

# CURRICULUM VITAE

Dr. EMIL BJÖRNSSON

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KTH Royal Institute of Technology  
School of Electrical Engineering and Computer Science (EECS)  
Division of Communication Systems, Electrum 229  
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## EDUCATION

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### **Doctor of Philosophy in Telecommunications**

Feb 2007 – Dec 2011

*KTH Royal Institute of Technology, Stockholm, Sweden.*

Thesis title: *Multiantenna Cellular Communications: Channel Estimation, Feedback, and Resource Allocation.*

Research topics: Multi-antenna cellular communications, multi-user resource allocation with limited channel information, estimation theory, stochastic signal processing, and mathematical optimization.

Supervisors: Björn Ottersten (main) and Mats Bengtsson (assisting).

### **Master of Science in Engineering Mathematics**

Sep 2002 – Jan 2007

*Lund University, Lund, Sweden.*

Program in pure and applied mathematics with specialization in signals, images, and systems.

Average grade: 4.9 out of 5.0. I had extra course credits corresponding to one extra year of studies.

Thesis title: *Beamforming Utilizing Channel Norm Feedback in Multiuser MIMO Systems.*

## ACADEMIC POSITIONS

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### **Visiting Professor, Communication Systems**

Sep 2020 – Present

*KTH Royal Institute of Technology, Stockholm, Sweden.*

I am employed as a Visiting Professor (called *gästprofessor* in Swedish) at the KTH Royal Institute of Technology. I work at the Division of Communication Systems of the School of Electrical Engineering and Computer Science (EECS) and I am based at campus in Kista, Stockholm.

### **Associate Professor, Communication Systems**

Dec 2017 – Present

*Linköping University, Linköping, Sweden.*

I am employed as Associate Professor (called *biträdande professor* in Swedish) at Linköping University. I work in the Division of Communication Systems at the Department of Electrical Engineering (ISY). From Sept 2020, I am on part-time leave from this position.

### **Senior Lecturer, Communication Systems**

Jan 2016 – Nov 2017

*Linköping University, Linköping, Sweden.*

I was employed as Senior Lecturer, which is an associate professor position with tenure (called *universitetslektor* in Swedish) at Linköping University. I worked at the Department of Electrical Engineering (ISY) with research, undergraduate teaching, and supervision of doctoral students.

### **Research Fellow, Communication Systems**

Jan 2014 – Dec 2015

*Linköping University, Linköping, Sweden.*

I was employed as Research Fellow, which is an assistant professor position (called *biträdande universitetslektor* in Swedish) in the tenure-track at Linköping University. I worked at the Department of Electrical Engineering (ISY) with research, undergraduate teaching, and supervision of doctoral students.

### **Post-Doc, Alcatel-Lucent Chair on Flexible Radio**

Sep 2012 – July 2014

*Ecole supérieure d'électricité (SUPELEC), Gif-sur-Yvette, France.*

I conducted postdoctoral research within the topic “Optimization of Green Small-Cell Telecommunication Networks”. I was sponsored by an International Postdoc Grant that I received from the Swedish Research Council (Vetenskapsrådet). Main hosts at SUPELEC: Mérouane Debbah and Marios Kountouris.

### **Post-Doc, Signal Processing Lab, School of Electrical Engineering**

Dec 2011 – July 2014

*KTH Royal Institute of Technology, Stockholm, Sweden.*

The first part (until Sep. 2012) consisted of independent research on “Optimal Resource Allocation in Coordinated Multi-Cell Systems” and resulted in a scientific book with that title. During the second part (Sep. 2012 to July 2014), KTH served as my Swedish “home university” for the international postdoc grant “Optimization of Green Small-Cell Telecommunication Networks” from the Swedish Research Council (Vetenskapsrådet). The postdoc research was conducted at SUPELEC, France.

## **EDUCATIONAL EXPERIENCE**

### **Docent Title**

I received the Docent title from Linköping University in Feb. 2015. This is the second highest grade in the Swedish academic system, and the docent title is required to be main supervisor of doctoral students.

### **Courses in Teaching**

- “*Research supervision – Advanced Course in Higher Education Pedagogy*” (4 credits), Linköping University.
- “*Basic Communication and Teaching*” (3 credits) and “*Learning and Teaching*” (7.5 credits), KTH.

### **Teaching Experience**

I am currently course director, examiner, and lecturer in the following courses at Linköping University:

- *TSKS14 Multiple Antenna Communications* (2017-), Master level.
- *Multiple Antenna Communications* (2018-2020), PhD level, course director, lecturer.

I have previously been involved in the following courses:

- *TSRT04 Introduction in Matlab* (2014-2017, 2020), Bachelor level.
- *Classical MIMO Communication* (2020), PhD level.
- *TSKS01 Digital Communication* (2015-2019), Master level.
- *Advanced Topics in Detection and Estimation Theory* (2018), PhD level, lecturer for one half of the course.

- *Multuser MIMO and Spatial Resource Allocation* (2017), PhD level, course director, lecturer.
- *TSKS04 Digital Communication Continuation Course* (2015–2016), Master level, course director, lecturer.
- *Fundamentals of Massive MIMO* (2016), PhD level, lecturer.
- *TSKS02 Telecommunication* (2014), Bachelor level, course director, lecturer.
- *Matrix Algebra* (2012), PhD level, lecturer.
- *Signal Theory* and *Signals and Systems II* (2007–2010), Master and Bachelor level, teaching assistant.
- *Signals and Communications* (2006), Bachelor level, teaching assistant and course development.
- *Calculus in One Variable*, *Calculus in Several Variables*, *Linear Algebra*, and *Computational methods* (2003–2006), Bachelor level, teaching assistant and exam correction.

I have supervised and acted as examiner on several Master's degree projects:

- 2015–2018: Examiner of five Master's degree projects, Linköping University.
- 2008–2009: Supervisor for two Master's degree projects, KTH.

## Research Supervision

I am currently main supervisor of five doctoral students:

- Amin Ghazanfari, Linköping University, since July 2017. (Licentiate degree in October 2019.)
- Özdogan Özgecan, Linköping University, since August 2017. (Licentiate degree in March 2020.)
- Anders Enqvist, KTH Royal Institute of Technology, since January 2021.
- Mahmoud Zaher, KTH Royal Institute of Technology, since January 2021.
- Yasaman Khorsandmanesh, KTH Royal Institute of Technology, since March 2021.

I am currently assistant supervisor of three doctoral students:

- Ozan Alp Topal, KTH Royal Institute of Technology, since February 2021.
- Ema Becirovic, Linköping University, since August 2017.
- Unnikrishnan Kunnath Ganesan, Linköping University, June 2019.
- Zakir Hussain Shaik, Linköping University, August 2019.

I have previously been the main supervisor of:

- Dr. Trinh Van Chien, graduated in January 2020 at Linköping University.
- Dr. Daniel Verenzuela, graduated in February 2020 at Linköping University.

I have previously been an assistant supervisor of:

- Dr. Marcus Karlsson, graduated in September 2018 at Linköping University.
- Dr. Hei Victor Cheng, graduated in April 2018 at Linköping University.
- Dr. Antonios Pitarokoilis, graduated in June 2016 at Linköping University.
- Dr. Axel Müller, graduated in November 2014 at SUPELEC.

I have acted as advisor for the following postdocs at Linköping University:

- Salil Kashyap, 2014–2016.
- Julia Vinogradova, 2015–2016.
- Tan Tai Do, 2016.
- Zheng Chen, 2017–2019.
- Kamil Senel, 2017–2019.
- Özlem Tuğfe Demir, 2019–2022.
- Sucharita Chakraborty, 2019–2020.

## Teaching Material

- Özlem Tuğfe Demir, Emil Björnson, Luca Sanguinetti, “*Foundations of User-Centric Cell-Free Massive MIMO*” (310 pages), published in the book series Foundations and Trends® in Signal Processing, 2021. This book is suitable as course material for doctoral students.
- Emil Björnson, Jakob Hoydis, Luca Sanguinetti, “*Massive MIMO Networks: Spectral, Energy, and Hardware Efficiency*” (517 pages), published in the book series Foundations and Trends® in Signal Processing, 2017.

This book is suitable as course material for graduate and doctoral students. A package with slides and homework problems are offered to teachers.

- Emil Björnson, Eduard Jorswieck, “*Optimal Resource Allocation in Coordinated Multi-Cell Systems*” (270 pages), published in the book series Foundations and Trends® in Communications and Information Theory, 2013. This book is suitable as course material for doctoral students.
- Mikael Olofsson, Emil Björnson, “*Introduction to Digital Communication*” (280 pages), published locally at Linköping University. This book is used in the Master course TSKS01 *Digital Communication*.
- I have produced course material for many three-hour tutorials at international conferences, see the list of tutorial speeches below.

## Leadership in Educational Programmes

From 2016 to 2020, I was the director of the Master’s programme in Communication Systems and the director of the Communication profile for Swedish engineering students at Linköping University. I have taken part in implementing a major modernization of the course curriculum.

# SCIENTIFIC EXPERIENCE

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## Research Grants as Principal Investigator

- *Apr 2020 – Mar 2025*: I have received a Future Researcher Leader Grant from the Swedish Foundation for Strategic Research (SSF) for the project “*Intelligent wireless networks with innovative MIMO topology*”.
- *Jan 2021 – Dec 2025*: I have become a Wallenberg Academy Fellow with the project “*Impairment-aware Signal Detection (ISIDE)*”.
- *Dec 2019 – Nov 2023*: I have received funding from the Swedish Research Council (VR) for the project “*The Next Leap in Wireless Spectral Efficiency: Exploiting Spatial Correlation and Distributed Antenna Surfaces*”.
- *Apr 2019 – Mar 2021*: I have received funding from the Wallenberg AI, Autonomous Systems and Software Program (WASP) for the project “*ICARUS—Intelligent Cell-free Access for wiReless Ubiquitous Services*”.
- *Jan 2016 – Dec 2019*: I have received funding from the Swedish Research Council (VR) for the project “*Optimized Design of Wireless Networks with Multiple Performance Metrics*”.
- *Sept 2015 – Aug 2018*: I have received a 2015 Ingvar Carlsson Award from the Swedish Foundation for Strategic Research (SSF) for the project “*Holistic energy efficiency optimization in cellular networks*”.
- *Jan 2015 – Dec 2020*: I have received funding from CENIIT for the project “*Radio Resource Management in Massive MIMO Communication Systems*”.
- *Sept 2012 – July 2014*: I was one of the first recipients of the International Postdoc Grant from the Swedish Research Council (VR). This grant funded a 2-year postdoc position at SUPELEC, France.

## Research Grants as Co-Applicant

- *Jan 2021 – June 2024*: I was a co-applicant of the project “*REsilient INteractive applications through hyper Diversity in Energy Efficient RadioWeaves technology (REINDEER)*” which was funded by the European Union’s Horizon 2020 research and innovation programme under grant agreement No. 101013425. The project is coordinated by Technikon and the other partners are KU Leuven, Linköping University, Lund University, Telefonica, Ericsson, TU Graz, BlooLoc, and NXP Semiconductors.
- *Aug 2019 – July 2021*: I was a co-applicant of the project “*Array antennas for SatCom applications on mobile platforms*” which was funded by VINNOVA within the strategic innovation program Smarter Electronic Systems. The project is coordinated by ReQuTech AB and the other partners are Forsway Scandinavia AB and Linköping University.

## Inventions

I'm a co-inventor of 8 granted US patent applications related to multi-antenna communication technology:

[P8] Pål Frenger, Emil Björnson, Martin Hessler, Erik G Larsson, “*First communication device and methods performed thereby for transmitting radio signals using beamforming to a second communication device,*” US patent 10,771,125. Granted: Sep. 8, 2020.

[P7] Martin Hessler, Emil Björnson, Erik G Larsson, Reza Moosavi, “*Reporting of radio channel quality,*” US patent 10,715,225. Granted: Jul. 14, 2020.

[P6] Pål Frenger, Emil Björnson, Martin Hessler, Erik G Larsson, “*Discriminating between communication apparatuses based on their transmitted power,*” US patent 10,715,225. Granted: May 15, 2020.

[P5] Pål Frenger, Emil Björnson, Martin Hessler, Giovanni Interdonato, Erik Larsson, “*Method of assigning transmission timing to radio terminal, radio network node and radio terminal,*” US patent 10,568,056. Granted: Feb. 18, 2020.

[P4] Martin Hessler, Emil Björnson, Erik G Larsson, “*Wireless device, a network node and methods performed thereby for communicating with each other,*” US patent 10,492,150. Granted: Nov. 26, 2019.

[P3] Martin Hessler, Emil Björnson, Hei Victor Cheng, Erik G Larsson, “*Multiple access method in a massive MIMO system,*” US patent 10,461,829. Granted: Oct. 29, 2019.

[P2] Erik G Larsson, Emil Björnson, “*Technique for assigning pilot signals to user equipments,*” US patent 10,425,206. Granted: Sep. 24, 2019.

[P1] Pål Frenger, Emil Björnson, Martin Hessler, Erik G Larsson, “*Data transmission on a contention based physical data channel,*” US patent 10,219,294. Granted: Feb. 26, 2019.

I am a co-inventor of 17 pending patent applications. 1 application was filed in 2020, 7 applications were filed in 2019, 4 applications were filed in 2018, 4 applications were filed in 2017, 7 applications were filed in 2016, and 2 applications were filed in 2015. These inventions were made in collaboration with and acquired by Ericsson.

## Scientific Publications

I have published the following (and additional papers are under review):

- 3 scientific books and 2 book chapters
- 18 peer-reviewed overview articles
- 102 peer-reviewed journal articles
- 138 peer-reviewed conference papers
- 8 US patents

These publications have received 13582 citations, whereof one article has 867 citations and one book has 592 citations. These citations correspond to an *h*-index of 55 (source: [Google Scholar](#), May 1, 2021).

## Open and Reproducible Research

I am an active promoter of reproducibility of research results and of open publishing. I have made simulation code freely and publicly available for more than 30 scientific publications, including my books from 2013, 2017, and 2021. Most of the code is available here: <https://github.com/emilbjornson>

## Editor in International Journals

- I am the Area editor for Social Media and Outreach of the *IEEE Signal Processing Magazine* since 2021.

- I am an Editor in the online editorial team of *IEEE Transactions on Wireless Communications* since 2020.
- I am an Associate editor of *IEEE Transactions on Communications* since 2017.
- I am the Lead guest editor of the special issue on “Reconfigurable Intelligent Surface-Based Communications for 6G Wireless Networks” in the IEEE Open Journal of Communications Society (OJ-COMS), 2020.
- I was an Associate editor of *IEEE Transactions on Green Communications and Networking* 2016-2020. I was an associate editor of the *IEEE Journal on Selected Areas in Communications (JSAC)*, series on *Green Communications and Networking*, 2015-2016.
- I was a Guest editor of the two-part special issue on “Multiple Antenna Technologies for Beyond 5G” in the *IEEE Journal on Selected Areas in Communications*, 2020.
- I was a Guest editor of the special issue on “AI for Mobile Networks”, IEEE Network, 2020.
- I was a Guest editor of the two-part special issue on “Millimeter Wave Communications for Future Mobile Networks” in the *IEEE Journal on Selected Areas in Communications*, 2017.

### **Involvement in International Research Projects**

- I was the work package leader for WP1 in the European project 5Gwireless (H2020 Marie Skłodowska-Curie Innovative Training Networks (ITNs)), 2015-2018.
- I was the task leader for T1.1 and T3.1 in the European project MAMMOET (FP7), 2014-2016.
- Many of my research papers are published within European research projects: METIS (FP7), MORE (ERC), HIATUS (FP7), AMIMOS (ERC), COOPCOM (FP6), and WINNER+ (Celtic).

### **Invited and Tutorial Speeches (selection)**

- Keynote speaker at the International Conference on Advanced Communication Technologies and Networking (CommNet), December 2021.
- Plenary speaker at the IEEE Communications Theory Workshop, June 2021.
- Tutorial speaker at the IEEE International Conference on Communications (ICC), Virtual conference, June 2021.
- Tutorial speaker at the IEEE Vehicular Technology Conference (VTC), Virtual conference, April 2021.
- Keynote speaker at the Disruptive Wireless Communication Paradigms: The Road towards 6G (DWCP-6G), ECE Department, IIT Guwahati, February 2021.
- Tutorial speaker at the IEEE Global Communications Conference (GLOBECOM), Taipei, Taiwan, December 2020.
- Invited speaker at the 5G Italy PhD School, Virtual event, December 2020.
- Tutorial speaker at the IEEE 5G World Forum, Virtual conference, September 2020.
- Tutorial speaker at the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Virtual conference, May 2020.
- Invited speaker at the 6G Wireless Summit, Virtual conference, March 2020.
- Webinar speaker in the IEEE Future Networks Webinar Series, March 2020.
- Invited speaker at the ITG Workshop on Smart Antennas, Hamburg, February 2020.
- Tutorial speaker at the IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP), Guadeloupe, France, December 2019.
- Invited speaker at the 5G Italy PhD School, Rome, Italy, December 2019.
- Keynote speaker at the GTTI Annual Meeting, Pavia, Italy, June 2019.
- Webinar speaker in the IEEE ComSoc Webinar Series, September 2018.
- Webinar speaker in the IEEE ComSoc Webinar Series, June 2018.

- Tutorial speaker at the IEEE Wireless Communications and Networking Conference (WCNC), Barcelona, Spain, April 2018.
- Webinar speaker in the IEEE 5G Webinar Series, January 2018.
- Tutorial speaker at the IEEE Global Communications Conference (GLOBECOM), Singapore, December 2017.
- Invited speaker in the workshop 5G Heterogeneous and Small Cell Networks, IEEE Global Communications Conference (GLOBECOM), Singapore, December 2017.
- Webinar speaker in the IEEE ComSoc Webinar Series, November 2017.
- Lecturer at the 2017 Joint IEEE SPS and EURASIP Summer School on Signal Processing for 5G Wireless Access, May 2017.
- Tutorial speaker at the IEEE Global Communications Conference (GLOBECOM), Washington D.C., USA, December 2016.
- Tutorial speaker at the 5Gwireless Training Event, Dresden, Germany, September 2016.
- Tutorial speaker at the Tyrrhenian International Workshop on Digital Communications, Livorno, Italy, September 2016.
- Tutorial speaker at the IEEE Workshop on Signal Processing Advances in Wireless Communications (SPAWC), Stockholm, Sweden, June 2015.
- Tutorial speaker at the IEEE International Conference on Communications (ICC), London, UK, June 2015.
- Keynote speaker at International Workshop on Computer-Aided Modeling Analysis and Design of Communication Links and Networks (CAMAD), Athens, Greece, December 2014.
- Lecturer at 5GrEEEn Summer School on “Energy Efficient Mobile Networks”, Stockholm, Sweden, August 2014.
- Tutorial speaker at the IEEE International Conference on Communications (ICC), Sydney, Australia, June 2014.
- Keynote speaker at the Workshop on Wireless Evolution Beyond 2020, Istanbul, Turkey, April 2014.
- Lecturer at Newcom# Spring School on “Advanced Signal Processing Techniques for Heterogeneous Networks”, Pisa, Italy, March 2014.
- Invited speaker at Greentouch Open Forum, Paris, France, November 2013.
- Tutorial speaker at the IEEE Symposium on Personal, Indoor, Mobile and Radio Communications (PIMRC), London, UK, September 2013.
- Keynote speaker at the workshop “Signal Processing and Optimization for Wireless Communications: In Memory of Are Hjörungnes”, Trondheim, Norway, May 2013.

### **Social Media Activity**

- I am the founder of the YouTube channel “Wireless Future” with 12000+ subscribers. It publishes videos that about wireless communication, produced by me and my colleagues.
- I am a co-founder and regular writer at the “Wireless Future” blog, <https://ma-mimo.ellintech.se>. This blog has a newsletter with hundreds of members.
- I am a co-founder of the podcast “Wireless Future” which is published both as a video podcast on my YouTube channel and as an audio-only podcast delivered by the most popular podcast apps.
- I am the founder and manager of the LinkedIn group “Massive MIMO and Intelligent Surfaces”, which has 1800+ members. I am using this group and my own LinkedIn network with 4800+ connections to spread information related to the research by myself and others.
- I am managing a Facebook group on “LIU Communication Systems”, related to my job in Linköping.

## Popular Science Activities

- I have written more than 100 blog posts on my Massive MIMO blog (see above).
- I am producing popular science videos in both English and Swedish for my YouTube channel (see above).
- I was interviewed by the Swedish newspapers Ny Teknik, Elektroniktidning, and Computer Sweden, 2021.
- I gave an interview on the Swedish television (SVT Östergötland) about “Future mobile masts”, 2019.
- I have given talks about future wireless communications and open science at the Science Day that is held in Linköping for high school teachers. It is given in October every year. I participated 2016, 2018, 2019.
- I wrote an article “Wireless Communication Goes Massive: Massive MIMO for 5G” in the Maxwell Future, Issue 21.1, 2017.
- I gave a video interview with the Swedish website Fjärde uppgiften in 2017. The video is called “Linköping har en viktig roll i morgondagens mobilsystem” and is available on YouTube.
- I gave a talk about “Claude Shannon 100 year: From information theory to information technology” at the Science Day for high school teachers, Linköping, October 2016.
- I wrote an article about “10 myths on Massive MIMO” in Elektroniktidningen, 2016.
- I gave several talks about future cellular networks at the Science Day during the Popular Science week for high school students, Linköping, October 2015 and October 2017.
- I gave an interview on the Swedish radio (P4 Östergötland) about “5G versus fiber”, 2015.

## Committees and Organization

- I am the Technical Program Co-Chair of the IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), Lucca, Italy, May 25-28, 2021.
- I am an elected member of the Signal Processing for Communications and Networking Technical Committee (SPCOM-TC). First term: 2017-2019. Second term: 2020-2022.
- I served as the Research Blog Officer of the Machine Learning for Communications Emerging Technology Initiative from 2019 to 2020.
- I served as Track Chair of the MIMO Communications and Signal Processing track at the 52nd Annual Asilomar Conference on Signals, Systems, and Computers, October 28-31, 2018.
- I served as the Technical Program Chair of the 2017 Joint IEEE SPS and EURASIP Summer School on Signal Processing for 5G Wireless Access, May 29 - June 1, Gothenburg, Sweden, 2017.
- I co-organized the Massive MIMO Communications Symposium at IEEE Global Conference on Signal and Information Processing (GlobalSIP), December 3-5, Atlanta, Georgia, 2014.
- I served as a Vice-Chair of Local Arrangements at IEEE Swedish Communication Technologies Workshop (Swe-CTW), October 19-21, Stockholm, Sweden, 2011.
- I have co-organized special sessions at Asilomar 2018, PIMRC 2019, Asilomar 2019, CAMSAP 2019, ICASSP 2020, SPAWC 2020.
- I have been a member of Technical Program Committees at the conferences GLOBECOM 2014-2019, ICC 2015-2019, ICC 2013-2014, PIMRC 2013, 2016-2019, SPAWC 2017-2019, WCSP 2012-2014, and WCNC 2015-2019.

## Assignments as Scientific Expert

- Examiner of the doctoral dissertation by David Neumann, TU München, Germany (September 2020).
- Independent expert witness in the court case between Vodafone Hutchison Australia and the Australian Competition and Consumer Commission in the Federal Court of Australia, 2019.



- Chair of the grading committee of the doctoral dissertation by Zain Ahmed Kahn, KTH Royal Institute of Technology, Sweden (October 2018).
- Faculty opponent at the doctoral dissertation by Ganesh Venkatraman, University of Oulu, Finland (September 2018).
- Examiner of the licentiate dissertation by Antzela Kosta, Linköping University, Sweden (September 2018).
- External reviewer of research project proposals, The Research Council of Norway (September 2018).
- Faculty opponent at the doctoral dissertation by Rikke Apelfröjd, Uppsala University, Sweden (April 2018).
- Chair of the grading committee at the doctoral dissertation by Demia Della Penda, KTH Royal Institute of Technology, Sweden (March 2018).
- Examiner of the doctoral dissertation by Stefan Dierks, TU München, Germany (February 2018).
- Faculty opponent at the doctoral dissertation by Johan Swärd, Lund University, Sweden (September 2017).
- Faculty opponent at the licentiate dissertation by Demia Della Penda, KTH Royal Institute of Technology, Sweden (March 2016).
- Faculty opponent at the doctoral dissertation by Janis Werner, Tampere University of Technology, Finland (November 2015).
- Member of 2015 review panel on “Signal and image processing and acoustics”, Academy of Finland.

### Reviewer in International Journals and Conferences

- I am a recurring reviewer of journal articles in IEEE Transactions on Signal Processing, IEEE Transactions on Wireless Communications, IEEE Transactions on Communications, IEEE Transactions on Vehicular Technology, IEEE Access, IEEE Communication Magazine, IEEE Wireless Communications Letters, IEEE Communications Letters, and IEEE Signal Processing Letters. I have received recognition as an Exemplary Reviewer several times (see below).
- I am a recurring reviewer of papers at high-quality international IEEE conferences such as GLOBECOM, ICC, PIMRC, SPAWC, VTC and WCNC.

## HONORS & AWARDS

- **AI 2020 Internet of Things Most Influential Scholars**, Honorable Mention given to the most cited scholars in the IEEE Internet of Things Journal and IEEE Transactions on Wireless Communications.
- **2020 IEEE Pierre-Laplace Early Career Technical Achievement Award** “for contributions to signal processing for communications and research reproducibility”.
- **2020 Communication Theory Technical Committee (CTTC) Early Achievement Award** “for contributions to MIMO communications and promoting wireless research through videos and social media”.
- **2019 IEEE Signal Processing Magazine Best Column Award**, for the lecture note column “Optimal Multiuser Transmit Beamforming: A Difficult Problem with a Simple Solution Structure”.
- **2019 IEEE Communications Society Fred W. Ellersick Prize**, for the magazine article “Massive MIMO: Ten Myths and One Critical Question”.
- **2019 EURASIP Early Career Award**, for “significant contributions to multi-antenna communications and open science”.

- **2018 IEEE Marconi Prize Paper Award in Wireless Communications**, for the journal article “Optimal Design of Energy-Efficient Multi-User MIMO Systems: Is Massive MIMO the Answer?”.
- **2018 Young Author Best Paper (YABP) Award from the IEEE ComSoc/VTS Italy Chapter** (last author): Awarded to Andrea Pizzo for the paper “Network Deployment for Maximal Energy Efficiency in Uplink with Multislope Path Loss”.
- **Exemplary Reviewer in IEEE Wireless Communications Letters**: Selected in 2018.
- **Senior Member of the Institute of Electrical and Electronics Engineers (IEEE)**, elevated in November 2017.
- **Best Paper Award (third author)**: 2017 International Conference on Wireless Communications and Signal Processing (WCSP) for work on cell-free massive MIMO.
- **Exemplary Reviewer in IEEE Transactions on Wireless Communications**: Selected in 2017.
- **2017 IEEE Sweden VT-COM-IT Joint Chapter Best Student Journal Paper Award (second author)**: Awarded to Jingya Li for the paper “Joint Precoding and Load Balancing Optimization for Energy-Efficient Heterogeneous Networks”.
- **2016 EURASIP Best PhD Award**: The European Signal Processing Association as selected my PhD thesis for this award, which is given at EUSIPCO 2016.
- **2015 Ingvar Carlsson Award**: I was selected by the Swedish Foundation for Strategic Research to a competitive programme that gives homecoming postdocs funding to launch their own independent and creative research careers in Sweden.
- **Best Paper Award (second author)**: 2015 IEEE International Conference on Communications (ICC), for work on load balancing and precoding in cellular networks.
- **2014 IEEE ComSoc Outstanding Young Researcher**: Awarded by the IEEE ComSoc EMEA Region Committee for “promising research activities for the benefit of the society”.
- **Best Paper Award (first author)**: 2014 IEEE Wireless Communications and Networking Conference (WCNC), for work on energy efficiency and massive MIMO communications.
- **Best Student Paper Award (third author, 2nd prize)**: 2014 IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM), for work on massive MIMO communications.
- **Exemplary Reviewer in IEEE Transactions on Communications**: Selected in 2014, 2015, and 2020.
- **Exemplary Reviewer in IEEE Communications Letters**: Selected three years in a row: 2012-2014.
- **Best Student Paper Award (first author)**: 2011 IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP) for work on precoding in cellular networks.
- **Best Paper Award (first author)**: 2009 International Conference on Wireless Communications and Signal Processing (WCSP) for work on cooperative multicell and multiantenna communication.
- **Guest Researcher**: Received grant as guest researcher at the Department of Signals and Systems (S2), Chalmers University of Technology, Sweden, in the Spring 2013.
- **Travel Scholarships**: Received several competitive scholarships for participating in scientific conferences during the doctoral studies (awarded from Ericsson Research Foundation and from Pleijel-fonden).

- **2006 DigSigProject Challenge:** First place in course competition on programming for DSP cards, during Master of Science studies. Texas Instruments sponsored the competition.
- **2005 Algorithm Implementation Course Competition:** First place in course competition on efficient programming, during Master of Science studies.

## SCIENTIFIC PUBLICATIONS

### Scientific Books and Book Chapters

[B5] Özlem Tugfe Demir, Emil Björnson, Luca Sanguinetti, “*Foundations of User-Centric Cell-Free Massive MIMO*,” Foundations and Trends® in Signal Processing: vol. 14, no. 3-4, pp. 162-472, 2021.

[B4] Andrea Pizzo, Luca Sanguinetti, Emil Björnson, “*Fundamental limits of energy efficiency in 5G multiple antenna systems*,” in Green Communications for Energy-Efficient Wireless Systems and Networks, H. A. Suraweera et al. (eds.), Chapter 9, IET, 2020.

[B3] Emil Björnson, Jakob Hoydis, Luca Sanguinetti, “*Massive MIMO Networks: Spectral, Energy, and Hardware Efficiency*,” Foundations and Trends® in Signal Processing: vol. 11, no. 3-4, pp. 154–655, 2017. (Supplementary MATLAB code is available with DOI: [10.1561/2000000093\\_supp](https://doi.org/10.1561/2000000093_supp))

[B2] Trinh Van Chien, Emil Björnson, “*Massive MIMO Communications*,” in 5G Mobile Communications, W. Xiang et al. (eds.), pp. 77-116, Springer, 2017.

[B1] Emil Björnson, Eduard Jorswieck, “*Optimal Resource Allocation in Coordinated Multi-Cell Systems*,” Foundations and Trends® in Communications and Information Theory, vol. 9, no. 2-3, pp. 113-381, 2013. (Supplementary MATLAB code is available with DOI: [10.1561/0100000069\\_supp](https://doi.org/10.1561/0100000069_supp))

### Overview Articles

[A18] Özlem Tugfe Demir, Emil Björnson, “*The Bussgang Decomposition of Nonlinear Systems: Basic Theory and MIMO Extensions*,” IEEE Signal Processing Magazine, vol. 38, no. 1, pp. 131-136, January 2021.

[A17] Emil Björnson, Özgecan Özdoğan, Erik G. Larsson, “*Reconfigurable Intelligent Surfaces: Three Myths and Two Critical Questions*,” IEEE Communications Magazine, vol. 58, no. 12, pp. 90-96, December 2020.

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- [C27] Rasmus Brandt, Emil Björnson, Mats Bengtsson, “*Weighted Sum Rate Optimization for Multicell MIMO Systems with Hardware-Impaired Transceivers*,” Proceedings of IEEE Conference on Acoustics, Speech, and Signal Processing (ICASSP), Florence, Italy, May 2014.
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- [C23] Nafiseh Shariati, Emil Björnson, Mats Bengtsson, Mérouane Debbah, “*Low-Complexity Channel Estimation in Large-Scale MIMO using Polynomial Expansion*,” Proceedings of IEEE Symposium on Personal, Indoor, Mobile and Radio Communications (PIMRC), London, UK, September 2013.
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- [C21] Emil Björnson, Agisilaos Papadogiannis, Michail Matthaiou, Mérouane Debbah, “*On the Impact of Transceiver Impairments on Relaying*,” Proceedings of IEEE Conference on Acoustics, Speech, and Signal Processing (ICASSP), pp. 4948-4952, Vancouver, Canada, May 2013.
- [C20] John Flåm, Emil Björnson, Saikat Chatterjee, “*Pilot Design for MIMO Channel Estimation: An Alternative to the Kronecker Structure Assumption*” Proceedings of IEEE Conference on Acoustics, Speech, and Signal Processing (ICASSP), pp. 5061-5064, Vancouver, Canada, May 2013.
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Last update: May 1, 2021