

KARIN SCHNASS

CURRICULUM VITAE

PERSONAL DETAILS

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Email: karin.schnass@uibk.ac.at
Date of Birth: May 3, 1980
Nationality: Austrian
Track Record: h-index: **10**, citations: **895** (Google Scholar, September 17, 2015)
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EDUCATION

March 2009 PhD in computer, communication and information sciences, Swiss Federal Institute of Technology Lausanne (EPFL), CH, no grades are awarded, the thesis was proposed for the EPFL PhD-thesis prize by the jury.
Thesis: Sparsity& Dictionaries - Algorithms& Design,
Advisor: Pierre Vandergheynst.

April 2004 Master in mathematics with distinction (mit Auszeichnung), University of Vienna, AT.
Thesis: Gabor Multipliers - A Self-Contained Survey,
Supervisor: Hans G. Feichtinger.

CURRENT AND FORMER POSITIONS (INCLUDING CAREER BREAKS)

since 06/15 University assistant, Department of Mathematics, University of Innsbruck, AT.

12/14 - 05/15 Erwin Schrödinger Research Fellow (return phase), Department of Mathematics, University of Innsbruck, AT.

10/12 - 09/14 Erwin Schrödinger Research Fellow, Computer Vision Laboratory, University of Sassari, IT.

06/11 - 09/12 Maternity leave.

01/10 - 05/11 Postdoc (part-time), Johann Radon Institute for Computational and Applied Mathematics (RICAM), Linz, AT.

06/09 - 01/10 Maternity leave.

04/05 - 06/09 Research Assistant, Signal Processing Laboratory 2, Swiss Federal Institute of Technology Lausanne (EPFL), CH.

05/04 - 01/05 'Leonardo da Vinci' industrial internship at Philips Research, Eindhoven, NL.

10/03 - 01/04 Mathematics teaching assistant at the University of Vienna and the University of Natural Resources and Applied Life Sciences Vienna (BOKU), AT.

GRANTS

2014 START-programme, grant Y760, €1.165.000 for 6 years, FWF (Austrian Science Fund), project: 'Optimisation Principles, Models & Algorithms for Dictionary Learning'.

2012 Erwin Schrödinger Fellowship, grant J3335, €120.000 for 2.5yrs, FWF (Austrian Science Fund) Marie Curie cofunded, project: 'Dictionary Learning for Biometric Data'.

HONOURS

- 2015 Member of the Special Area Team 'Signal and Data Analytics for Machine Learning' of the European Association for Signal Processing, (SAT SiG-DML, EURASIP).
- 2015 Offer of (first-listed for) a Rudolf Mößbauer Tenure Track Professorship at the Technical University of Munich, DE, *declined*.
- 2014 Invited Affiliate Member of the Signal Processing Theory and Methods (SPTM) Technical Committee of the IEEE Signal Processing Society.
- 2014 Shortlisted for a tenure track W2-professor position in 'Optimization and Data Analysis' at the Technical University of Munich, DE.
- 2013 Best Video Abstract at SPARS13.
- 2011 Offer of a postdoctoral position at Duke University, US, with Ingrid Daubechies, *declined*.
- 2010 Offer of a postdoctoral position at Stanford University, US, with Yonina Eldar and Andrea Goldsmith, *declined*.
- 2009 Nomination of the doctoral thesis for the EPFL PhD-thesis prize by the jury.
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TEACHING

- WS15 Seminar 'Codes' at the University of Innsbruck, AT.
- SS15 Seminar 'Randomness, matrices and random matrices' at the University of Innsbruck, AT.
- SS13 'Informatica Grafica - Introduzione a Blender' at the University of Sassari, IT.
- WS06/07/08 Exercise Sessions 'Advanced Signal Processing' at EPFL, CH.
- WS03 Workshop 'Lineare Algebra und Geometrie' at the University of Vienna, AT.
- WS03 Exercise Sessions 'Mathematik für Landwirte' at BOKU Vienna, AT.
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REFEREE

IEEE Transactions on Information Theory;
 IEEE Transactions on Signal Processing;
 IEEE Transactions on Pattern Analysis and Machine Intelligence;
 Applied and Computational Harmonic Analysis;
 SIAM Journal on Imaging Sciences;
 Elsevier Signal Processing;
 Signal, Image and Video Processing;
 IEEE Signal Processing Letters;
 ICASSP; EUSIPCO; SampTA; SPARS; COLT;

LANGUAGES

German, English, Italian and bad French.

PERSONAL PUBLICATIONS

all publications are available at <http://homepage.uibk.ac.at/~c7021041/pub.htm>. For journal publications the bold faced number in brackets indicates the number of citations according to Google Scholar, e.g. [10].

Journal publications (including preprints)

9. *Convergence radius and sample complexity of ITKM algorithms for dictionary learning*, arXiv:1503.07027, 29 pages, 2015.
8. *Identification of overcomplete dictionaries*, Journal of Machine Learning Research, 16(Jun):1211–1242, 2015. [5]

7. *On the identifiability of overcomplete dictionaries via the minimisation principle underlying K-SVD*, Applied and Computational Harmonic Analysis, 37(3):464–491, 2014. [17]
6. *Learning functions of few arbitrary linear parameters in high dimensions* (with M. Fornasier and J. Vybiral), Foundations of Computational Mathematics, 12(2):229–262, 2012. [26]
5. *Dictionary identification - sparse matrix-factorisation via ℓ_1 -minimisation* (with R. Gribonval), IEEE Transactions on Information Theory, 56(7):3523–3539, 2010. [90]
4. *Atoms of all channels, unite! Average case analysis of multi-channel sparse recovery using greedy algorithms* (with R. Gribonval, H. Rauhut and P. Vandergheynst), Journal of Fourier Analysis and Applications, 14(5):655–687, 2008. [135]
3. *Compressed sensing and redundant dictionaries* (with H. Rauhut and P. Vandergheynst), IEEE Transactions on Information Theory, 54(5):2210–2219, 2008. [418]
2. *Dictionary preconditioning for greedy algorithms* (with P. Vandergheynst), IEEE Transactions on Signal Processing, 56(5):1994–2002, 2008. [93]
1. *Average performance analysis for thresholding* (with P. Vandergheynst), IEEE Signal Processing Letters, 14(11):828–831, 2007. [43]

Refereed conference proceedings

11. *Dictionary identification results for K-SVD with sparsity parameter 1*, SampTA13, Bremen, DE, 2013.
10. *Learning functions of few arbitrary linear parameters in high dimensions* (with M. Fornasier and J. Vybiral), SampTA11, Singapore, 2011.
9. *Compressed learning of high-dimensional sparse functions* (with J. Vybiral), ICASSP11, Prague, CZ, 2011.
8. *A union of incoherent spaces model for classification* (with P. Vandergheynst), ICASSP10, Dallas, US, 2010.
7. *Basis identification from random sparse samples* (with R. Gribonval), SPARS09, St. Malo, FR, 2009.
6. *Dictionary identifiability from few training samples* (with R. Gribonval), EUSIPCO08, Lausanne, CH, 2008.
5. *Some recovery conditions for basis learning by ℓ_1 -minimization* (with R. Gribonval), ISCCSP08, St. Julian's, Malta, 2008.
4. *Dictionary learning based dimensionality reduction for classification* (with P. Vandergheynst), ISCCSP08, St. Julian's, Malta, 2008.
3. *Multichannel thresholding with sensing dictionaries* (with R. Gribonval, B. Mailhe, H. Rauhut and P. Vandergheynst), CAMSAP07, St. Thomas, US Virgin Islands, 2007.
2. *Average case analysis of multichannel sparse approximations using p -thresholding* (with R. Gribonval, B. Mailhe, H. Rauhut and P. Vandergheynst), SPIE Optics and Photonics, Wavelets XII, San Diego, US, 2007.
1. *Average case analysis of multichannel thresholding* (with R. Gribonval, B. Mailhe, H. Rauhut and P. Vandergheynst), ICASSP07, Honolulu, US, 2007.

Theses

2. *Sparsity & Dictionaries - Algorithms & Design*, PhD-Thesis, n. 4349, Swiss Federal Institute of Technology Lausanne (EPFL), 2009.
1. *Gabor Multipliers - A Self-Contained Survey*, Master's Thesis, University of Vienna, Austria, 2004.

Other

1. *A Personal Introduction to Theoretical Dictionary Learning*, Internationale Mathematische Nachrichten, 228:5–15, 2015.

CONFERENCES, WORKSHOPS AND TALKS

Invited talks are marked with a *.

Workshops/conferences without a presentation are only listed if participation is by personal invitation.

- 26.* *Dagstuhl Seminar - Mathematical and Computational Foundations of Learning Theory*, August 16-22, 2015, Wadern, DE.
- 25.* *Oberwolfach Workshop - Applied Harmonic Analysis and Sparse Approximation*, August 30 - September 4, 2015, Oberwolfach, DE.
24. *SPARS15 - Signal Processing with Adaptive Sparse Structured Representations*, July 6-9, 2015, Cambridge, UK.
- 23.* *AIP15 - Applied Inverse Problems Conference*, May 25-29, 2015, Helsinki, FI.
- 22.* *Seminar*, Team Panama, INRIA Rennes, July 7, 2014, Rennes, FR.
- 21.* *Seminar*, Chair of Mathematics C, RWTH Aachen, May 5, 2014, Aachen, DE.
- 20.* *Telecommunications Forum*, Telecommunications Research Center Vienna (FTW)/ Vienna University of Technology, April 25, 2014, Vienna, AT.
19. *Matheon Workshop 2013 - Compressed Sensing and its Applications*, December 9-13, 2013, Berlin, DE, **Young Researcher Travel Grant**.
- 18.* *ENUMATH13 - European Conference on Numerical Mathematics and Advanced Applications*, August 26-30, 2013, Lausanne, CH.
- 17.* *Seminar*, Institute of Telecommunications, Vienna University of Technology, August 21, 2013, Vienna, AT.
16. *SPARS13 - Signal Processing with Adaptive Sparse Structured Representations*, July 8-11, 2013, Lausanne, CH, **Best Video Abstract**.
- 15.* *SampTA13 - International Conference on Sampling Theory and Applications*, July 1-5, 2013, Bremen, DE.
14. *Oberwolfach Workshop - Applied Harmonic Analysis and Sparse Approximation*, June 10-16, 2012, Oberwolfach, DE, **Young Researcher Travel Grant**.
13. *ICASSP11 - International Conference on Acoustics, Speech, and Signal Processing*, May 23-27, 2011, Prague, CZ.
- 12.* *SMALL Workshop on Dictionary Learning*, January 6-7, 2011, London, GB.
- 11.* *Oberseminar Numerische Mathematik*, University of Jena, November 17, 2010, Jena, DE.
- 10.* *Curves and Surfaces*, June 24-30, 2010, Avignon, FR.
- 9.* *Workshop - Sparsity and Computation*, Hausdorff Center for Mathematics, June 7-11, 2010, Bonn, DE.
- 8.* *NuHAG Seminar*, University of Vienna, May 5, 2010, Vienna, AT.
- 7.* *Seminar*, Acoustic Research Institute, May 4, 2010, Vienna, AT.
6. *SPARS09 - Signal Processing with Adaptive Sparse Structured Representations*, April 6-9, 2009, Saint-Malo, FR.
- 5.* *NuHAG Seminar*, University of Vienna, October 30, 2008, Vienna, AT.
4. *AIM Workshop - Frames for the Finite World: Sampling, Coding and Quantization*, August 18-22, 2008, Palo Alto (CA), US, **Travel Grant**.
3. *ISCCSP08*, March 12-14, 2008, St. Julian's, MT.
- 2.* *Von Neumann Symposium on Sparse Representation and High-Dimensional Geometry*, July 8-12, 2007, Snowbird (UT), US.
1. *Strobl07 - Trends in Harmonic Analysis*, June 18-22, 2007, Strobl, AT.