

# Gerhard Kramer

## Curriculum Vitae, July 28, 2018

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### Work Address

Technical University of Munich  
Chair of Communications Engineering  
D-80290 Munich Germany

Web: <http://www.lnt.ei.tum.de>  
Email: [gerhard.kramer@tum.de](mailto:gerhard.kramer@tum.de)  
Phone: +49.89.289.23491

### Education

- *Dr. sc. techn. (Doktor der technischen Wissenschaften)*, ETH Zürich, Switzerland 1998
- *Post Diploma in Information Technology*, ETH Zürich, Switzerland 1996
- *Master of Science*, Univ. Manitoba, Winnipeg, MB, Canada 1992
- *Bachelor of Science in Engineering*, Univ. Manitoba, Winnipeg, MB, Canada 1991

### Positions Held

- *Technical University of Munich (TUM)*, Germany Oct 2010-  
Alexander von Humboldt Professor and Chair of Communications Engineering
- *University of Southern California (USC)*, Los Angeles, CA, USA 2009-2013  
Professor, Dept. of Electrical Engineering, Jan 2009 - Sep 2011  
Adjunct Research Professor, Oct 2011 - Dec 2013
- *Bell Labs, Alcatel-Lucent*, Murray Hill, NJ, USA 2000-2008  
Member of Technical Staff, Mathematical and Algorithmic Sciences Research Center
- *Endora Tech AG*, Basel, Switzerland 1998-2000  
Communications Engineering Consultant

### Principal Honors & Awards

#### **Professional**

- *IEEE Information Theory Society Distinguished Lecturer*, 2015-2016
- *Thomson Reuters Highly Cited Researcher* in Computer Science, 2014-2016
- *Lecturer Award (Dozentenpreis)*, selected by the TUM ECE Dept. Student Association, 2015
- *Member, Bavarian Academy of Sciences and Humanities*, 2015
- *IEEE Information Theory Society President*, 2013
- *Vodafone Innovations Prize*, for fundamental research on cooperative communication networks, 2011
- *Alexander von Humboldt Professorship*, 2010
- *IEEE Fellow*, for contributions to coded modulation, iterative decoding, and cooperative commun., 2010
- *Bell Labs President's Gold Award*, member of the Bell Labs Layered Space-Time (BLAST) team, 2003
- *ETH Medal*, for outstanding work on the doctoral dissertation, 1999

#### **Papers and Patents**

- *Best Paper Award*, EURASIP Journal on Wireless Communications and Networking, 2014
- *Thomas Alva Edison Patent Award*, Research & Development Council of New Jersey, 2012
- *Stephen O. Rice Prize Paper Award*, IEEE Communications Society, 2005

## **Academic & Professional Assignments & Service**

### **TUM**

- Int. Graduate School of Science and Engineering (IGSSE), Deputy Director, 2016-
- University Awards Committee, 2014-
- University Appointment and Tenure Board, 2012-
- ECE Dept. Tenure Track Assistant Prof. Mentor, 2016-, 2017-
- ECE Dept. Bachelor Study Exam Board, 2016-
- ECE Dept. Gender Equality Officer, 2015-
- ECE Dept. Master of Science in Communications Engineering (MSCE) Program, Co-Director, 2010-
- *Past*: Institute for Advanced Study Advisory Council (2011-17); ECE Dept. Strategy Committee (2011-14); “EI nach Garching” Task Force (2014-15); ECE Dept. Committee for Equal Opportunity (Chair, 2014-18); numerous W3 Prof. search committees (one as chair); one W2 Prof. evaluation

### **Bavarian Academy of Sciences & Humanities (BAdW)**

- Symposium: Informationsübertragung mit Photonen, Apr 2018
- Selection Committee, Junges Kolleg, 2017-
- Forum Technologie, 2016-

### **Bavaria & Germany (selected assignments)**

- Vertrauensdozent, Bayerische EliteAkademie, 2017-
- Mentor and Selection Committee, Max Weber Program, 2016-
- Board of Curators of the Eduard-Rhein Foundation, 2013-
- Information and System Theory Technical Committee (Fachausschuss 5.1), VDE ITG, 2011-

### **Evaluator & Examiner**

- Chair of panel evaluating the Department of Electrical Engineering, Chalmers University, Sweden, 2018
- Member of, and external evaluator for, numerous professor search committees in Germany since 2011
- External examiner of 4 Habilitations in France
- External examiner of 46 Dr. / Ph.D. dissertations in Australia, Austria, Canada, Denmark, Finland, France, Germany, Hong Kong, Israel, Japan, Singapore, Spain, Sweden, Switzerland, UK, USA

### **Visiting Professor & Scientist**

- Otto Mønsted Guest Professor, Dept. of Photonics Engineering, DTU, Lyngby, Denmark, 2017-2018
- Visiting Scientist, Dept. of Electrical Engineering and Inf. Technology, Lund Univ., Sweden, 2007-2008
- Visiting Professor, School of Electrical Engineering, Korea University, Seoul, South Korea, 2007
- Adjunct Assistant Professor, Dept. of Electrical Engineering, Columbia Univ., NY, USA, 2002 & 2005

### **Short Courses & Tutorials**

Ferienakademie Sarntal, Südtirol, short course of 2 weeks (7 in total, courses since 2017 are listed)

- Redundancy & Irrelevance in Source & Channel Coding (for Bachelor & Master students), Sep-Oct 2018
- Compressed Sensing (for Bachelor & Master students), Sep 2017

Advanced Information Theory (23 in total, courses/tutorials since 2017 are listed)

- short course (1 week), Indian Institute of Technology Kanpur, India, Mar 2018
- short course (3 weeks), Technical University of Denmark, Lyngby, Denmark, Aug 2017
- short course (3 lectures), IEEE North American School Inf. Theory, Atlanta, GA, Jun 2017

### **Munich & Local Workshops** (22 in total, selected recent events are listed)

- Co-Organizer, TUM-Eurecom Workshop on Secure Communications, Munich, Jul 2018
- Co-Organizer, Munich Workshop on Physical Unclonable Functions (MPUF), Nov 2017
- Chair, Munich Workshop on Information Theory of Optical Fiber (MIO), Dec 2014-2016
- Co-Organizer, Claude Shannon 100th Birthday Celebration, Heinz Nixdorf Museum, Germany, May 2016

### **IEEE (Institute of Electrical & Electronics Engineers)**

- Richard W. Hamming Medal Committee, 2014-2017
- Alexander Graham Bell Medal Committee, 2011-2014
- Technical Activities Board, 2013

### **IEEE Information Theory Society**

#### Elected Positions and Committees

- President (2013), 1st Vice President (2012), 2nd Vice President (2011)
- Board of Governors, 2009-2015
- Numerous committees and subcommittees since 2005

#### Editorships

- Foundations and Trends in Communications and Information Theory, 2012-
- Associate Editor for Shannon Theory, *IEEE Trans. Inf. Theory*, 2006-2008
- Guest Editor, *IEEE Trans. Inf. Theory* Special Issue, 2007
- Publications Editor, *IEEE Trans. Inf. Theory*, 2004-2005

#### Conference and Workshop Organization

- General Program Co-Chair: ISIT 2017 (Aachen), ITW 2017 (Kaohsiung)
- Technical Program Co-Chair: ISIT 2014 (Honolulu), ISTC 2014 (Bremen), ISIT 2008 (Toronto)
- Technical Program Committees: over 40 in total

#### Schools of Information Theory (involved with 29 in total)

- Europe (9 schools): 2012 (Co-Chair), 2013- (Advisor)
- North America (12 schools): 2008-2010 (Founding Co-Chair), 2011- (Advisor & Support)
- Africa, Australia, East Asia, India (7 schools): 2014-2016 (Support)
- Latin American School (1 school): 2018 (Advisor)

### **IEEE Communications Society**

#### Conference Organization & Standing Committee

- Technical Program Co-Chair: ISWCS 2011 (Aachen)
- Emerging Technologies Committee, 2009-2011
- Technical Program Committees: over 45 in total

## Doctoral & Postdoc Supervision

### **Current**

#### Doctoral Thesis Supervisor

1. Mustafa Cemil Coşkun, Low-latency coding and channel estimation. 2017- (joint with DLR)
2. Delcho Donev, Low-latency waveforms and coding. 2017- (joint with DLR)
3. Javier García, Fiber optic channels. 2016-
4. Thomas Jerkovits, Channel coding. 2016- (with DLR)
5. Fabian Steiner, Coded modulation. 2016-
6. Tobias Prinz, Polar codes. 2016-
7. Peihong Yuan, Coded modulation. 2015-
8. Amir Mehdi Ahmadian, Massive MIMO. 2015- (with Nokia)
9. Marcin Pikus, Shaping and coding. 2015- (with Huawei)
10. Patrick Schulte, Shaping and coding. 2014-
11. Markus Staudacher, Massive MIMO. 2014-
12. Lars Palzer, Compression of sparse sources. 2014-
13. Onur Günlü, Physical layer security. 2014-
14. Rana Ali Amjad, Information theory and machine learning. 2014-
15. Andrei Nedelcu, Information theory for MIMO wireless. 2012-

### **Past** (not including Bell Labs)

#### Dr. Ing. / Ph.D.

1. Stefan Dierks, Dr. Ing. TUM, Feb 2018; Multiple Antenna Precoding: Indoor Communications and EIRP
2. Hannes Bartz, Dr. Ing. TUM, Apr 2017; Algebraic Decoding of Subspace and Rank-Metric Codes
3. Markus Stinner, Dr. Ing. TUM, Sep 2016; Spatially Coupled LDPC Codes on the Binary Erasure Channel
4. Marwa El Hefnawy, Dr. Ing. TUM, Dec 2015; Spectral Efficiency of Faster-than-Nyquist Signals
5. Joschi Brauchle, Dr. Ing. TUM, Dec 2015; Algebraic Decoding of Reed-Solomon and Related Codes
6. Michael Heindlmaier, Dr. Ing. TUM, Oct 2015; Network Coding for Relay and Broadcast Channels
7. Onurcan İşcan, Dr. Ing. TUM, Dec 2014; Design of Communication Systems for Two-Way Relaying
8. Hassan Ghozlan, Ph.D. USC, Sep 2014; Capacity of Channels with Nonlinearity and Phase Noise
9. Tobias Lutz, Dr. Ing. TUM, Aug 2014; Coding for Half-Duplex Relay Networks and The Trapdoor Channel
10. Ronald Böhnke, Dr. Ing. Universität Bremen, Aug 2014; MIMO-OFDM Communications
11. Jie Hou, Dr. Ing. TUM, Aug 2014; Coding for Relay Networks & Effective Secrecy for Wire-Tap Channels
12. Mohit Thakur, Dr. Ing. TUM, Mar 2014; Relay Positioning for Multicast Relay Networks
13. Georg Zeitler, Dr. Ing. TUM, Mar 2012; Low-Precision Quantizer Design for Communication Problems

#### Postdoc / Habilitation

1. Georg Böcherer, Habilitation 2013-17; Postdoc, 2012-13; joined Huawei in Paris
2. Bernhard Geiger, Postdoc, 2014-17; continued Schrödinger Fellowship at TU Graz
3. Yongpeng Wu, Postdoc, 2017; joined Shanghai Jiao Tong University as Research Professor
4. Youlong Wu, Postdoc, 2014-17; joined ShanghaiTech University as Assistant Professor
5. Roy Timo, Postdoc, 2014-16; joined Ericsson in Stockholm
6. Shirin Saeedi Bidokhti, Postdoc, 2012-16; continued postdoc at Stanford University
7. Mansoor Yousefi, Postdoc, 2012-16; joined Telecom ParisTech as Assistant Professor
8. Luca Barletta, Postdoc, 2012-15 ; joined Politecnico di Milano as Assistant Professor
9. Stefano Rini, Postdoc, 2011-12; joined National Chiao-Tung University as Assistant Professor
10. Christoph Hausl, Habilitation, 2010-13; joined Rohde & Schwarz in Munich

## Invited Talks & Lectures

### **Keynote, Plenary & Distinguished Lectures** (30 in total, talks since 2018 are listed)

- “Information Theory for Selected Optical Fiber Models,” Keynote, *ShanghaiTech Workshop on Information, Learning, and Decision (SWILD)*, Shanghai, China, Jun 30, 2018
- “How to Shape and Code Symbols for High-Rate Communications,” Keynote, *ECE Dept. Symposium*, Ben Gurion Univ., Beersheba, Israel, May 14, 2018
- “Information Theory and Strategies for Cloud-RAN Downlink Channels,” Keynote, *Iran Workshop Commun. Inf. Theory*, Sharif Univ., Tehran, Iran, Apr 25, 2018

### **Invited Talks at Universities, Industrial Labs & Workshops** (150 in total, talks since 2018 are listed)

- “How to Shape and Code Symbols for High-Rate Communications,” *Ollendoff Minerva Center Lecture*, Technion, Haifa, Israel, May 13, 2018
- “Information Theory for a Few Models Inspired by Optical Fiber Communication,” *Eindhoven Workshop on Optical Communications*, TU Eindhoven, The Netherlands, Apr 9, 2018
- “Information Theory for Cloud-RAN Downlink Channels,” Bar Ilan Univ., Ramat Gan, Israel, Mar 13, 2018
- “Coding and Capacity for Cloud-RAN Downlink Channels,” *Ollendoff Minerva Center Lecture*, Technion, Haifa, Israel, Feb 28, 2018
- “Information Theory for Simplified Optical Fiber Models,” *ITG-Workshop 5.3.1*, Hamburg, Germany, Feb 22, 2018

### **Invited Talks for Local Audiences** (27 in total, talks since 2017 are listed)

- “Information Theoretic Models with Block Fading and Fast Feedback”, *TUM-COM Workshop on Ultra-Reliable Low-Latency Communications and Applications for 5G*, Schneefernerhaus, Zugspitze, Jul 6, 2018
- “How to Create a Successful Industry-University Cooperation,” Panel Organizer and Moderator, *TUM CoC COM Industry Day*, Munich, Jun 21, 2017
- “My Experience with Grant Proposals,” *TUM Tenure Track Academy Retreat*, Raitenhaslach, Jun 13, 2017
- “Information Theory and Applications to Optical Fiber,” *Munich Humboldt Club*, Munich, Jun 12, 2017
- “JH Codes und Kunst,” *Verabschiedungs-Kolloquium für Prof. Johannes Huber*, Erlangen, Mar 31, 2017

## University Teaching

### **TUM** (since 2010)

- Bachelor courses: Nachrichtentechnik, Nachrichtentechnik 2, Mobile Communications
- Master courses: Information Theory, Multi-User Information Theory
- TUM Asia Bachelor course: Digital Communications, 2011-

### **USC** (2009-2010)

- Information Theory (EE-565a), Fall 2009
- Multi-User Information Theory (EE-599), Spring 2009

**Other:** 7 courses from 1999-2008 at ETH, Columbia, Korea, Lund & Aalborg Universities