Gerhard Kramer
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Gerhard Kramer is Professor of Communications Engineering at the Technical University of Munich (TUM). Since October 2019, he is the university's Senior Vice President for Research and Innovation, an office that helps scientists acquire research funds from the government and corporate sectors, and that supports technology transfer. This includes national and international research projects, commercial co-operations, patents and licensing, and entrepreneurship in the form of technology-based start-ups aided by venture labs. The office further supports research across the university through the TUM graduate school, a talent factory for postdocs, the faculty tenure-track program, and the sustainability office.

Gerhard Kramer received the B.Sc. and M.Sc. degrees in electrical engineering from the University of Manitoba in 1991 and 1992, respectively, and the Dr. sc. techn. degree from ETH Zurich in 1998. From 1998 to 2000, he was with Endora Tech AG in Basel, Switzerland, as a communications engineering consultant. From 2000 to 2008, he was with the Math Center at Bell Labs in Murray Hill, NJ, as a Member of Technical Staff. He joined the University of Southern California (USC), Los Angeles, CA, as a Professor of Electrical Engineering in 2009. He joined TUM in 2010 as Alexander von Humboldt Professor.

His personal research interests are primarily in information theory, communications theory, and coding, with applications to wireless, copper, and optical fiber networks.

He has made several contributions to communications research. His doctoral thesis introduced causally-conditioned directed information, an idea that characterizes information flow in networks. The thesis was awarded an ETH medal in 1999. During his doctoral studies he also worked on linear cryptanalysis of block ciphers and on code time division multiple access (CTDMA).

At Bell Labs, Gerhard Kramer worked mainly on Shannon theory for interference, relay, and broadcast communications. He also developed information theory for empirical coordination, multiple description source coding, channel coding for multi-input multi-output (MIMO) channels, extrinsic information transfer (EXIT) charts and the "area property", wiretap channels, optical fiber capacity, and digital subscriber line (DSL) channel estimation. He received the 2005 Stephen O. Rice Prize Paper Award of the IEEE Communications Society for his work on coded modulation for MIMO, the 2011 Vodafone Innovations Prize for his work on relay communications, and a 2014 Paper Award of the European Association for Signal Processing (EURASIP) for work on wiretap channels. He was a Thomson Reuters Highly Cited Researcher for high impact work in Computer Science during 2002-2014.

At Bell Labs, he played key roles in initiating two applied projects. First, Lucent's transition to using higher-order modulation for long-haul optical fiber links. Second, Alcatel-Lucent's transition to using vectoring for DSL. He was a member of two teams recognized by Bell Labs teamwork awards: a long-haul optical fiber team in 2002 and a high-capacity wireless team in 2003. He received a 2012 Thomas Alva Edison Patent Award from the Research & Development Council of New Jersey for an invention that improves DSL channel estimation. He has 17 issued patents.

At TUM, he has supported numerous doctoral researchers and postdocs on a broad range of topics in communications engineering, including wireless (coded modulation, precoding, relaying, waveforms), optical (capacity, phase noise, shaping), and basic theory (compression, low-latency codes, secrecy, stealth). He personally likes to work on multi-user information theory and the capacity of fiber-optic channels, and he is proud of his research staff's independent success on information theory and communications algorithms. He received a 2015 Lecturer Award from the Student Association of the TUM Department of Electrical and Computer Engineering for teaching Digital Communications.

Gerhard Kramer is an IEEE Fellow since 2010. He has been active in the IEEE Information Theory Society, including co-founding and consolidating its global schools program since 2008 and serving as the Society’s president in 2013. He has chaired, or is chairing, several of the Society’s flagship events, including the 2023 IEEE International Symposium on Information Theory (ISIT) in Taipei, ISIT 2017 in Aachen, ISIT 2014 in Honolulu (TPC Chair), ISIT 2008 in Toronto (TPC Chair), and the 2017 IEEE Information Theory Workshop in Kaohsiung. He served as Associate Editor for Shannon Theory for the IEEE Transactions on Information Theory from 2006-2008. He has been a member of several IEEE awards committees since 2011.

He was elected to the Bavarian Academy of Sciences and Humanities (Bayerische Akademie der Wissenschaften or BAdW) in 2015. He is a member of the BAdW Technology Forum, and of the selection committee of the BAdW Young Academy.

Since 2013, Gerhard Kramer serves as a member of the Board of Curators of the Eduard Rhein Foundation, an independent, non-profit foundation whose exclusive interest is to present monetary awards to individuals for achievements promoting the public welfare. Since 2016, he serves as a mentor for the Max Weber Program for highly talented students enrolled at universities in Bavaria. Since 2020, he is a member of the Board of Curators of the Max Planck Institute of Quantum Optics.