

# Giuseppe Durisi: Curriculum Vitae

## Work address:

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RESEARCH	Information theory, communication theory, machine learning
PERSONAL	Born on November 28, 1977 in Turin, Italy; Italian citizenship; male; married with two children; languages: Italian, English, German, Swedish
EDUCATION	<ul style="list-style-type: none"><li>◇ Mar. 2012: Chalmers University of Technology, Sweden Docent diploma in Information Theory</li><li>◇ Mar. 2006: Politecnico di Torino, Italy Ph.D. in electrical and communication engineering<ul style="list-style-type: none"><li>· Doctoral dissertation: <i>Noncoherent fading channels: capacity and coding</i></li><li>· Advisor: Professor Sergio Benedetto (Politecnico di Torino, Italy)</li></ul></li><li>◇ Nov. 2001: Politecnico di Torino, Italy Telecommunications Engineering Diploma [M.Sc.], <i>summa cum laude</i><ul style="list-style-type: none"><li>· Diploma dissertation: <i>Analysis and simulation of an ultra-wideband communication system over a multipath channel</i></li><li>· Advisors: Professor Sergio Benedetto (Politecnico di Torino, Italy), Dr. Giovanni Romano (Telecom Italia Lab, Turin, Italy)</li></ul></li></ul>
ACADEMIC WORK EXPERIENCE	<ul style="list-style-type: none"><li>◇ Oct. 2018-current: Co-director of Chalmers artificial-intelligence research center (CHAIR)</li><li>◇ Feb. 2016-current: Co-director information and communication technology (ICT) area of advance at Chalmers University of Technology, Sweden</li><li>◇ Jan. 2017-current: Professor at Chalmers University of Technology, Sweden</li><li>◇ Dec. 2013-Dec. 2016: Associate professor at Chalmers University of Technology, Sweden</li><li>◇ Nov. 2010-Nov. 2013: Assistant professor at Chalmers University of Technology, Sweden</li><li>◇ Apr. 2012: Guest professor at Vienna University of Technology, Austria</li><li>◇ Feb. 2008-Oct. 2010: Senior researcher at ETH Zurich, Switzerland</li><li>◇ Feb. 2006-Jan. 2008: Postdoctoral researcher at ETH Zurich, Switzerland</li><li>◇ Nov. 2004-Nov. 2005: Visiting researcher at ETH Zurich, Switzerland</li><li>◇ Mar. 2004-Jul. 2004: Visiting researcher at Università di Pisa, Italy</li><li>◇ Jan. 2002-Jan. 2006: Junior researcher at Istituto Superiore Mario Boella, Turin, Italy</li></ul>
INDUSTRIAL WORK EXPERIENCE	<ul style="list-style-type: none"><li>◇ Sep. 2018-current: Visiting researcher at Qamcom, Sweden</li><li>◇ Jan. 2014-2017: Visiting researcher at Ericsson Research, Sweden</li><li>◇ Nov. 2002-Apr. 2003: Visiting researcher at IMST GmbH, Germany</li><li>◇ Feb. 2001-Nov. 2001: Master thesis internship at Telecom Italia Lab, Turin, Italy</li></ul>

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- HONORS
- ◇ 2017 exemplary reviewer, IEEE Transactions on Wireless Communications
  - ◇ 2016 exemplary reviewer, IEEE Transactions on Communications
  - ◇ 2013 IEEE ComSoc Young Researcher Award for Europe, Middle East, and Africa Region
  - ◇ 2013 IEEE Sweden VT-COM-IT Chapter *best student conference paper award* (lead author: Ph.D. student Wei Yang)
  - ◇ *Student paper award* at the IEEE International Symposium on Information Theory (ISIT 2012) (lead author: Ph.D. student Wei Yang)
  - ◇ *Senior member* of the Institute of Electrical and Electronics Engineers (IEEE), Feb. 2012
  - ◇ *Optime* award from Unione Industriale, Turin, Italy (for best graduates of the year 2001)
- TEACHING & SUPERVISION
- ◇ Chalmers University of Technology: **Lecturer**
    - 2020: Statistics and machine learning in high dimensions (7.5 credits, master/PhD course, fall semester, taught in English)
    - 2011–2019: Information theory (7.5 credits, master/PhD course, spring semester, taught in English)
    - 2012–2020: Wireless communications (7.5 credits, master course, spring semester, taught in English, *guest lecturer*)
    - 2016–2018: Probability and random processes (7.5 credits, master/PhD course, fall semester, taught in English)
    - 2014–18: Electrical measurements: systems and methods (7.5 credits, bachelor course, spring semester, taught in English/Swedish)
    - 2011: Network information theory (7.5 credits, PhD course, fall semester, taught in English)
  - ◇ Vienna University of Technology: **Lecturer**
    - 2012: Network information theory (1.5 unit, graduate/PhD short course, spring semester, taught in English)
  - ◇ ETH Zurich: **Teaching assistant** for graduate courses
    - 2007–2010: Fundamentals of wireless communications (4-unit graduate course, spring semester, taught in English)
    - 2009: Receivers for wireless communications (4-unit graduate course, spring semester, taught in English)
    - 2009: Harmonic analysis: theory and applications in advanced signal processing (4-unit graduate course, spring semester, taught in English)
  - ◇ Politecnico di Torino: **Teaching assistant** for undergraduate courses
    - 2005: Analysis of discrete-time signals (2-unit undergraduate course, fall semester, taught in Italian)
    - 2003–2004: Signal theory (2-unit undergraduate course, fall semester, taught in Italian)
  - ◇ Currently supervised Ph.D. students at Chalmers University of Technology:
    - O. Kislal, *Joint coding and queuing analyses in ultra-reliable low-latency communications*, started in 2019 (co-supervisor)
    - F. Hellström, *Mathematics of deep learning*, started in 2018
    - Y. Ettetfagh, *Multiantenna wireless architectures*, started in 2017
    - J. Östman, *Low-latency ultra-reliable communications*, started in 2015, (co-supervisor)
  - ◇ Current post-doctoral fellows at Chalmers University of Technology:
    - A. Lancho, *Massive multiple-access communications for IoT applications*
    - A. Rezazadeh, *Information-theoretic methods in machine learning*

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- ◇ Past post-doctoral fellows at Chalmers University of Technology:
  - G. C. Ferrante, *finite blocklength information theory*, 2017-2018
- ◇ Past Ph.D. students
  - S. Jacobsson, *Massive multiantenna communications with low-resolution converters*, PhD 2019 (main supervisor, Chalmers University of Technology)
  - K. Keykhosravi, *Capacity analysis and receiver design in the presence of fiber nonlinearity*, PhD 2019 (co-supervisor, Chalmers University of Technology)
  - R. Devassy, *Delay and throughput bounds for the design of next generation wireless systems*, PhD 2019 (main supervisor, Chalmers University of Technology)
  - W. Yang, *Fading channels: capacity and channel coding rate in the finite-blocklength regime*, PhD 2015 (main supervisor, Chalmers University of Technology)
  - M. R. Khanzadi, *Phase noise in communication systems: modeling, compensation, and performance analysis*, PhD 2015 (co-supervisor, Chalmers University of Technology)
  - P. Kuppinger, *General uncertainty relations and sparse signal recovery*, PhD 2011 (co-supervisor, ETH Zurich)
  - V. I. Morgenstern, *Crystallization and noncoherence in wireless communication*, PhD 2010 (co-supervisor, ETH Zurich)
  - U. G. Schuster, *Wireless communication over wideband channels*, PhD 2007 (co-supervisor, ETH Zurich)

PROFESSIONAL SERVICE ◇ Editorships:

- Associate editor, IEEE Transactions on Communications, 2015-current
- Publications editor, IEEE Transactions on Information Theory, 2011-2014.
- ◇ Member of the organizing committee:
  - Publication chair, Information Theory Workshop (ITW), Riva del Garda, Italy, September 2020
  - Track chair, Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, California, USA, Nov. 2019
  - Publication editor, International Symposium on Information Theory (ISIT), Aachen, Germany, Jul. 2017
  - Chair, European School of Information Theory (ESIT), Gothenburg, Sweden, May 2016
  - Local organizer, 7th *International Symposium on Turbo Codes & Iterative Information Processing (ISTC)*, Gothenburg, Sweden, Aug. 2012
  - Chair, Workshop on *Machine Learning and Large Data Sets*, Gothenburg, Sweden, Aug. 2011
  - Chair, 1st workshop on *Ultra-Wideband for Wireless Personal Area and Sensor Networks*, Turin, Italy, Nov. 2004
- ◇ Technical program committee membership:

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- *IEEE Int. Conf. Commun. (ICC)*: 2006, 2011–2016, 2018–2020
- *Int. Veh. Tech. Conf (VTC)*: 2017–2019
- *Int. Zurich Seminar (IZS)*: 2014–2020
- *IEEE Global Commun. Conf. (GLOBECOM)*: 2011–2013, 2018
- *Int. Conf. Telecommun. (ICT)*: 2015, 2018
- *Int. Symp. Wirel. Commun. Sys. (ISWCS)*: 2011, 2017, 2018
- *Int. ITG Conf. Sys. Commun. Coding (SCC)*: 2017, 2019
- *IEEE Inf. Theory. Workshop (ITW)*: 2016
- *IEEE Wirel. Commun. Net. Conf. (WCNC)*: 2013–2016, 2019
- *Int. Workshop Physic Wirel. Comm. Net. (PHYSCOMNET)*: 2014
- *Int. Conf. Comput. Net. Commun. (ICNC)*: 2012, 2018
- *Int. Symp. Personal, Indoor, Mobile Radio Commun. (PIMRC)*: 2012
- *IEEE Swedish Commun. Tech. Workshop (SWE-CTW)*: 2011, 2012
- *Int. Conf. on Commun. Net. in China (CHINACOM)*: 2010
- *IEEE Int. Conf. Ultra-Wideband (ICUWB)*: 2009
- ◇ Referee for the European Research Council (ERC)
- ◇ Referee for the Swedish Research Council (Vetenskapsrådet)
- ◇ Referee for the Italian agency for the evaluation of universities and research institutes (AN-VUR)
- ◇ Referee for the German Verband der Elektrotechnik Elektronik Informationstechnik (VDE-ITG)
- ◇ Referee for the Austrian Wiener Wissenschaft- Forschungs- und Technologiesfonds (WWTF)
- ◇ Member of examination committee/opponent in research degree examinations
  - Manos Fountoulakis, *Performance Analysis and Optimization for Time Critical Networking*, Licentiate Thesis, Linköping University, Oct. 2019
  - Jun Li, *Ultra-low latency communication for 5G transport network*, PhD Thesis, Royal Institute of Technology, Sweden, Sep. 2019.
  - Sebastian Schiessl, *Performance Trade-offs for Ultra-Reliable Low-Latency Communication Systems*, PhD Thesis, Royal Institute of Technology, Sweden, Jun. 2019.
  - Silvio Mandelli, *Analysis of Wiener phase noise issues in optical transmission systems*, PhD Thesis, Politecnico di Milano, Italy, Jan. 2016.
  - Simone Pecorino, *Information rates of channels with memory by Bayesian tracking*, PhD Thesis, Politecnico di Milano, Italy, Jan. 2016.
  - Zhao Wang, *Interference Alignment with Imperfect Channel Knowledge and Secrecy Constraints*, PhD Thesis, Royal Institute of Technology, Sweden, May 2015.
  - Günther Koliander, *Information-theoretic analysis of noncoherent block-fading channels and singular random variables*, PhD Thesis, Vienna University of Technology, Vienna, Austria, Apr. 2015
  - Hien Quoc Ngo, *Massive MIMO: fundamentals and system designs*, PhD Thesis, Linköping University, Sweden, Mar. 2015
  - David Gustafsson, *Extending the bandwidth of the Doherty power amplifier*, PhD thesis, Chalmers University of Technology, Sweden, Sep. 2014
  - Nicolas Schrammar, *On deterministic models for Gaussian networks*, PhD thesis, KTH Royal Institute of Technology, Sweden, Jun. 2013
  - Hien Quoc Ngo, *Performance bounds for very large multiuser MIMO systems*, Licentiate thesis, Linköping University, Sweden, Dec. 2012

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- Lu Lu, *Wireless broadcasting with network coding*, Licentiate thesis, KTH Royal Institute of Technology, Sweden, Sep. 2011
- P. Kuppinger, *General uncertainty relations and sparse signal recovery*, PhD thesis, ETH Zurich, Switzerland Feb. 2011

FUNDING

- ◇ “Information-theoretic limits for deep neural networks”, Marie Skłodowska-Curie Individual Fellowship 2020-2021, responsibility: **supervisor** (fellow: A. Rezazadeh)
- ◇ “Generalization bounds for deep neural networks: Insight and Design” Wallenberg AI, autonomous system, and software program, 2020-2025, **co-investigator**
- ◇ “Non-coherent low-latency communications”, German DAAD-DLR fellowship, 25 kSEK, 2019, responsibility: **principal investigator**
- ◇ “Distributed massive MIMO with low-precision components”, Swedish Foundation for Strategic Research (SSF), Industrial PhD grant, 2 500 kSEK, 2020-2024, responsibility: **principal investigator**
- ◇ “Secure, Private, and Low-Latency Cloud Connectivity for IoT Applications”, WASP expedition project, 2019-2021, responsibility: **principal investigator**
- ◇ “Communication in time: theory and practice for the automated society”, Swedish Research Council, *2018-04359 project grant* 2019-2022, 4 000 kSEK, responsibility: **co-investigator**
- ◇ “Low-Latency Wireless Random Access for IoT connectivity”, Swedish Foundation for Strategic Research (SSF), Mobility Grant, 933 kSEK, 2018-2019, responsibility: **principal investigator**
- ◇ “Protection in a Power-Electronic Converter Dominated Medium-Voltage Microgrid Utilizing Digital Communication”, Chalmers Energy Area of Advance, 2MSEK, 2018-2019, responsibility: **co-investigator**
- ◇ “Wireless communication for stability and performance enhancement in converter-dominated AC microgrids”, Chalmers E2 seed fund, 250 kSEK, 2018, responsibility: **co-investigator**
- ◇ “INNER–information theory of deep neural networks”, Chalmers E2 seed fund, 500 kSEK, 2018, responsibility: **principal investigator**
- ◇ “SWIFT–short-packet wireless information theory”, Swedish Research Council, *2016-03293 project grant* 2017-2020, 3 680 kSEK **principal investigator**
- ◇ “mmMAGIC–Millimetre-Wave Based Mobile Radio Access Network for Fifth Generation Integrated Communications”, European Commission, Horizon 2020, 2015-2017, responsibility: **project member**
- ◇ “Massive MIMO systems with low-precision converters”, Swedish Foundation for Strategic Research (SSF), Industrial PhD grant, 2 500 kSEK, 2015-2019, responsibility: **principal investigator**
- ◇ “Theory and practice for optimum spectral efficiency for ad-hoc wireless networks with strict requirements on latency and reliability”, Swedish Research Council, *2014-6066 project grant* 2015-2018, 3 643 kSEK **co-investigator**
- ◇ “Multi-antenna technologies for wireless access and backhaul (MATWAB)”, VINNOVA, 3570 kSEK, 2015-2016; responsibility: **co-investigator and project manager**
- ◇ “Massive MIMO: from hype to roll-out”, Ericsson AB, 4000 kSEK, 2014-2016, **co-investigator**
- ◇ “Nonlinear hardware impairments in massive MIMO systems”, Swedish Foundation for Strategic Research (SSF), Strategic Mobility Grant, 942 kSEK, 2014-2015, responsibility: **principal investigator**
- ◇ “Optical interference is not noise”, Swedish Research Council, *2013-5271 project grant*, 4 720 kSEK, 2014-2017; responsibility: **co-investigator**

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- ◇ “Multipath test environment for future communication systems” Swedish Research Council, *2013-5718 industrial Ph.D. project grant*, 2 156 kSEK, 2014-2017; responsibility: **co-investigator**
- ◇ “Fundamental limits of user cooperation in wireless networks”, Swedish Research Council, *2012-4571 Junior researcher grant*, 3 280 kSEK; 2013-2016; responsibility: **principal investigator**
- ◇ “Handling the data flood in wireless communications”, Chalmers *Area of Advance* initiative: Information and Communication Technology; 8 000 kSEK; 2010-2014; responsibility: **principal investigator**

## Giuseppe Durisi: Curriculum Vitae

**PUBLICATIONS: OVERVIEW** Since 2001, Dr. Durisi has published a book, 40 journal papers, and 83 conference papers. These papers received 3969 citations according to [Google Scholar](#), with a corresponding *h-index* of 30. The publications are listed below in reversed chronological order.

### PREPRINTS

- [P4] O. Castañeda, S. Jacobsson, G. Durisi, T. Goldstein, and C. Studer, “High-bandwidth spatial equalization for mmWave massive MU-MIMO with processing-in-memory,” Jan. 2020.
- [P3] O. Castañeda, S. Jacobsson, G. Durisi, T. Goldstein, and C. Studer, “Finite-alphabet MMSE equalization for all-digital massive MU-MIMO mmWave communications,” Sep. 2019.
- [P2] J. Östman, R. Devassy, G. Durisi, and E. G. Ström, “Short-packet Transmission via Variable-Length Codes in the Presence of Noisy Stop Feedback,” Sep. 2019. [Online]. Available: <http://arxiv.org/abs/1909.01049>
- [P1] A. Lancho, J. Ostman, G. Durisi, T. Koch, and G. Vazquez-Vilar, “Saddlepoint Approximations for Short-Packet Wireless Communications,” Sep. 2019. [Online]. Available: <http://arxiv.org/abs/1904.10442>

### PUBLICATIONS: BOOKS

- [B1] A. Zaidi, F. Athley, J. Medbo, U. Gustavsson, G. Durisi, and X. Cheng, *5G Physical Layer: principles, models and technology components*. Academic Press, 2018.

### PUBLICATIONS: BOOK CHAPTERS

- [BC1] G. Durisi, U. G. Schuster, V. I. Morgenshtern, H. Bölcskei, and S. Shamai (Shitz), “Information theory of underspread WSSUS channels,” in *Wireless Communications over Rapidly Time-Varying Channels*, F. Hlawatsch and G. Matz, Eds. Academic Press, Mar. 2011.

### PUBLICATIONS: JOURNAL PAPERS

- [J40] A. Lancho, T. Koch, and G. Durisi, “On single-antenna Rayleigh block-fading channels at finite blocklength,” *IEEE Trans. Inf. Theory*, vol. 66, no. 1, pp. 496–519, Jan. 2020.
- [J39] K. Keykhosravi, E. Agrell, and G. Durisi, “Accuracy assessment of nondispersive optical perturbative models through capacity analysis,” *Entropy*, vol. 21, no. 8, Aug. 2019.
- [J38] K. Keykhosravi, M. Secondini, G. Durisi, and E. Agrell, “How to increase the achievable information rate by per-channel dispersion compensation,” *J. Lightw. Technol.*, 2019.
- [J37] M. C. Coşkun, G. Durisi, T. Jerkovits, G. Liva, W. Ryan, B. Stein, and F. Steiner, “Efficient error-correcting codes in the short blocklength regime,” *Physical Communication*, Mar. 2019.
- [J36] R. Devassy, G. Durisi, G. C. Ferrante, O. Simeone, and E. Uysal-Biyikoglu, “Reliable transmission of short packets through queues and noisy channels under latency and peak-age violation guarantees,” *IEEE J. Sel. Areas Commun.*, vol. 37, no. 4, pp. 721–734, Apr. 2019.
- [J35] S. Jacobsson, G. Durisi, M. Coldrey, and C. Studer, “Linear precoding with low-resolution DACs for massive MU-MIMO-OFDM downlink,” *IEEE Trans. Wireless Commun.*, vol. 18, no. 3, pp. 1595–1609, Mar. 2019.
- [J34] J. Östman, G. Durisi, E. G. Ström, M. C. Coşkun, and G. Liva, “Short packets over block-memoryless fading channels: Pilot-assisted or noncoherent transmission?” *IEEE Trans. Commun.*, vol. 67, no. 2, pp. 1521–1536, Feb. 2019.
- [J33] P. Popovski, K. F. Trillingsgaard, O. Simeone, and G. Durisi, “5G wireless network slicing for eMBB, URLLC, and mMTC: A communication-theoretic view,” *IEEE ACCESS*, vol. 6, no. 1, Dec. 2018.

- [J32] K. F. Trillingsgaard, W. Yang, G. Durisi, and P. Popovski, “Variable-length coding with stop-feedback for the common-message broadcast channel in the nonasymptotic regime: stop feedback,” *IEEE Trans. Inf. Theory*, vol. 64, no. 12, pp. 7686–7718, Dec. 2018.
- [J31] K. F. Trillingsgaard, W. Yang, G. Durisi, and P. Popovski, “Common-message broadcast channels with feedback in the nonasymptotic regime: Full feedback,” *IEEE Trans. Inf. Theory*, vol. 64, no. 12, pp. 7719–7741, Dec. 2018.
- [J30] W. Yang, A. Collins, G. Durisi, Y. Polyanskiy, and H. V. Poor, “Beta-beta bounds: Finite-blocklength analog of the golden formula,” *IEEE Trans. Inf. Theory*, vol. 64, no. 9, pp. 6236–6256, Sep. 2018.
- [J29] K. Keykhosravi, M. Tavana, E. Agrell, and G. Durisi, “Demodulation and detection schemes for a memoryless optical WDM channel,” *IEEE Trans. Commun.*, vol. 66, no. 7, pp. 2994–3005, Jul. 2018.
- [J28] O. Castañeda, S. Jacobsson, G. Durisi, M. Coldrey, T. Goldstein, and C. Studer, “1-bit massive MU-MIMO precoding in VLSI,” *IEEE Trans. Emerg. Sel. Topics Circuits Syst.*, vol. 7, no. 4, pp. 508–522, Dec. 2017.
- [J27] S. Jacobsson, G. Durisi, M. Coldrey, T. Goldstein, and C. Studer, “Quantized precoding for massive MU-MIMO,” *IEEE Trans. Commun.*, vol. 65, no. 11, pp. 4670–4684, Nov. 2017.
- [J26] S. Jacobsson, G. Durisi, M. Coldrey, U. Gustavsson, and C. Studer, “Throughput analysis of massive MIMO uplink with low-resolution ADCs,” *IEEE Trans. Wireless Commun.*, vol. 16, no. 6, pp. 4038–4051, Jun. 2017.
- [J25] J. Scarlett, V. Y. F. Tan, and G. Durisi, “The dispersion of nearest-neighbor decoding for additive non-Gaussian channels,” *IEEE Trans. Inf. Theory*, vol. 63, no. 1, pp. 81–92, Jan. 2017.
- [J24] W. Yang, G. Durisi, and Y. Polyanskiy, “Minimum energy to send  $k$  bits over multiple-antenna fading channels,” *IEEE Trans. Inf. Theory*, vol. 62, no. 12, pp. 6831 – 6853, Dec. 2016.
- [J23] C. Studer and G. Durisi, “Quantized massive MU-MIMO-OFDM uplink,” *IEEE Trans. Commun.*, vol. 64, no. 6, pp. 2387–2399, Jun. 2016.
- [J22] G. Durisi, T. Koch, and P. Popovski, “Towards massive, ultra-reliable, and low-latency wireless communication with short packets,” *Proc. IEEE*, vol. 104, no. 9, pp. 1711–1726, Sep. 2016.
- [J21] G. Durisi, T. Koch, J. Östman, Y. Polyanskiy, and W. Yang, “Short-packet communications over multiple-antenna Rayleigh-fading channels,” *IEEE Trans. Commun.*, vol. 64, no. 2, pp. 618–629, Feb. 2016.
- [J20] R. Devassy, G. Durisi, J. Östman, W. Yang, T. Eftimov, and Z. Utkovski, “Finite-SNR bounds on the sum-rate capacity of Rayleigh block-fading multiple-access channels with no a priori CSI,” *IEEE Trans. Commun.*, vol. 63, no. 10, pp. 3621–3632, Oct. 2015.
- [J19] W. Yang, G. Caire, G. Durisi, and Y. Polyanskiy, “Optimum power control at finite blocklength,” *IEEE Trans. Inf. Theory*, vol. 61, no. 9, pp. 4598–4615, Sep. 2015.
- [J18] M. R. Khanzadi, G. Durisi, and T. Eriksson, “Capacity of SIMO and MISO phase-noise channels with common/separate oscillators,” *IEEE Trans. Commun.*, vol. 63, no. 9, pp. 3218 – 3231, Sep. 2015.
- [J17] G. Koliander, E. Riegler, G. Durisi, and F. Hlawatsch, “Degrees of freedom of generic block-fading MIMO channels without a priori channel state information,” *IEEE Trans. Inf. Theory*, vol. 60, no. 12, pp. 7760–7781, Dec. 2014.
- [J16] M. Dörpinghaus, G. Koliander, G. Durisi, E. Riegler, and H. Meyr, “Oversampling increases the pre-log of noncoherent Rayleigh fading channels,” *IEEE Trans. Inf. Theory*, vol. 60, no. 9, pp. 5673–5681, Sep. 2014.



- [J15] E. Agrell, A. Alvarado, G. Durisi, and M. Karlsson, “Capacity of a nonlinear optical channel with finite memory,” *J. Lightw. Technol.*, vol. 32, no. 16, pp. 2862–2876, Aug. 2014, **invited paper**.
- [J14] W. Yang, G. Durisi, T. Koch, and Y. Polyanskiy, “Quasi-static multiple-antenna fading channels at finite blocklength,” *IEEE Trans. Inf. Theory*, vol. 60, no. 7, pp. 4232–4265, Jul. 2014.
- [J13] G. Durisi, A. Tarable, C. Camarda, R. Devassy, and G. Montorsi, “Capacity bounds for MIMO microwave backhaul links affected by phase noise,” *IEEE Trans. Commun.*, vol. 62, no. 3, pp. 920–929, Mar. 2014.
- [J12] V. I. Morgenshtern, E. Riegler, W. Yang, G. Durisi, S. Lin, B. Sturmfels, and H. Bölcskei, “Capacity pre-log of noncoherent SIMO channels via Hironaka’s theorem,” *IEEE Trans. Inf. Theory*, vol. 59, no. 7, pp. 4213–4229, Jul. 2013.
- [J11] W. Yang, G. Durisi, and E. Riegler, “On the capacity of large-MIMO block-fading channels,” *IEEE J. Sel. Areas Commun.*, vol. 31, no. 2, pp. 117–132, Feb. 2013.
- [J10] G. Durisi, V. I. Morgenshtern, and H. Bölcskei, “On the sensitivity of continuous-time noncoherent fading channel capacity,” *IEEE Trans. Inf. Theory*, vol. 58, no. 10, pp. 6372–6391, Oct. 2012.
- [J9] G. Durisi, “On the capacity of the block-memoryless phase-noise channel,” *IEEE Commun. Lett.*, vol. 16, no. 8, pp. 1157–1160, Aug. 2012.
- [J8] P. Kuppinger, G. Durisi, and H. Bölcskei, “Uncertainty relations and sparse signal recovery for pairs of general signal sets,” *IEEE Trans. Inf. Theory*, vol. 58, no. 1, pp. 263–277 Jan. 2012.
- [J7] G. Durisi and H. Bölcskei, “High-SNR capacity of wireless communication channels in the noncoherent setting: A primer,” *Int. J. Electron. Commun. (AEÜ)*, vol. 65, no. 8, pp. 707–712, Aug. 2011, **invited paper**.
- [J6] G. Durisi, U. G. Schuster, H. Bölcskei, and S. Shamai (Shitz), “Noncoherent capacity of underspread fading channels,” *IEEE Trans. Inf. Theory*, vol. 56, no. 1, pp. 367–395, Jan. 2010.
- [J5] U. G. Schuster, G. Durisi, H. Bölcskei, and H. V. Poor, “Capacity bounds for peak-constrained multiantenna wideband channels,” *IEEE Trans. Commun.*, vol. 57, no. 9, pp. 2686–2696, Sep. 2009.
- [J4] M. R. Casu and G. Durisi, “Implementation aspects of a transmitted-reference UWB receiver,” *Wirel. Commun. Mob. Comput., Special Issue: Ultrawideband for Wireless Communications*, vol. 5, no. 5, pp. 537–549, Aug. 2005.
- [J3] G. Durisi and S. Benedetto, “Comparison between coherent and noncoherent receivers for UWB communications,” *EURASIP J. Signal Process., Special Issue: UWB—State of the Art*, no. 3, Mar. 2005.
- [J2] G. Durisi, A. Tarable, J. Romme, and S. Benedetto, “A general method for error probability computation of UWB systems for indoor multiuser communications,” *J. Commun. Netw., Special Issue: Ultra-Wideband (UWB) Communications*, vol. 5, no. 4, pp. 354–364, Dec. 2003.
- [J1] G. Durisi and S. Benedetto, “Performance evaluation of TH-PPM in the presence of multiuser interference,” *IEEE Commun. Lett.*, vol. 7, no. 5, May 2003.

PUBLICATIONS:  
CONFERENCE  
PAPERS

- [C83] O. Castañeda, S. Jacobsson, G. Durisi, T. Goldstein, and C. Studer, “Soft-output finite alphabet equalization for mm-wave massive MIMO,” in *Proc. IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP)*, Barcelona, Spain, May 2020.

- [C82] O. Castañeda, S. Jacobsson, G. Durisi, T. Goldstein, and C. Studer, “High-bandwidth spatial equalization for mmWave massive MU-MIMO with processing-in-memory,” in *Proc. IEEE Int. Symp. Circuits and Syst. (ISCAS)*, Seville, Spain, May 2020.
- [C81] S. Jacobsson, L. Aabel, M. Coldrey, I. C. Sezgin, C. Fager, G. Durisi, and C. Studer, “Massive MU-MIMO-OFDM Uplink with Direct RF-Sampling and 1-Bit ADCs,” in *Proc. IEEE Global Telecommun. Conf. (GLOBECOM)*, Waikoloa, HI, USA, Dec. 2019.
- [C80] J. Östman, A. Lancho, and G. Durisi, “Short-packet transmission over a bidirectional massive MIMO link,” in *Proc. Asilomar Conf. Signals, Syst., Comput.*, Pacific Grove CA, U.S.A., Nov. 2019.
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## Giuseppe Durisi: Curriculum Vitae

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- [C1] G. Durisi, G. Romano, “On the validity of Gaussian approximation to characterize the multiuser capacity of UWB TH PPM,” in *IEEE Conf. Ultra Wideband Syst. Technol. (UWBST) Dig. Tech. Papers*, Baltimore, MD, U.S.A., May 2002, pp. 157–161.

### PATENTS

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- [PA1] S. Jacobsson, A. Nilsson, M. Coldrey, G. Durisi, “Joint Scheduling and Power Allocation in Coarsely Quantized Massive MU-MIMO”, Application Number PCT/EP2018/066414, under review

### SOFTWARE

- [S2] SPECTRE: short-packet communication toolbox. [Online]. Available: <https://github.com/yp-mit/spectre>
- [S1] Quantized precoding for massive MIMO. [Online]. Available: <https://github.com/quantizedmassivemimo/>

### TUTORIAL

- [T2] Giuseppe Durisi and Fabian Steiner “Short-packet communications: fundamentals and practical coding schemes”, Swedish Communicaton Technology Workshop (SWE-CTW), Lund, Sweden, Jun. 2019.
- [T1] Giuseppe Durisi, Gianluigi Liva, and Fabian Steiner, “Short-packet communications: fundamentals and practical coding schemes”, IEEE Globecom 2018, Abu-Dhabi, UAE.

### INVITED TALKS

- [I28] “Playing with bits”, Lunch talks at Ericsson Series, Gothenburg, Sweden, Sep. 2019.
- [I27] “Fundamentals of short-packet transmission”, Plenary talk at the Small-Data Networks Special Session, Int. Symp. Personal, Indoor and Mobile Radio Commun., Bologna, Italy, Sep. 2018
- [I26] “Delay and peak-age violation probability in short-packet transmissions”, Communication Theory Workshop (CTW), Miramar Beach, Florida, May 2018
- [I25] “Short-packet over fading channels: pilot-assisted or noncoherent transmission?”, NSF Workshop on Low-Latency Wireless Random-Access, MIT, Cambridge, MA, USA, Nov. 2017
- [I24] “Short-packet transmission”, tutorial presentation at “ITG-Fachgruppe”: applied information theory, Bremen, Germany, Oct. 2017
- [I23] “Quantized precoding for massive MU-MIMO”, Ericcson, Stockholm, Sweden, Nov. 2016
- [I22] “Latency-reliability trade-off in short packet communications”, Communication Theory Workshop (CTW), Nafplio, Greece, May 2016
- [I21] “My path through information theory: From double asymptotics to finite blocklength”, Claude Elwood Shannon 100th Birthday Celebration, Paderborn, Germany, May 2016
- [I20] “How much energy is needed to transmit  $k$  bits over fading channels?”, Technische Universität München (TUM), Dec. 2015

- [I19] “Towards low-latency wireless communications: the art of sending short packets”, GRD ISIS workshop on recent advances in network information theory and coding theory, Lyon, Nov. 2015
- [I18] “Short packet communications with multiple antennas”, Vienna University of Technology, Apr. 2015
- [I17] “Short packet communications with multiple antennas”, Nordic Workshop on System & Network Optimization for Wireless, Geilo, Norway, Mar. 2015
- [I16] “Short packet communications with multiple antennas”, Linköping University, Sweden, Mar. 2015
- [I15] “Short packet communications with multiple antennas”, Inf. Theory Applicat. Workshop (ITA), San Diego, CA, Feb. 2015
- [I14] “Massive MIMO uplink with 1 bit ADC”, Ericsson AB, Stockholm, Sweden, Nov., 2014
- [I13] “On the cost of CSI acquisition in large MIMO systems”, Communication Theory Workshop, Phuket, Thailand, Jun., 2013
- [I12] “How costly is it to learn fading channels?”, Linköping University, Sweden, Dec., 2012
- [I11] “How costly is it to learn fading channels?”, RWTH Aachen, Germany, Jul., 2012
- [I10] “How costly is it to learn fading channels?”, Vienna University of Technology, Apr. 2012
- [I9] “MIMO for microwave backhaul links: research challenges”, Ericsson AB, Gothenburg, Sweden, Mar. 2012
- [I8] “How costly is it to learn a MIMO fading channel?”, Ericsson research, Gothenburg, Sweden, Mar. 2012
- [I7] “Degrees of freedom of multiple-antenna systems under channel uncertainty”, Politecnico di Torino, Turin, Italy, Sep. 2011
- [I6] “Degrees of freedom of multiple-antenna systems under channel uncertainty”, KTH Royal Institute of Technology, Stockholm, Sweden, Sep. 2011
- [I5] “Compressed sensing and beyond”, Gothenburg University, Sweden, Aug. 2011
- [I4] “Handling the data flood in wireless communications”, Chalmers University of Technology, Gothenburg, Sweden, May 2010.
- [I3] “On the noncoherent capacity of wireless channels of practical interest”, Joint UMIC and ISS seminar, RWTH Aachen, Germany, Jun. 2009.
- [I2] “On the capacity of real-world fading channels”, ITG meeting—Algorithms for signal processing, Zurich, Switzerland, Mar. 2009.
- [I1] “Capacity bounds for peak-constrained multiantenna channels,” in *Third IEEE Workshop on Advanced Signal Processing for Wireless Communication Systems*, Copenhagen, Denmark, Nov. 2007.