Dr. Wolfgang Kellerer

Full Professor

Technical University of Munich (TUM)

School of Computation, Information and Technology (CIT)

Department of Computer Engineering

Chair of Communication Networks

Personal Data

Date of birth:	13. Juli 1970
Address:	Technische Universität München
	Lehrstuhl für Kommunikationsnetze (LKN)
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Research

H-Index (Google Scholar): 60 (https://scholar.google.de/citations?user=6L4GH_wAAAAJ)
Internationally recognized fundamental research in the area of adaptive, software-defined, programmable communication networks and its application to systems such as next generation mobile communications system like 6G. 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 Computer Engineering (CE), School of Computation Information and Technology (CIT), Technical University of Munich (TUM)
since 2022	Scientific Director of the TUM Venture Labs Robotics, AI & Communications
2020 - 2022	Dean of Studies

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 Stanford University, California USA
1996 – 2001 Member 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/)
2023 Best Demo Award at IEEE SECON 2023
2023 Best Paper Award at IEEE CCNC 2023
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
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)

(* first author is a PhD student of Wolfgang Kellerer)

1. *O. Ayan, S. Hirche, A. Ephremides, W. Kellerer: Optimal Finite Horizon Scheduling of Wireless Networked Control Systems. IEEE/ACM Transactions on Networking. 2023: 1-16.
2. *S. Ayvasik, F. Mehmeti, E. Babaians, W. Kellerer: PEACH: Proactive and Environment-Aware Channel State Information Prediction with Depth Images. Proceedings of the ACM on Measurement and Analysis of Computing Systems. 2023; 7 (1): 1–27.
3. 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. 2019; 107 (4): 2019, 711 – 731.
4. *Blenk A, Basta A, Reisslein M, Kellerer W: Survey on network virtualization hypervisors for software defined networking. IEEE Communications Surveys & Tutorials. 2015; 18 (1): 655-685.
5. *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
6. *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.
7. 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
8. *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.
9. *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
10. 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
11. K. Römer, B. Ostermaier, F. Mattern, M. Fahrmair, 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.
12. 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.
13. 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
26 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