

Univ.-Prof. Dr.-Ing. Wolfgang Karl Utschick  
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## Research

Wolfgang Utschick's research combines different areas of applied mathematics in various signal processing application domains as in the field of wireless communications. The main focus is on the development of algorithms and methods, which includes the analysis of fundamental properties as well as their utilization to design efficient algorithms. Since his doctoral studies, he has also been working on machine learning topics. He holds several patents in the field of signal processing and has authored and co-authored a great many of technical articles in international journals and conference proceedings.

## Academic Career

since 2021	Core Member of the newly founded Munich Data Science Institute
since 2021	Member of the Board of Deans of the School of Computation, Information and Technology (TUM)
since 2017	Dean of the ECE Department (TUM), currently serving in his 2 <sup>nd</sup> term
since 2017	Chair of the German Section of the IEEE Signal Processing Society
since 2011	Member of the Management Board of the ECE Department (TUM)
since 2011	Professor at TUM Asia & Singapore Institute of Technology
since 2002	Professor for Signal Processing (TUM)

## Education

1998	Dr.-Ing., ECE Department (TUM)
1993	Dipl.-Ing., ECE Department (TUM)
1987	Fachgebundene Hochschulreife (BOS Ingolstadt)
1985	Informationselektroniker (IHK München und Oberbayern)
1983	Nachrichtengerätetechnik (IHK München und Oberbayern)

## Research Interests

Wireless Communications, Multiantenna Systems, MIMO Communication Algorithms, MIMO Radar, Interference Cancellation, Channel Modeling, Parameter Estimation, Statistical Signal Processing, Artificial Intelligence, Machine Learning, Convex and Global Optimization, Information Theory.

## Awards/Honors

2021	IEEE Fellowship
2014	TUM's teaching Award "Freisemester für Lehre"
2013	Best Paper Award at the IEEE SPS SPAWC Workshop

2010	GOLD Best Paper Award at the IEEE Globecom Conference
2009	Best Paper Award at the IEEE Globecom Conference
2007	Best Paper Award by the German Society for Information Technology (ITG)
2007	Best Paper Award at the IEEE/ITG Workshop on Smart Antennas
2006	Student Association's Teaching Award
2000	Best Paper Award at the European Wireless Conference

Selected Publications: ([scholar.google.com](https://scholar.google.com): h-factor: 40, i10-index: 191)

A. Barthelme and W. Utschick. A machine learning approach to DoA estimation and model order selection for antenna arrays with subarray sampling. *IEEE Transactions on Signal Processing*, 69:3075–3087, 2021.

W. Utschick, C. Stöckle, M. Joham, and J. Luo. Hybrid LISA precoding for multiuser millimeter-wave communications. *IEEE Transactions on Wireless Communications*, 17(2):752–765, February 2018.

D. Neumann, T. Wiese, M. Joham, and W. Utschick. A bilinear equalizer for massive MIMO systems. *IEEE Transactions on Signal Processing*, 66(14):3740–3751, May 2018.

D. Neumann, T. Wiese, and W. Utschick. Learning the MMSE channel estimator. *IEEE Transactions on Signal Processing*, 66(11):2905–2917, January 2018.

W. Utschick and J. Brehmer. Monotonic optimization framework for coordinated beamforming in multi-cell networks. *IEEE Transactions on Signal Processing*, 60(4):1899–1909, April 2012.

D. A. Schmidt, C. Shi, R.A. Berry, M.L. Honig, and W. Utschick. Pricing algorithms for power control and beamformer design in interference networks. *IEEE Signal Processing Magazine*, 26(5):53–63, September 2009.

P. Tejera, W. Utschick, G. Bauch, and J. A. Nossek. Subchannel Allocation in Multiuser Multiple-Input–Multiple-Output Systems. *IEEE Transactions on Information Theory*, 52(10):4721–4733, October 2006.

M.T. Ivrlac, W. Utschick, and J. A. Nossek. Fading correlations in wireless MIMO communication systems. *IEEE Journal on Selected Areas in Communications*, 21(5):819–828, 2003.

M. Joham, W. Utschick, and J. A. Nossek. Linear transmit processing in MIMO communications systems. *IEEE Transactions on Signal Processing*, 53(8):2700–2712, August 2005.

W. Utschick. Tracking of signal subspace projectors. *IEEE Transactions on Signal Processing*, 50(4):769–778, 2002.

Filed Patents: ([patents.google.com](https://patents.google.com))

WO2002021721A1, US9184813B2, US8379747B2, US8031584B2, US9107235B2, US8934931B2, US8724743B2, US9088316B2, US7039442B1, US7039442B1, JP2010093825A, JP2011015399A, EP1661264B1, EP1965508B1, EP1863248B1, EP2525523B1, EP2852238A1, EP2131507B1, EP2134003B1, EP1704655B1, EP2394206B1, EP2273716B1, EP2852238A1, DE102016001308A1, DE102015012843A1, DE102006032982B4, DE102006032982B4, DE102015012843A1, DE102018001499B3