Johannes Maly

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Positions

11/2020–now **PostDoc (akademischer Rat auf Zeit)**, *Department of Scientific Computing, Catholic University of Eichstaett/Ingolstadt*, Eichstaett.

02/2019–10/2020 **PostDoc**, *Chair for Mathematics of Data Processing, RWTH Aachen University*, Aachen.

Education

01/2016–01/2019 **PhD in mathematics**, *Technical University of Munich*, Munich.
under supervision of Prof. Massimo Fornasier

10/2013–09/2015 **Master of Science**, *Technical University of Munich*, Munich, *1.2 - passed with high distinction*.
Mathematics

10/2011–09/2013 **Bachelor of Science**, *Technical University of Munich*, Munich, *1.9 - passed with merit*.
Mathematics with minor in computer science

05/2011–09/2011 **TwoInOne program**, *Technical University of Munich*, Munich.
Special program to shorten Bachelor's degree

09/2003–04/2011 **University-entrance diploma**, *Erasmus Grasser Gymnasium*, Munich, *1.2 - passed with high distinction*.

Theses

Ph.D. thesis *Recovery Algorithms for Quantized Compressed Sensing*;
Advisor Prof. Massimo Fornasier

M.Sc. thesis *Weighted Energy-Dissipation Approximation for an Optimal Control Problem*;
Advisor Prof. Martin Brokate

Experience

Teaching — Further Education

04/2018–02/2019 **"Zertifikat Hochschullehre der Bayrischen Universitäten"**, *TU Munich*.
Seminar on advanced methods for teaching

Teaching — Courses

11/2020–03/2021 **"Introduction to Numerical Analysis" (Lecture+Exercises)**, *Catholic University of Eichstaett/Ingolstadt*, Eichstaett.

04/2020–09/2020 **Teaching assistant for "Optimization"**, *RWTH University Aachen*, Aachen.

10/2019–03/2020 **Teaching assistant for "Repetitorium - Higher Mathematics II"**, *RWTH University Aachen*, Aachen.

04/2019–09/2019 **Teaching assistant for "Higher Mathematics II"**, *RWTH University Aachen*, Aachen.

04/2018-09/2018 **Teaching assistant for "Foundations of Data Analysis"**, *Technical University of Munich*, Munich.

04/2014-09/2014 **Teaching assistant for "Analysis für Informatiker"**, *Technical University of Munich*, Munich.

04/2012-09/2012 **Teaching assistant for "Analysis für Informatiker"**, *Technical University of Munich*, Munich.

Thesis Supervision

02/2020–05/2020 **Advisor for Bachelor's Thesis "On the relation between stability and regularisation for Support Vector Machines" of Havva Akcay**, *RWTH University Aachen*, Aachen.

04/2019–09/2019 **Advisor for Master's Thesis "Non-Convex Approaches to Compressed Sensing and Robust Recovery of Simultaneously Structured Signals from Inaccurate and Incomplete Information" of Konstantin Riedl**, *Technical University of Munich*, Munich.

02/2018–08/2018 **Advisor for Master's Thesis "Near-Optimal Data-Driven ℓ_1-Regularization" of Judith Wewerka**, *Technical University of Munich*, Munich.

Visiting Researcher

03/2019 **Research stay**, *Simula Research Laboratory*, Oslo.

03/2016–04/2016 **Research stay**, *Hausdorff Research Institute for Mathemtaics*, Bonn.

08/2014–01/2015 **Semester abroad**, *Nanyang Technological University*, Singapore.

Vocational

2012-2015 **Work experience and working student**, *Siemens*, Munich.
Work on pedestrian flow simulation based on cellular automatons and enhancements of simulator

List of Publications

Submitted Preprints to Refereed Journals

[8] **F. Boßmann, S. Krause-Solberg, J. Maly, N. Sissouno**, "Structural Sparsity in Multiple Measurements", 2021, *arXiv preprint: https://arxiv.org/abs/2103.01908*.

[7] **A. Caragea, D. G. Lee, J. Maly, G. Pfander, and F. Voigtlaender**, "Quantitative approximation results for complex-valued neural networks", 2021, *arXiv preprint: https://arxiv.org/abs/2102.13092*.

[6] **H.–H. Chou, C. Gieshoff, J. Maly, and H. Rauhut**, "Gradient Descent for Deep Matrix Factorization: Dynamics and Implicit Bias towards Low Rank", 2020, *arXiv preprint: https://arxiv.org/abs/2011.13772*.

[5] **H. C. Jung, J. Maly, L. Palzer, and A. Stollenwerk**, "Quantized Compressed Sensing by Rectified Linear Units", 2019, *arXiv preprint: https://arxiv.org/abs/1911.07816*.

Accepted and Published Articles

[4] **Z. Kereta, J. Maly, and V. Naumova**, "Computational approaches to non-convex, sparsity-inducing multi-penalty regularization", 2021, *to appear in Inverse Problems*.

[3] **M. Iwen, F. Krahmer, S. Krause-Solberg, and J. Maly**, "On Recovery Guarantees for One-Bit Compressed Sensing on Manifolds", 2021, *to appear in Discrete and Computational Geometry*.

[2] **M. Fornasier, J. Maly and V. Naumova**, "Robust Recovery of Low-Rank Matrices with Non-Orthogonal Sparse Decomposition from Incomplete Measurements", 2020, *Applied Mathematics and Computation*.

[1] **J. Maly and L. Palzer**, "Analysis of Hard-Thresholding for Distributed Compressed Sensing with One-Bit Measurements", 2018, *Information and Inference: A Journal of the IMA* .

Conference Papers

[8] **H. C. Jung, J. Maly, L. Palzer, and A. Stollenwerk**, "Quantized Compressed Sensing by Rectified Linear Units", 2021, *Proceedings in Applied Mathematics and Mechanics — PAMM 2021*.

[7] **A. Guth, C. Culotta-López, J. Maly, H. Rauhut, and D. Heberling**, "Polyhedral Sampling Structures for Phaseless Spherical Near-Field Antenna Measurements", 2020, *42nd Antenna Measurement Techniques Association Symposium (AMTA)* .

[6] **H. C. Jung, J. Maly, L. Palzer, and A. Stollenwerk**, "Quantized Compressed Sensing by Rectified Linear Units", 2020, *iTWIST'20 workshop*.

[5] **S. Dirksen, M. Iwen, S. Krause-Solberg, and J. Maly**, "Robust One-bit Compressed Sensing With Manifold Data", 2019, *International Conference on Sampling Theory and Applications (SampTA)*.

[4] **H. C. Jung, J. Maly, L. Palzer, and A. Stollenwerk**, "One-Bit Compressed Sensing by Convex Relaxation of the Hamming Distance", 2019, *SPARS workshop*.

[3] **Z. Kereta, J. Maly, and V. Naumova**, "Linear convergence and support recovery for non-convex multi-penalty regularisation", 2019, *SPARS workshop*.

[2] **M. Fornasier, J. Maly and V. Naumova**, "Robust Recovery of Low-Rank Matrices using Multi-Penalty Regularization", 2017, *NIPS workshop Optimization for Machine Learning, Long Beach*.

[1] **S. Krause-Solberg and J. Maly**, "A tractable approach for one-bit Compressed Sensing on manifolds", 2017, *International Conference on Sampling Theory and Applications (SampTA)*.

Scientific Presentations

Invited Presentations

July 2019 **Talk on "One-Bit Compressed Sensing with Manifold Data"**, *Applied Inverse Problems (AIP2019)*, Université Grenoble-Alpes, France.

March 2019 **Talk on "Distributed Compressed Sensing with One-Bit Measurements"**, *Simula Research Laboratory*, Oslo, Norway.

May 2018 **Talk on "Matrix Sensing Using Combined Sparsity and Low-Rank Constraints"**, *Inverse Problems: Modeling and Simulation (IPMS2018)*, Malta.

May 2017 **Talk on "Matrix Sensing Using Combined Sparsity and Low-Rank Constraints"**, *Applied Inverse Problems (AIP2017)*, Zhejiang University, China.

December 2016 **Talk on "Structured Compressed Sensing - Using Patterns in Sparsity"**, *CoSIP Winter Retreat*, TU Berlin, Germany.

Submitted Presentations

July 2019 **Poster on "Linear Convergence and Support Recovery for Non-Convex Multi-Penalty Regularisation"**, *Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, INP-ENSEEIHT, France.

July 2019 **Poster on "One-Bit Compressed Sensing by Convex Relaxation of the Hamming Distance"**, *Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, INP-ENSEEIHT, France.

June 2018 **Poster on "A Tractable Approach for One-Bit Compressed Sensing on Manifolds"**, *DS3 summer school*, École polytechnique, France.

March 2018 **Talk on "ATLAS: A Multi-Penalty Approach to Compressed Sensing of Low-Rank Matrices with Sparse Decomposition"**, *GAMM2018*, TU Munich, Germany.

May 2017 **Poster on "Robust Recovery of Low-Rank Matrices using Multi-Penalty Regularization"**, *Optimization for Machine Learning (OPT2017) as part of Neural Information Processing Systems (NeurIPS2017)*, Los Angeles, USA.

December 2017 **Poster on "Distributed Compressed Sensing with One-Bit Measurements"**, *3. International Matheon Conference on Compressed Sensing and its Applications*, TU Berlin, Germany.

May 2017 **Talk on "Matrix Recovery Using Combined Sparsity and Low-Rank Constraints"**, *Workshop on Approximation Theory and Applications (WOATA)*, Universität Wien, Austria.