

Dr. Wolfgang Kellerer

Professor

Technical University of Munich (TUM)

Department of Electrical and Computer Engineering

Chair of Communication Networks



Personal Data

Date of birth: 13. Juli 1970

Address: Technische Universität München
Lehrstuhl für Kommunikationsnetze (LKN)
Arcisstr. 21, 80333 München, Germany

Tel: +49-89-289-23500 (Sekretariat) / - 23501 (direkt)

Fax: +49-89-289-23523

Email: wolfgang.kellerer@tum.de

Web: <http://www.lkn.ei.tum.de>

Research

H-Index (Google Scholar): 57 (https://scholar.google.de/citations?user=6L4GH_wAAAAJ)

Internationally recognized fundamental research in the area of adaptive, programmable communication networks. Focus is on flexible and adaptive resource management and control of communication systems to support heterogeneous requirements including ultra-low latencies, tactile control, energy efficiency and resilience. Therefore, he defined the world-first metric for the measurement of flexibility in communication networks. Research methods include measurements, optimization, cross-layer-design, performance evaluation and artificial intelligence for networking.

Selected Research Projects with Leadership Position

- since 2021 Co-coordinator of the German BMBF 6G Research Hub 6G-life (70 Mio €)
- since 2021 Coordinator of the 6G Future Lab Bavaria (StMWi, 4 Mio €)
- since 2020 Scientific chairman of the plattform "Thinknet 6G"
- since 2019 Coordinator of the 5G Testbed Bavaria with focus on eHealth (1,5 Mio €)
- 2015 DFG SPP „Cyber Physical Networking“ (Co-author of this DFG priority program)
- 2015 - 2021 European Commission ERC Consolidator Grant FlexNets (2 Mio €)
„Quantifying Flexibility in Communication Networks“

Scientific Positions and Contributions

- since 07/2012 Full Professor for Communication Networks, Department of Electrical and Computer Engineering (ECE), Technical University of Munich (TUM)
- since 10/2021 Speaker of the Study Deans of the TUM School of Computation, Information and Technology (CIT) (in the course of formation)
- since 10/2020 Dean of Studies of the ECE department
- 2002 – 2012 DOCOMO Communications Laboratories Europe GmbH
European research institute of the Japanese Mobile Operator NTT DOCOMO
Last position: director of the research unit for communications engineering and

- mobile networks (ca. 30 research staff)
- 2003 – 2012 External lecturer at TUM „Advanced Network Architectures and Services“
- 2002 Obtained Dr.-Ing. degree in Electrical Engineering from TUM
- 2001 Research Scholar at Standford University, California USA
- 1996 – 2001 Memeber of the research staff at TUM ECE and PhD student
- 1990 – 1995 Studies in Electrical Engineering and Information Technology, TUM

Scientific Awards (Selection – complete list at

<https://www.ce.cit.tum.de/en/lkn/team/mitarbeiter/kellerer-wolfgang/awards/>)

- 2020 Teaching Award of the ECE Department 2020
- 2020 VDE award for outstanding community contributions 2020 (German EE society)
- 2020 IEEE ComSoc Selected Publication Award
- 2019 ACM SIGCOMM Best of CCR 2019 Award
- 2018 IEEE ICC 2018 Best Paper Award
- 2015 ERC Consolidator Grant FlexNets
„Quantifying Flexibility in Communication Networks“
- 2011 DOCOMO Euro-Labs Company Award 2011
- 2008 VDE ITG-Award 2008 für hervorragende Veröffentlichung (VDE ITG)

Contributions to Societies and Memberships

- since 2021 Core Member Munich Data Science Institute (MDSI)
- 2018-21 Guest Editor-in-Chief für IEEE Transactions on Network and Service Management Special Issues (2018, 2019, 2021 und 2022) on Softwarized Networks
- 2018-20 Scientific Director TUM/LMU Center for Digital Technology and Management
- since 2018 Member of the Munich Institute for Robotics and Machine Intelligence (MIRMI)
- since 2018 Member of the Scientific Advisory Board d. Max-Planck-Institute for Informatics
- since 2018 Area Editor Network Virtualization und member of the Editorial Board IEEE COMST
- since 2018 Member of the Editorial Board IEEE TNSM
- 2018 – 2020 Member of the Editorial Board IEEE Networking Letters
- since 2017 Member of the Scientific Committee for Regulatory Affairs of the German FCC (Bundesnetzagentur)
- 2015-20 Member of the Advisory Board of Fraunhofer FOKUS, Berlin
- since 2013 Member of the Board of Directors des LMU/TUM CDTM
- since 2012 Member of the VDE/ITG Focus Group 5.2 Communication Networks
- since 2009 Member of the GI/ITG Focus Group Communication and Distributed Systems
- 2009 IETF RFC RFC 5631: Session Initiation Protocol (SIP) Session Mobility
- 2005 Co-founder of the IEEE Conference on Peer-to-Peer Networks
- since 2002 Member in more than 100 Program Committees of international conferences, e.g. IEEE INFOCOM, IEEE P2P, IEEE ICC, IEEE Globecom, ACM Multimedia, ACM CoNEXT, ITC

List of professional activities:

<https://www.ce.cit.tum.de/en/lkn/team/mitarbeiter/kellerer-wolfgang/profess-act/>

Selected Publications (complete list at

<https://www.ce.cit.tum.de/en/lkn/team/mitarbeiter/kellerer-wolfgang/publications/>
or https://scholar.google.de/citations?user=6L4GH_wAAAAJ)

1. W. Kellerer, P. Kalmbach, A. Blenk, A. Basta, M. Reisslein, S. Schmid. Adaptable and data-driven softwarized networks: Review, opportunities, and challenges. Proceedings of the IEEE 107 (4), 711-731
2. M. Gürsu, M. Vilgelm, A. Martinez Alba, M. Berioli, W. Kellerer: Admission Control Based Traffic-Agnostic Delay-Constrained Random Access (AC/DC-RA) for M2M Communication. IEEE Transactions on Wireless Communications (Volume: 18, Issue: 5), 2019, 2858 - 2871
3. A. Basta, A. Blenk, M. Hoffmann, H. Morper, M. Hoffmann, W. Kellerer. Towards a Cost Optimal Design for a 5G Mobile Core Network based on SDN and NFV. IEEE Transactions on Network and Service Management (TNSM). 2017.
4. AS. Thyagaturu, A. Mercian, MP. McGarry, M. Reisslein, W. Kellerer Software defined optical networks (SDONs): A comprehensive survey, IEEE Communications Surveys & Tutorials 18 (4), 2738-2786, 2016
5. J. Guck, M. Reisslein, W. Kellerer. Function Split between Delay-Constrained Routing and Resource Allocation for Centrally Managed QoS in Industrial Networks. IEEE Transactions on Industrial Informatics. 2016; 12(6): 2050 - 2061.
6. A. Blenk, A. Basta, M. Reisslein, W. Kellerer. Survey on network virtualization hypervisors for software defined networking. IEEE Communications Surveys & Tutorials 18 (1), 655-685, 2015
7. M. Jarschel, T. Zinner, T. Hoßfeld, P. Tran-Gia, W. Kellerer. Interfaces, attributes, and use cases: A compass for SDN. IEEE Communications Magazine 52 (6), 210-217, 2014
8. K. Römer, B. Ostermaier, F. Mattern, M. Fahrmaier, W. Kellerer. Real-Time Search for Real-World Entities: A Survey. Proceedings of the IEEE. Special Issue on Sensor Network Applications. 2010; 98(11): 1887 - 1902.
9. R. Shacham, H. Schulzrinne, S. Thakolsri, W. Kellerer. Ubiquitous Device Personalization: The Next Generation of IP Telephony. ACM Transactions on Multimedia Computing, Communications, and Applications (TOMCCAP). 2007; 3(2): Article No. 12.
10. S. Khan, M. Sgroi, Y. Peng, E. Steinbach, W. Kellerer. Application-driven Cross Layer Optimization for Video Streaming over Wireless Networks. IEEE Communications Magazine. Special Issue on Cross-Layer Protocol Engineering. 2006; 44(1): 122-130.

Patents

more than 45 international patent applications, of which 37 are granted to date

<https://www.ce.cit.tum.de/en/lkn/team/mitarbeiter/kellerer-wolfgang/patents/>

Standardization

<https://www.ce.cit.tum.de/en/lkn/team/mitarbeiter/kellerer-wolfgang/standards/>

- Contribution to ETSI NFV participant since 2018; invited plenary presentation on "Network Flexibility" to the ETSI NFV#26 face-to-face Meeting in Sofia Antipolis, France, May 20-25, 2019.
- Support of 3GPP standardization on 5G Rel. 16 and Rel. 17 through industrial collaboration since 2018.
- Contribution to IETF / IRTF Network Function Virtualization Research Group (NFVRG); invited presentation to IETF 99 / IRTF NFVRG on "Using Flexibility as a Measure to Evaluate Softwarized Networks", Prague, Czech Republic, July 16-21, 2019.
- Contributions to 3GPP standardization in SA1 in the area of Mobile Traffic Management and, in particular, User Plane Congestion Notification (UPCON).
- RFC 5631: R. Shacham, H. Schulzrinne, S. Thakolsri, W. Kellerer. Session Initiation Protocol (SIP) Session Mobility , October 2009. - RFC 5631 - part of the latest SIP standard update.
- Elected Vice Chairman of WG2 (Service Architecture for the Wireless World) of the Wireless World Research Forum (WWRF) for 2004 and 2005.
- Contribution to 3GPP standardization in SA1 and SA2 in the area of Multimedia Session Continuity - for an overview on the topic see the technical study document TR 23.893
- J. Lee, H. Schulzrinne, W. Kellerer, Z. Despotovic. SIP URI Service Discovery using DNS-SD, IETF Internet Draft, SIP WG, draft-lee-sip-dns-sd-uri-02, November 2007 (I-D)
- H. Schulzrinne, R. Shacham, S. Thakolsri, W. Kellerer. Composing Presence Information. IETF Internet Draft, SIPPING WG, draft-schulzrinne-simple-composition-02, June 2006. (I-D)
- R. Shacham, H. Schulzrinne, W. Kellerer, S. Thakolsri. Specifying Media Privacy Requirements in the Session Initiation Protocol (SIP). IETF Internet Draft, SIPPING WG, draft-shacham-sip-media-privacy-02, June 2006. (I-D)

PhD student supervision

17 PhD students graduated <https://www.ce.cit.tum.de/en/lkn/research/dissertations/>

1 Habilitation <https://www.ce.cit.tum.de/en/lkn/research/habilitations/>

Teaching

2 undergrad courses, 2 graduate courses, 4 seminars and 4 labs

<https://www.ce.cit.tum.de/en/lkn/teaching/>

Teaching Award of the ECE Department 2020

Press and Media (selection) <https://www.ce.cit.tum.de/en/lkn/press-articles-podcasts/>

- Prof. Wolfgang Kellerer zur Entwicklung der nächsten Mobilfunkgeneration „Bei 6G wird der Mensch im Mittelpunkt stehen“ (TUM, 24.3.2021)
- Wirtschaftsminister begrüßt Förderzusage - Aiwanger: "Mit einer gezielten Förderung können wir Bayerns Vorreiterrolle beim Thema 6G ausbauen" (30.6.2021)
- 6G-LIFE - BMBF FUNDS 6G RESEARCH HUB IN DRESDEN AND MUNICH WITH 70 MILLION EUROS (30.6.2021)

- Bayerische Staatsregierung (24.3.2021): <https://www.bayern.de/bayerns-wirtschaftsstaatssekretaer-gibt-startschuss-zur-umsetzung-der-bayerischen-6g-initiative/>
- 250 Millionen Euro für die 6G-Entwicklung (FAZ 28.6.2021)
- Bayerischer Rundfunk: TU München erforscht neuen Mobilfunkstandard: Was bringt uns 6G? | BR24 (24.3.2021)
- FAZ Podcast: Warum wir jetzt 6G erforschen, sagt Wolfgang Kellerer (faz.net)
- Deutschlandfunk Computer und Kommunikation (Podcast): Zukunftslabor: Die TU München will sich schwerpunktmäßig mit 6G beschäftigen
- Süddeutsche Zeitung vom 26.3.2021 – Bayern – Leute des Tages: Wolfgang Kellerer