for a Variational Relaxation of the Image Partitioning Problem. *J. Math. Imag. Vision*, 47(3):239–257, 2013.
- [47] B. Schmitzer and C. Schnörr. Modelling Convex Shape Priors and Matching based on the Gromov-Wasserstein Distance. *J. Math. Imag. Vision*, 46(1):143–159, 2013.
- [48] D. Breitenreicher, J. Lellmann, and C. Schnörr. COAL: A Generic Modelling and Prototyping Framework for Convex Optimization Problems of Variational Image Analysis. *Optimiz. Methods Software*, 28(5):1081–1094, 2013.
- [49] F. Lenzen, F. Becker, J. Lellmann, S. Petra, and C. Schnörr. A Class of Quasi-Variational Inequalities for Adaptive Image Denoising and Decomposition. *Comp. Optimiz. Appl.*, 54(2):371–398, 2013.
- [50] A. Nicola, S. Petra, C. Popa, and C. Schnörr. A general extending and constraining procedure for linear iterative methods. *Int. J. Comp. Math.*, 89(2):231–253, 2012.
- [51] F. Becker, B. Wieneke, S. Petra, A. Schröder, and C. Schnörr. Variational Adaptive Correlation Method for Particle Image Velocimetry. *IEEE Trans. Image Proc.*, 21(6):3053–3065, 2012.
- [52] J. Lellmann and C. Schnörr. Continuous Multiclass Labeling Approaches and Algorithms. *SIAM J. Imaging Science*, 4(4):1049–1096, 2011.
- [53] D. Breitenreicher, J. Lellmann, and C. Schnörr. Sparse Template-Based Variational Image Segmentation. *Adv. Adaptive Data Analysis*, 3:149–166, 2011.

- [54] J. Lellmann and C. Schnörr. Regularizers for Vector-Valued Data and Labeling Problems in Image Processing. *Control Systems and Computers*, 2:43–54, 2011.
- [55] D. Breitenreicher and C. Schnörr. Model-Based Multiple Rigid Object Detection and Registration in Unstructured Range Data. *Int. J. Comp. Vision*, 92(1):32–52, 2011.
- [56] M. Bergtholdt, J. Kappes, S. Schmidt, and C. Schnörr. A Study of Parts-Based Object Class Detection Using Complete Graphs. *Int. J. Comp. Vision*, 87(1-2):93–117, 2010.
- [57] D. Breitenreicher and C. Schnörr. Robust 3D object registration without explicit correspondence using geometric integration. *Mach. Vision Appl.*, 21(5):601–611, 2010.
- [58] D. Heitz, E. Mémin, and C. Schnörr. Variational Fluid Flow Measurements from Image Sequences: Synopsis and Perspectives. *Exp. Fluids*, 48(3):369–393, 2010.
- [59] A. Vlasenko and C. Schnörr. Physically Consistent and Efficient Variational Denoising of Image Fluid Flow Estimates. *IEEE Trans. Image Proc.*, 19(3):586–595, 2010.
- [60] J. Yuan, C. Schnörr, and G. Steidl. Convex Hodge Decomposition and Regularization of Image Flows. *J. Math. Imag. Vision*, 33(2):169–177, 2009.
- [61] S. Petra and C. Schnörr. TomoPIV meets Compressed Sensing. *Pure Math. Appl.*, 20(1-2):49 – 76, 2009.
- [62] S. Munder, C. Schnörr, and D. Gavrilu. Pedestrian Detection and Tracking Using a Mixture of View-Based Shape-Texture Models. *IEEE Trans. Intell. Transp. Systems*, 9(2):333–343, 2008.
- [63] J. Gall, J. Potthoff, C. Schnörr, B. Rosenhahn, and H.-P. Seidel. Interacting and Annealing Particle Filters: Mathematics and a Recipe for Applications. *J. Math. Imag. Vision*, 28:1–18, 2007.
- [64] P. Ruhnau and C. Schnörr. Optical Stokes Flow Estimation: An Imaging-Based Control Approach. *Exp. Fluids*, 42:61–78, 2007.
- [65] P. Ruhnau, A. Stahl, and C. Schnörr. Variational Estimation of Experimental Fluid Flows with Physics-Based Spatio-Temporal Regularization. *Meas. Science Techn.*, 18:755–763, 2007.
- [66] C. Schellewald, S. Roth, and C. Schnörr. Evaluation of a convex relaxation to a quadratic assignment matching approach for relational object views. *Image Vision Comp.*, 25:1301–1314, 2007.
- [67] C. Schnörr. Signal and Image Approximation with Level-Set Constraints. *Computing*, 81:137–160, 2007.

- [68] M. Welk, J. Weickert, F. Becker, C. Schnörr, C. Feddern, and B. Burgeth. Median and related local filters for tensor-valued images. *Signal Processing*, 87:291–308, 2007.
- [69] J. Yuan, C. Schnörr, and E. Mémin. Discrete Orthogonal Decomposition and Variational Fluid Flow Estimation. *J. Math. Imag. Vision*, 28(1):67–80, 2007.
- [70] J. Yuan, C. Schnörr, and G. Steidl. Simultaneous Optical Flow Estimation and Decomposition. *SIAM J. Scientific Computing*, 29(6):2283–2304, 2007.
- [71] A. Bruhn, J. Weickert, T. Kohlberger, and C. Schnörr. A Multigrid Platform for Real-Time Motion Computation with Discontinuity-Preserving Variational Methods. *Int. J. Computer Vision*, 70(3):257–277, 2006.
- [72] D. Cremers, N. Sochen, and C. Schnörr. Multiphase Dynamic Labeling for Variational Recognition-Driven Image Segmentation. *Int. J. Comp. Vision*, 66(1):67–81, 2006.
- [73] M. Heiler and C. Schnörr. Learning Sparse Representations by Non-Negative Matrix Factorization and Sequential Cone Programming. *J. Mach. Learning Res.*, 7:1385–1407, July 2006.
- [74] A. Bruhn, J. Weickert, C. Feddern, T. Kohlberger, and C. Schnörr. Variational optic flow computation in real-time. *IEEE Trans. Image Proc.*, 14(5):608–615, 2005.
- [75] A. Bruhn, J. Weickert, and C. Schnörr. Lucas/Kanade Meets Horn/Schunck: Combining Local and Global Optic Flow Methods. *Int. J. Comp. Vision*, 61(3):211–231, 2005.
- [76] M. Heiler and C. Schnörr. Natural Image Statistics for Natural Image Segmentation. *Int. J. Comp. Vision*, 63(1):5–19, 2005.
- [77] T. Kohlberger, C. Schnörr, A. Bruhn, and J. Weickert. Domain decomposition for variational optical flow computation. *IEEE Trans. Image Proc.*, 14(8):1125–1137, 2005.
- [78] J. Neumann, C. Schnörr, and G. Steidl. Combined SVM-based Feature Selection and Classification. *Machine Learning*, 61:129–150, 2005.
- [79] J. Neumann, C. Schnörr, and G. Steidl. Efficient Wavelet Adaption for Hybrid Wavelet-Large Margin Classifiers. *Pattern Recognition*, 38(11):1815–1830, 2005.
- [80] P. Ruhnau, C. Gütter, T. Putze, and C. Schnörr. A Variational Approach for Particle Tracking Velocimetry. *Meas. Science Techn.*, 16:1449–1458, 2005.
- [81] P. Ruhnau, T. Kohlberger, H. Nobach, and C. Schnörr. Variational Optical Flow Estimation for Particle Image Velocimetry. *Exp. Fluids*, 38:21–32, 2005.

- [82] T. Schüle, C. Schnörr, S. Weber, and J. Hornegger. Discrete Tomography By Convex-Concave Regularization and D.C. Programming. *Discr. Appl. Math.*, 151:229–243, Oct 2005.
- [83] T. Schüle, S. Weber, and C. Schnörr. Adaptive Reconstruction of Discrete-Valued Objects from few Projections. *Electr. Notes in Discr. Math.*, 20:365–384, 2005.
- [84] S. Weber, T. Schüle, and C. Schnörr. Prior Learning and Convex-Concave Regularization of Binary Tomography. *Electr. Notes in Discr. Math.*, 20:313–327, 2005.
- [85] A. Bruhn, T. Jakob, M. Fischer, J. Weickert, U. Brünig, and C. Schnörr. High performance cluster computing with 3-D nonlinear diffusion filters. *Real-Time Imaging*, 10(1):41–51, 2004.
- [86] S. Weber, T. Schüle, C. Schnörr, and J. Hornegger. A Linear Programming Approach to Limited Angle 3D Reconstruction from DSA Projections. *Methods of Information in Medicine*, 43(4):320–326, 2004.
- [87] D. Cremers, T. Kohlberger, and C. Schnörr. Shape Statistics in Kernel Space for Variational Image Segmentation. *Pattern Recognition*, 36(9):1929–1943, 2003.
- [88] D. Cremers and C. Schnörr. Statistical Shape Knowledge in Variational Motion Segmentation. *Image and Vision Comp.*, 21(1):77–86, 2003.
- [89] J. Keuchel, C. Schnörr, C. Schellewald, and D. Cremers. Binary Partitioning, Perceptual Grouping, and Restoration with Semidefinite Programming. *IEEE Trans. Patt. Anal. Mach. Intell.*, 25(11):1364–1379, 2003.
- [90] F. Cremers, D. and Tischhäuser, J. Weickert, and C. Schnörr. Diffusion Snakes: Introducing Statistical Shape Knowledge into the Mumford–Shah functional. *Int. J. Computer Vision*, 50(3):295–313, 2002.
- [91] W. Hinterberger, O. Scherzer, C. Schnörr, and J. Weickert. Analysis of Optical Flow Models in the Framework of Calculus of Variations. *Numer. Funct. Anal. Optimiz.*, 23(1/2):69–89, 2002.
- [92] J. Heers, C. Schnörr, and H.S. Stiehl. Globally–Convergent Iterative Numerical Schemes for Non–Linear Variational Image Smoothing and Segmentation on a Multi–Processor Machine. *IEEE Trans. Image Proc.*, 10(6):852–864, 2001.
- [93] J. Weickert, J. Heers, C. Schnörr, K.-J. Zuiderveld, O. Scherzer, and H.-S. Stiehl. Fast parallel algorithms for a broad class of nonlinear variational diffusion approaches. *Real–Time Imaging*, 7(1):31–45, 2001.
- [94] J. Weickert and C. Schnörr. Variational Optic Flow Computation with a Spatio-Temporal Smoothness Constraint. *J. Math. Imaging and Vision*, 14(3):245–255, 2001.

- [95] J. Weickert and C. Schnörr. A Theoretical Framework for Convex Regularizers in PDE-Based Computation of Image Motion. *Int. J. Computer Vision*, 45(3):245–264, 2001.
- [96] K. Wiehler, J. Heers, C. Schnörr, H.-S. Stiehl, and R.-R. Grigat. A 1D analog VLSI implementation for non-linear real-time signal preprocessing. *Real-Time Imaging*, 7(1):127–142, 2001.
- [97] J. Weickert and C. Schnörr. PDE-Based Preprocessing of Medical Images. *Künstliche Intelligenz*, (3):5–10, July 2000.
- [98] W. Peckar, C. Schnörr, K. Rohr, and H.-S. Stiehl. Parameter-Free Elastic Deformation Approach for 2D and 3D Registration Using Prescribed Displacements. *J. Math. Imaging and Vision*, 10(2):143–162, 1999.
- [99] W. Peckar, C. Schnörr, K. Rohr, H.-S. Stiehl, and U. Spetzger. Linear and Incremental Estimation of Elastic Deformations in Medical Registration Using Prescribed Displacements. *Machine Graphics & Vision*, 7(4):807–829, 1998.
- [100] C. Schnörr. A Study of a Convex Variational Diffusion Approach for Image Segmentation and Feature Extraction. *J. of Math. Imag. and Vision*, 8(3):271–292, 1998.
- [101] C. Schnörr, R. Sprengel, and B. Neumann. A Variational Approach to the Design of Early Vision Algorithms. *Computing Suppl.*, 11:149–165, 1996.
- [102] C. Schnörr. Unique Reconstruction of Piecewise Smooth Images by Minimizing Strictly Convex Non-Quadratic Functionals. *J. Math. Imag. Vision*, 4:189–198, 1994.
- [103] C. Schnörr and R. Sprengel. A Nonlinear Regularization Approach to Early Vision. *Biol. Cybernetics*, 72:141–149, 1994.
- [104] K. Rohr and C. Schnörr. An Efficient Approach to the Identification of Characteristic Intensity Variations. *Image and Vis. Comp.*, 11(5):273–277, 1993.
- [105] C. Schnörr. On Functionals with Greyvalue-Controlled Smoothness Terms for Determining Optical Flow. *IEEE Trans. Patt. Anal. Mach. Intell.*, 15(10):1074–1079, 1993.
- [106] C. Schnörr. Computation of Discontinuous Optical Flow by Domain Decomposition and Shape Optimization. *Int. J. Comp. Vision*, 8(2):153–165, 1992.
- [107] C. Schnörr. Determining Optical Flow for Irregular Domains by Minimizing Quadratic Functionals of a Certain Class. *Int. J. Comp. Vision*, 6(1):25–38, 1991.