

Peter Jung

✉ peter.jung@tu-berlin.de
📄 www.user.tu-berlin.de/peter.jung



Personal details

Nationality: German

Languages: Native Germany, English

Date of birth: July 6, 1973

Research Topics

I am working in signal processing, information theory, communication theory and applied math. My research profile is the interface between communication engineering, data science and its mathematical treatment. The current research topics are:

- Sensor networks, communication for the internet of things
- 5G (6G) related research (new air interface, mmWave, massive MIMO & random access)
- Compressed sensing (CS), low-rank matrix recovery and dimension reduction
- Noncoherent and blind communication principles, Nonorthogonal waveforms,
- Time-frequency analysis and Gabor frame theory
- Dispersive communication channels and their info.-theoretic treatment

Selected Publications

I have more than 100 peer-reviewed journal and conference articles. The full list can be found on the websites given below.

- Low-rank&CS P. Jung and P. Walk, "Sparse Model Uncertainties in Compressed Sensing with Application to Convolutions and Sporadic Communication", book chapter, *Compressed Sensing and its Applications*, H. Boche, R. Calderbank, G. Kutyniok and J. Vybiral, Springer, 2015
- P. Jung, F. Kraemer and D. Stoeger, "Blind Demixing and Deconvolution at Near-Optimal Rate" *IEEE Trans. on Information Theory*, 64(2), 704-727, 2017
- R. Kueng and P. Jung, "Robust Nonnegative Sparse Recovery and the Nullspace Property of 0/1 Measurements", *IEEE Trans. on Information Theory*, 64(2), 689-703, 2017
- MassiveMIMO S. Haghghatshoar, P. Jung, G. Caire, "Improved Scaling Law for Activity Detection in Massive MIMO Systems", *ISIT*, 2018.
- Multicarrier P. Jung and G. Wunder, "The WSSUS Pulse Design Problem in Multicarrier Transmission", *IEEE Trans. on Communications*, 55(10):1918-1928, 2007.

- Limited Feedback G. Wunder, J. Schreck and P. Jung, “Nearly Doubling the Throughput of Multiuser MIMO Systems Using Codebook Tailored Limited Feedback Protocol”, *IEEE Transactions on Wireless Communications*, 11(11):3921–3931, 2012.
- J. Schreck, G. Wunder and P. Jung, “Robust Iterative Interference Alignment for Cellular Networks with Limited Feedback”, *IEEE Transactions on Wireless Communications*, 14(2):882–894, 2014
- UWB P. Walk and P. Jung, “Approximation of Löwdin Orthogonalization to a Spectrally Efficient Orthogonal Overlapping PPM Design for UWB Impulse Radio”, *Signal Processing*, 92(3):649–666, 2011.
- 5G Topics G. Wunder, H. Boche, T. Strohmer and P. Jung, “Sparse Signal Processing Concepts for Efficient 5G System Design”, *IEEE Access*, 2015
- CS and Sensor Networks G. Cao, P. Jung, S. Stanczak, and F. Yu. “Low Cost Error Correction for Multi-Hop Data Aggregation Using Compressed Sensing”, *IEICE Trans. on Information and System*, E97-D(2), 2014
- CS Imaging S. Augustin, S. Frohmann, P. Jung and W.H. Hübers, “Mask Responses for Single-Pixel Terahertz Imaging”, *Scientific Reports* 8(1), 2018

Employment history

since 04/12 **Technical University Berlin.**

01/12-03/12 Technical University Munich

01/10-12/11 **Technical University Berlin.**

06/01-12/03 Fraunhofer Heinrich-Hertz Institute

01/04-12/10 Fraunhofer German–Sino Lab for Mobile Communications

06/01-12/03 Fraunhofer Heinrich-Hertz Institute

11/00-05/01 Computing center at the DESY/IFH Zeuthen

Education

07/2007 **PhD thesis**, (*Dr.rer.nat., with distinction*), Technical University Berlin.
Weyl-Heisenberg Representations in Communication Theory

10/2000 **Diploma**, in *Physics*, Humboldt University Berlin.
Pion-Kaon Separation mit dem HERMES RICH Detektor

1992 graduated from math&physics class at Humboldt University Berlin
(Abitur, Spezialklasse Mathematik–Physik der Humboldt–Universität Berlin)

Research projects and funding

since 2016 **DFG-grant**, (*JU 2795/3*), priority program SPP 1798, “Compressed Sensing in der Informationsverarbeitung”.
Bilinear Compressed Sensing, [phase-II also recommended for funding, starting in 2019]

- 2018-2022 **DAAD**, Joint research and cooperation project with AIMS South Africa.
Non-Negative Structured Regression in Communication and Data Science
- 2013-2016 **DFG-grant**, (JU 2795/2).
Non-adaptive Methods for Dimension Reduction in Dispersive and Noncoherent Communication Channels
- 2010-2013 **DFG-grant**, (JU 2795/1).
Information-theoretic Description of Time-continuous, Doubly-Dispersive Communication Channels
- in 2016 **HIM**, Research grant for the Hausdorff trimester program “Mathematics of Signal Processing”, Hausdorff Research Institute for Mathematics (HIM), Bonn, Germany .

Teaching Experience

- since 2008 **Technical University Berlin**.
Compressed Sensing for Signal Processing and Applications (2-courses module since 2015),
Parameter Estimation and Compressed Sensing (lectures 2012-2015),
Banach Space Geometry and Measure of Concentration (seminar series, 2008-2009),
Estimation and Decision Theory in Communication Theory (lecture 2011-2012)
- 2011-2012 **Technical University Munich**.
Estimation Theory and Compressed Sensing (lecture)
- in 2015 **Technical University Dresden**.
Compressed Sensing (invited block lecture)

Selection of Invited Talks

- 2017 12th International Conference on Sampling Theory and Applications, SampTA 2017,
“Blind sparse recovery from superimposed non-linear sensor measurements”
- 2013 Matheon Workshop 2013 Compressed Sensing and its Applications, *“Low-complexity model uncertainties in compressed sensing with application to sporadic communication”*
- 2008 The 2008 IEEE Wireless Communications and Networking Conference, *“Pulse Shaping, Localization and the Approximate Eigenstructure of LTV Channels”*

Memberships

- IEEE Communication and Information Theory Society (IEEE ComSoc and ItSoc)
- VDE German Engineering Association
- DPG German Physics Association

Service and Administration

- Referee I act as a referee for several major journals and conferences in communication, signal processing, information theory and applied math. Including: IEEE Transactions on Information Theory, Signal Processing, IEEE Signal Processing Letters, IEEE Transactions on Wireless Communications, IEEE Transactions on Communications, SampTA, STIP-SampTA Guest editor

Supervisor I have supervised and co-supervised several diploma and M.Sc. theses on a variety of topics in time–frequency analysis, multicarrier transmissions and compressed sensing

■ Presence

personal Personal webpage at the TU Berlin
<http://user.tu-berlin.de/peter.jung>

CommIT@TUB The Communications and Information Theory Group at the TU Berlin
http://www.commit.tu-berlin.de/menue/mitarbeiter/dr_rer_nat_peter_jung

Google Scholar <http://scholar.google.de/citations?user=Jh5kItUAAAAJ>

Mendeley <http://www.mendeley.com/profiles/peter-jung/>

ResearchGate <http://www.researchgate.de/profiles/peter.jung>