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# Curriculum Vitae

## Research Interests

My research interests are at the intersection of signal processing algorithms, algorithmic theory, and digital very large-scale integration (VLSI) circuits and systems. The current focus of my research group is on massive multiple-input multiple-output (MIMO) wireless communication systems, nonlinear signal processing, and machine learning for wireless positioning.

## Education

*July 2009:* Ph.D. in Information Technology and Electrical Engineering, ETH Zurich, Switzerland. Doctoral dissertation: "Iterative MIMO Decoding: Algorithm and VLSI Implementation Aspects," thesis advisors: Prof. W. Fichtner (Integrated Systems Laboratory, ETH Zurich) and Prof. H. Bölcskei (Communication Technology Laboratory, ETH Zurich).

*Jan. 2006 – July 2009:* Doctoral studies carried out jointly at the Integrated Systems Laboratory and the Communication Technology Laboratory, Department of Information Technology and Electrical Engineering, ETH Zurich, Switzerland.

*Dec. 2005:* Engineering diploma (equivalent to M.S. degree) in Information Technology and Electrical Engineering, ETH Zurich, Switzerland. Master's Thesis: "Sphere Decoding with Resource Constraints," carried out at the Information Systems Laboratory (with Prof. A. Paulraj), Department of Electrical Engineering, Stanford University, CA, USA.

*Sept. 2000 – Dec. 2005:* Undergraduate and graduate studies in Information Technology and Electrical Engineering, ETH Zurich, Switzerland.

*Feb. 2000 – Aug. 2013:* Service member of the Swiss Armed Forces in terrestrial reconnaissance.

## Academic Positions

*October 2019 – present :* Associate Professor at the School of Electrical and Computer Engineering at Cornell University, Ithaca, NY and at Cornell Tech, New York, NY, USA.

*Jan. 2014 – present:* Adjunct Professor at the Department of Electrical and Computer Engineering at Rice University, Houston, TX, USA.

*July 2019 – October 2019:* Assistant Professor at the School of Electrical and Computer Engineering at Cornell Tech, New York, NY, USA.

*Jan. 2014 – October 2019:* Assistant Professor at the School of Electrical and Computer Engineering at Cornell University, Ithaca, NY, USA.

*Sep. 2013 – Dec. 2013:* Visiting Assistant Professor at the School of Electrical and Computer Engineering, Cornell University, NY, USA.

*Jan. 2013 – Dec. 2013:* Research Scientist at the Department of Electrical and Computer Engineering, Rice University, TX, USA.

*Mar. 2011 – Dec. 2012:* Postdoctoral Researcher at the Digital Signal Processing (DSP) group (with Prof. R. G. Baraniuk), Department of Electrical and Computer Engineering, Rice University, TX, USA.

*Aug. 2009 – Feb. 2011:* Postdoctoral Researcher at the Communication Technology Laboratory (with Prof. H. Bölcskei), Department of Information Technology and Electrical Engineering, ETH Zurich, Switzerland.

*Jan. 2006 – July 2009:* Research and Teaching Assistant at the Integrated Systems Laboratory and the Communication Technology Laboratory, Department of Information Technology and Electrical Engineering, ETH Zurich, Switzerland.

*Jan. 2005 – July 2005:* Visiting Researcher at the Information Systems Laboratory (with Prof. A. Paulraj), Department of Electrical Engineering, Stanford University, CA, USA.

## Awards

*2019:* Ph.D. students Alexandra Gallyas-Sanhueza and Oscar Castañeda were awarded a $100,000 Qualcomm innovation fellowship for the project "PPAC: In-Memory Accelerator for Matrix-Vector Products."

*2018:* Paper by Ph.D. students Kaipeng Li (Rice University) and Charles Jeon (Cornell University) on "Feedforward Architectures for Decentralized Precoding in Massive MU-MIMO Systems," was awarded 2nd place at the student paper contest of the 52nd Annual Asilomar Conference on Signals, Systems, and Computers.

*2017:* IEEE Wireless Communication Letters Exemplary Reviewer.

*2017:* The paper "Towards a Deeper Understanding of Training Quantized Neural Networks" with H. Li, S. De, Z. Xu, H. Samet, and T. Goldstein received the Google Best Student Paper Award at the ICML Workshop on Principled Approaches to Deep Learning.

*2017:* Received a US NSF CAREER award from the Division of Computing and Communication Foundations (CCF) on the first attempt. The $606,661 award supports a five-year interdisciplinary research project on hardware-accelerated Bayesian inference.

*2017:* Ph.D. students Emre Gonultaş and Oscar Castañeda were selected as finalists of the 2017 Qualcomm Innovation Fellowship.

*2016:* Michael Tien '72 Excellence in Teaching Award, Cornell University, College of Engineering.

*2016:* Paper with Ph.D. student Igor Labutov on "Calibrated Self-Assessment" received the Best Student Paper award at the 9th International Conference on Educational Data Mining (EDM).

*2014:* IEEE Wireless Communication Letters Exemplary Reviewer.

*2013:* Shared the Swisscom/ICTnet Innovations Award 2013 on "Design of a Wideband Analog-to-Information Converter for Cognitive Radio" with D. Bellasi, L. Bettini, and C. Benkeser.

*2013:* IEEE Wireless Communication Letters Exemplary Reviewer.

*2013:* Best Demo Award at the IEEE International Symposium on Circuits and Systems (ISCAS) for the demonstration "Real-Time Audio Restoration using Sparse Signal Recovery."

*2011:* Fellowship for Advanced Researchers from the Swiss National Science Foundation (SNSF).

*2011:* ETH Medal for the doctoral dissertation on "Iterative MIMO Decoding: Algorithms and VLSI Implementation Aspects." Research carried out at the Department of Information Technology and Electrical Engineering, ETH Zurich, Switzerland.

*2010:* Shared the Swisscom/ICTnet Innovations Award 2010 on "VLSI Implementation of Soft-Input Soft-Output MMSE Parallel Interference Cancellation" with S. Fateh and D. Seethaler.

*2010:* Single tree-search sphere decoding (jointly developed with with Prof. A. Burg) was explicitly cited in the Vodafone Innovations Award 2010 given to Prof. H. Bölcskei.

*2008:* Best Student Paper Award at the IEEE International Symposium on Circuits and Systems (ISCAS) for the paper entitled "VLSI Architecture for Data-Reduced Steering Matrix Feedback in MIMO Systems."

*2007:* 1$^{st}$ place at the Student Paper Contest of the 41th Asilomar Conference on Signals, Systems, and Computers for the paper entitled "Matrix Decomposition Architecture for MIMO Systems: Design and Implementation Trade-Offs."

*2005:* ETH Medal for the M.S. Thesis on "Sphere Decoding with Resource Constraints." Research carried out at the Information Systems Laboratory (with Prof. A. Paulraj), Department of Electrical Engineering, Stanford University, CA, USA.

*2005:* ETH Zurich Travel Grant for travel expenses to Stanford University, CA, USA.

## Academic Work Experience and Teaching Activities

*Spring 2014 – 2019:* ECE 4740 "Digital VLSI Design" undergraduate course at the School of ECE, Cornell University, NY, USA. (Enrollment in 2014–2018 between 24 and 72 students.)

*Fall 2018:* ECE 4670 "Digital Communication System Design" undergraduate course at the School of ECE, Cornell University, NY, USA. (Enrollment 25 students.)

*Fall 2015 – 2017:* ECE 5680 "Wireless Communication" graduate course at the School of ECE, Cornell University, NY, USA. (Enrollment between 6 and 18 students.)

*Fall 2014:* ECE 5950 "Special Topics in ECE: Sparse Signal Processing" graduate course at the School of ECE, Cornell University, NY, USA. (Enrollment 11 students.)

*Oct. 2013 – Dec. 2013:* Guest lecturer for ELEC 547 "Computer Vision" and ELEC 301 "Introduction to Signals and Systems" at the ECE Dept. of Rice University, TX, USA. (Enrollment approximately 20 students.)

*Dec. 2011 – Dec. 2013:* Supervisor of three Ph.D. candidates on the design of a machine-learning-based personalized learning system at the ECE Dept. of Rice University, TX, USA. The developed technology is now used at OpenStax, a nonprofit educational initiative based at Rice university.

*Nov. 2011 – Dec. 2013:* Mentor of Group Projects for ELEC 301 "Introduction to Signals and Systems" at the ECE Dept. of Rice University, TX, USA.

*June 2009 – Dec. 2011:* Main supervisor of Laboratory Courses for B.S. and M.S. students at the Communication Technology Laboratory, ETH Zurich, Switzerland.

*Jan. 2006 – Feb. 2011:* Supervisor of 14 M.S. Theses and 20 Semester Projects at the Integrated Systems Laboratory and the Communication Technology Laboratory, ETH Zurich, Switzerland; leading the specification, design, measurement, and testing of more than 15 application-specific integrated circuits (ASICs).

*Jan. 2006 – June 2009:* Main teaching assistant for the lecture VLSI III (Fabrication and Verification of Highly Integrated Circuits). Organization of the exercises and the supervision of testing the fabricated application specific integrated circuits (ASICs).

*Jan. 2006 – June 2009:* Teaching assistant for VLSI I (Architectures of Highly Integrated Circuits) and VLSI II (Design of Highly Integrated Circuits). Short lectures on specific topics in IC design, exercise preparation, and examination preparation and grading.

*Aug. 2005 – July 2008:* Teaching Assistant at the Integrated Systems Laboratory, ETH Zurich for the Digital Audio practical training, projects, and seminar (PPS) course. Student mentoring for hardware (PCB design) and software development of DSP-based real-time audio-processing algorithms.

## Industrial Work Experience and Consulting

*Aug. 2008 – Jan. 2009:* Consultant for Celestrius AG, an ETH Zurich spinoff specialized in the field of multi-antenna (MIMO) wireless communication (working on the development and silicon integration of high-performance data detection algorithms for IEEE 802.11n wireless LAN).

*Sept. 2004 – Dec. 2004:* Internship at Philips Semiconductors, Digital Baseband, Zurich, Switzerland. The work included the development of a company-wide system-level verification standard for cellular (GSM and EDGE) baseband system-on-chips.

## Research Grants and Industry Support

### Current Support

*SRC JUMP:* "ComPPAC: Hardware and Compilation for Versatile In-Memory Acceleration of Matrix-Vector Product-Like Tasks," *co-principal investigator*, (PI Prof. Zhiru Zhang), total seed fund of $60,000, seed funding for PI Studer: $30,000, duration: 8/1/2019-7/31/2020.

*NSF SpecEES:* "SPASS: Spatio-Spectral Sensing with Wideband Feature Extraction Arrays," *principal investigator*, (co-PI: Prof. Alyssa Apsel), total funding $641,999, funding for PI Studer: $320,999, duration 9/1/2018–8/31/2021.

*SRC JUMP:* "ComSenTer: A Center for Converged TeraHertz Communications and Sensing," *principal investigator*, (Center Director at UCSB: Prof. Mark Rodwell), total funding for PI Studer $1,015,835, duration 5/1/2018–12/31/2022.

*NSF CNS, Collaborative Research:* "NeTS: Small: Collaborative Research: BRICK: Breaking the I/O and Computation Bottlenecks in Massive MIMO Base Stations," *principal investigator*, (PI at Rice University: Prof. J. R. Cavallaro), total funding $500,000, funding for PI Studer: $250,000, duration 9/1/2017–8/31/2020.

*NSF ECCS and SRC:* "E2CDA: TYPE 1: Durable, Energy-Efficient, Pausable Processing in Polymorphic Memories (DEEP3M)," *co-principal investigator*, (PI at Cornell: Prof. Huili (Grace) Xing), total funding $1,866,663, estimated funding for co-PI Studer: $243,000, duration 10/1/2017–9/30/2020.

*NSF CCF, SHF:* "CAREER: Hardware Accelerated Bayesian Inference via Approximate Message Passing: A Bottom-Up Approach," *principal investigator*, total funding for PI Studer $606,661, duration 2/15/2017–1/31/2022.

*NSF CCF, Collaborative Research:* "AitF: EXPL: Collaborative Research: Approximate Discrete Programming for Real-Time Systems," *principal investigator* (PI at University of Maryland: Prof. T. Goldstein), total funding $400,000, funding for PI Studer: $200,000, duration 9/1/2015–12/31/2018.

*NSF EECS, Collaborative Research:* "BAMM: Baseband Accelerators for Massive MIMO," *principal investigator* (PI at Rice University: Prof. J. R. Cavallaro), total funding $331,330, funding for PI Studer: $165,665, duration 9/1/2014–8/31/2017 (no cost extension until 12/31/2018).

*Xilinx Inc., Donation:* Unrestricted gift from Xilinx Inc., total funding for PI Studer: $82,500 (funding of $7,500 biannually received since 5/11/2015).

**Past Support**

*NVIDIA GPU Grant Program:* Funding of $5,000 in the form of a NVIDIA Quadro P6000 received on 1/24/2018.

*Cornell CTE Faculty Grant:* "Data-Collection Campaign for Machine Learning in Education," *principal investigator*, funding $1,500 received on 2/19/2015.

*Cornell New Faculty Institute Research Stipend:* Funding of $1,000 received on 2/9/2015.

*SNSF Grant PA00P2-134155:* "Sparse-Signal Recovery with Statistical Models: Algorithms, Performance, and Implementation," (provided by the Swiss National Science Foundation), *principal investigator*, funding $102,000, duration 3/1/2011–2/28/2013.

## Ph.D. Students and Postdocs

**Current Students**

*Alexandra Gallyas Sanhueza:* Research topic: "Baseband Algorithms for Terahertz Communication Systems," Ph.D. student; start: Aug. 2018

*Brian Rappaport:* Research topic: "Simultaneous Sensing and Communication," Ph.D. student; start: Aug. 2018

*Seyed Hadi Mirfarshbafan:* Research topic: "VLSI Designs for Terahertz Communication Systems," Ph.D. student; start: Aug. 2018

*Saïd Medjkouh:* Research topic: "Machine Learning for Wireless Positioning and Tracking," Ph.D. student; start: Aug. 2018

*Oscar Castañeda:* Research topics: "Discrete Programming, Approximate Semidefinite Relaxation, and Hardware-Aware Machine Learning," Ph.D. student; start: Aug. 2016; expected graduation in 2021

*Emre Gönültaş:* Research topic: "Analog-to-Feature (A2F) Conversion for Low-Power Classification,' Ph.D. student; start: Aug. 2016; expected graduation in 2021

*Ramina Ghods:* Research topic: "Nonlinear Signal Processing," Ph.D. student; start: Aug. 2014; expected graduation: Aug. 2019

**Former Students**

*Charles Jeon:* Thesis title: "Data Detection for Massive MU-MIMO Systems," Ph.D. student; Jan. 2014 to Dec. 2018; ECE Ph.D. teaching assistant award; now at Intel Labs, Hillsboro, OR

*Michaël Pelissier:* Project title: "Compressive-Sensing RF Receiver," postdoctoral researcher; Oct. 2015 to Aug. 2016; now at CEA-Leti, Laboratoire d'éctronique des technologies de l'information, Grenoble, France

*Igor Labutov:* Thesis title: "Machine Learning Methods For Machine Teaching," Ph.D. student; Jan. 2014 to June 2016; from 2016 to 2018 was with Prof. Tom Mitchell at Carnegie Mellon University, Pittsburgh, PA and since 2018 is a Runway Startup postdoctoral researcher at Cornell Tech, NY

*Paul Chollet:* Project title: "Analog-to-Feature (A2F) Conversion for ECG Low-Power Signal Classification," visiting Ph.D. student; Aug. 2016 to Dec. 2016; now Assistant Professor at Télécom ParisTech, Paris, France

## Participation in External Ph.D. Thesis Committees

*Marguerite Marnat:* "Radio Frequency Receivers Based on Compressive Sampling for Feature Extraction in Cognitive Radio Applications," Université de Grenoble, Saint Martin d'Hères, France, Nov. 2018.

*David Bellasi:* "Toward Energy-Proportional Compressive Sensors," Department of Information Technology and Electrical Engineering, ETH Zurich. Switzerland, Dec. 2017.

*Jérémy Nadal:* "Filtered Multicarrier Waveforms in the Context of 5G: Novel Algorithms and Architecture Optimization," IMT Atlantique, École Mines-Télécom, Bertagne-Pays de la Loire, France, Dec. 2017.

*Nicholas Preyss:* "Modulation, Coding, and receiver Design for Gigabit mmWave Communication," Electrical Engineering Department (EDEE), École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, July 2016.

*Michael Wu:* "Efficient Detectors for LTE Uplink Systems: From Small to Large Systems," Department of Electrical and Computer Engineering, Rice University, Houston, TX, March 2016.

*Schekeb Fateh:* "Calibration Techniques for Digitally Assisted Nyquist-Rate ADCs," Department of Information Technology and Electrical Engineering, ETH Zurich, Switzerland, Jan. 2016.

*Bei Yin:* "Low-Complexity Detection and Precoding for Massive MIMO-OFDM Systems: Algorithm, Architecture, and Application," Department of Electrical and Computer Engineering, Rice University, Houston, TX, Sept. 2014.

*Iker S. Polancos:* "Detection and Decoding Algorithms of Multi-Antenna Diversity Techniques for Terrestrial DVB Systems," Dept. Electronics and Computer Science, University of Mondragón, Arrasate, Basque Country, Spain, Nov. 2010.

## Diversity and Outreach Activities

*July 2019:* Lead of the one-week research project "Bits over the Air: Experiencing Wireless Systems" for Cornell's CATALYST Academy, a one-week summer residential program for underrepresented minority high-school sophomores, juniors, and seniors.

*July 2015, 2016, and 2018:* Field-session presenter for Cornell's CURIE Academy, a one-week summer residential program for rising female high school sophomores, juniors, and seniors.

*May 2015, 2016, and 2017:* Lecturer for Math Day at Boynton Middle School, Ithaca, in which Cornell professors replace the usual math lessons for the day.

*Summer 2016:* Supervisor of Felipe Suárez Colmenares from the Universidad de los Andes, Bogotá, Colombia, for Cornell's CienciAmerica summer program.

*Summer 2015:* Supervisor of Oscar Castañeda from Universidad del Valle de Guatemala, Guatemala, for Cornell's CienciAmerica summer program.

*July 2015:* Field-session presenter for the CATALYST Academy, a one-week summer residential program for rising high school sophomores, juniors, and seniors.

*July 2014:* Field-session presenter (jointly with Prof. Zhang) for the CATALYST Academy, a one-week summer residential program for rising high school sophomores, juniors, and seniors.

## Professional Activities

### Memberships

- ***IEEE Senior Member*** since Sep. 2014.
- Member of the IEEE Communications, IEEE Circuits and Systems, IEEE Information Theory, IEEE Signal Processing, and IEEE Solid State Circuits societies.
- Member of the following technical committees:
  - IEEE Machine Learning for Communications Emerging Technologies Initiatives since Sep. 2018.
  - IEEE Signal Processing for Communications and Networking (SPCOM) Technical Committee since Jan. 1, 2017 (regional representative for the U.S., member of the Education Subcommittee since March 2017-May 2019, chair of the Education Subcommittee since May 2019).
  - IEEE Design and Implementation of Signal Processing Systems (DISPS) Technical Committee since Jan. 2017.
  - IEEE Circuits and Systems for Communication (CASCOM) Technical Committee since May. 2016.

### Conference and Workshop (Co-)Organization

- ***Associate Editor*** for the IEEE Open Journal of Circuits and Systems (OJCAS) since Aug. 2019.
- ***Technical Chair*** for the Asilomar Conference on Signals, Systems, and Computers, Oct. 2019.
- ***Technical Chair*** for the IEEE Intl. Workshop on Signal Processing Systems (SiPS), Oct. 2019.
- ***Technical Area Chair*** for the "Architecture and Implementation" track, at the Asilomar Conference on Signals, Systems, and Computers, Oct. 2017.
- ***Publication Chair*** (together with Prof. G. Durisi) for the 2017 IEEE International Symposium on Information Theory (ISIT), Aachen, Germany, June 2017.
- Technical program committee (TPC) member for the following conferences and workshops:
  - ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2014
  - European Signal Processing Conference (EUSIPCO), 2014 and 2017
  - European Solid State Circuit Conference (ESSCIRC), 2016, 2017, and 2018
  - IEEE Global Communications Conference (GLOBECOM), 2019
  - IEEE Global Conference on Signal and Information Processing (GlobalSIP), 2014 to 2016, and 2019
  - IEEE Intl. Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2014
  - IEEE Intl. Conference on Electronic Circuits and Systems (ICECS), 2014
  - IEEE Intl. Symposium on Circuits and Systems (ISCAS), 2013 and 2015
  - IEEE Intl. Symposium on Turbo Codes & Iterative Information Processing, 2016

  - IEEE Intl. Symposium on Wireless Communication Systems (ISWCS), 2018 and 2019
  - IEEE Intl. Workshop on Signal Processing Systems (SiPS), 2017
  - IEEE Vehicular Technology Conference (VTC Fall), 2014
  - IEEE Vehicular Technology Conference (VTC Spring), 2015
  - IEEE Intl. Conference on Very Large Scale Integration (VLSI-SoC), 2017
  - IEEE Intl. Symposium on Wireless Communication Systems, 2018
  - IEEE Intl. Workshop on Signal Processing Advances in Wireless Communications (SPAWC), 2017 to 2019
  - IEEE Intl. Workshop on Signal Processing Systems (SiPS), 2018
  - International Conference on Wireless Communications and Signal Processing (WCSP; co-sponsored by IEEE), 2018
  - Signal Processing with Adaptive Sparse Structured Representations (SPARS), 2017

- Guest editor for the following journal special issues:
  - IEEE Transactions on Circuits and Systems I, 2016, on "International Symposium on Circuits and Systems Special Issue" (with Prof. E. Da Silva *et al.*)
  - EURASIP Journal on Wireless Communications and Networking, Dec. 2015, on "Recent Advances in Massive MIMO Systems" (with Prof. R. de Lamare)
  - EURASIP Journal on Wireless Communications and Networking, Dec. 2011, on "Algorithm and Implementation Aspects of Channel Codes and Iterative Receivers" (with Prof. J. R. Cavallaro and Prof. A. P. Burg)

- Organizer of the following special sessions:
  - 52nd Asilomar Conference on Signals, Systems, and Computers, CA, USA, Nov. 2018, on "Machine Learning for Wireless Systems I and II."
  - 50th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, Nov. 2016, on "Hardware Aspects for Compressive Sensing and Analog-to-Information Conversion" and "Algorithm and Hardware Aspects for 5G Wireless Systems"
  - 47th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, Nov. 2013 on "Implementation Aspects for Full Duplex and Large-Scale MIMO Wireless Systems"
  - 46th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, Nov. 2012, on "Compressive Sensing"
  - IEEE Intl. Symposium on Circuits and Systems (ISCAS), Rio de Janeiro, Brazil, May 2011, on "VLSI Architectures for LDPC Coding/Decoding," (with Prof. A. Burg)

- Organizer of the following workshops:
  - Neural Information Processing Systems (NIPS) Conference, Barcelona, Spain, Dec. 2016, on "Machine Learning for Education" (with Prof. R. G. Baraniuk, Dr. A. S. Lan, and Dr. J. Ngiam)
  - Intl. Conference on Machine Learning (ICML), Lille, France, July 2015, on "Machine Learning for Education" (with Prof. R. G. Baraniuk, Prof. E. Brunskill, Dr. J. Huang, Prof. M. van der Schaar, Prof. M. C. Mozer, and Dr. A. S. Lan)
  - Neural Information Processing Systems (NIPS) Conference, Quebec, Canada, Dec. 2014, on "Human Propelled Machine Learning" (with Prof. R. G. Baraniuk and Prof. M. C. Mozer)

  - IEEE Global Communications Conference (GLOBECOM), Austin, TX, Dec. 2014 on "Massive MIMO: From Theory to Practice" (with Prof. O. Edfors, Prof. L. van der Perre, and Prof. F. Rusek)

- Committee member for the Student Paper Contest at the 45th Asilomar Conference on Signals, Systems, and Computers (ACSSC), Pacific Grove, CA, USA, Nov. 2011.

**Review Activities**

- Reviewer of project proposals for the following agencies:
  - US National Science Foundation (NSF), 2016 and 2017
  - Fonds zur Förderung der Wissenschaftlicher Forschung (FWF), Vienna, Austria, 2014
- Reviewer for the following journals (in alphabetical order):
  - Hindawi Mobile Information Systems
  - IEEE Communications Letters
  - IEEE Journal of Selected Topics in Signal Processing
  - IEEE Signal Processing Letters
  - IEEE Signal Processing Magazine
  - IEEE Transactions on Circuits and Systems I
  - IEEE Transactions on Circuits and Systems II
  - IEEE Transactions on Communications
  - IEEE Embedded Systems Letters
  - IEEE Transactions on Image Processing
  - IEEE Transactions on Information Theory
  - IEEE Transactions on Signal Processing
  - IEEE Transactions on Vehicular Technology
  - IEEE Transactions on Very Large Scale Integration Systems
  - IEEE Transactions on Wireless Communications
  - IEEE Wireless Communication Letters **(exemplary reviewer award in 2013, 2014, and 2017)**
  - Elsevier Applied and Computational Harmonic Analysis
  - Elsevier Intl. Journal of Electronics and Communications
  - Elsevier Signal Processing
  - EURASIP Journal on Signal Processing
  - EURASIP Journal on Advances in Signal Processing
  - European Transactions on Telecommunications
  - Arabian Journal for Science and Engineering
  - IET Circuits, Devices and Systems
  - Springer Journal of Signal Processing Systems
- Reviewer for the following conferences (in alphabetical order):
  - Asilomar Conference on Signals, Systems, and Computers (ACSSC)
  - European Conference on Signal Processing (EUSIPCO)

  - IEEE Global Communications Conference (GLOBECOM)
  - IEEE Intl. Symposium on Information Theory (ISIT)
  - IEEE Intl. Conference on Acoustics, Speech, and Signal Processing (ICASSP)
  - IEEE Intl. Symposium on Circuits and Systems (ISCAS)
  - IEEE Intl. Communications Conference (ICC)
  - IEEE Intl. Workshop on Signal Processing Advances for Wireless Communications (SPAWC)
  - IEEE Intl. Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)
  - IEEE Intl. Symposium on Wireless Communication Systems (ISWCS)
  - IEEE Intl. Conference on Communications and Signal Processing (ICCSP)
  - IEEE Intl. Conference on Electronics, Circuits, and Systems (ICECS)
  - IEEE Intl. Symposium on Turbo Codes & Iterative Information Processing (ISTC)
  - IEEE Intl. Conference on Electrical Engineering, Computing Science and Automatic Control (CCE)
  - IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM)
  - IEEE Vehicular Technology Conference (VTC)
  - IEEE Wireless Communications and Networking Conference (WCNC)
  - Information Theory Workshop (ITW)
  - Intl. Data Compression Conference (DCC)
  - Intl. ITG Conference on Systems, Communications, and Coding (SCC)
  - Intl. ITG Workshop on Smart Antennas (WSA)
  - Intl. Conference on Sampling Theory and Applications (SampTA)

- Conference session chair:
  - IEEE GLOBECOM, Abu Dhabi, Dec. 2018 on "Detection and Estimation 2"
  - 52nd Asilomar Conference on Signals, Systems, and Computers (ACSSC), Pacific Grove, Nov. 2018 on "Machine Learning for Wireless Systems I and II"
  - IEEE Intl. Symposium on Circuits and Systems (ISCAS), Florence, Italy, May, 2018, on "Enabling baseband Technologies for 5G & Beyond", "Technology and Circuits for Communication," and "Wireline Communications 2."
  - 2018 Information Theory and Applications Workshop, San Diego, CA, Feb. 2018 on "Sparse Signal Processing."
  - 51st Asilomar Conference on Signals, Systems, and Computers (ACSSC), Pacific Grove, CA, USA, Nov. 2017 on "Computer Architecture"
  - 42nd IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Mar. 2017, New Orleans, USA, on "mmWave MIMO and Beamforming"
  - 22nd European Signal Processing Conference (EUSIPCO), Lisbon, Portugal, Sep. 2014, on "Design and Implementation of Signal Processing Systems"
  - 51st Annual Allerton Conference on Communication, Control, and Computing, Monticello, IL, Oct. 2013 on "Sparse Data Analysis"
  - IEEE Intl. Symposium on Information Theory (ISIT), Cambridge, MA, USA, July 2012, on "Compressive Sensing and Algorithms"
  - 45th Asilomar Conference on Signals, Systems, and Computers (ACSSC), Pacific Grove, CA, USA, Nov. 2011 on "Advances in Compressive Sensing"

**Cornell Internal Activities**

- Chair of the Cornell Tech ECE faculty hiring committee (Aug. 2019 – present)
- Chair of the Cornell ECE colloquium committee (May. 2017 – present)
- Cornell ECE graduate committee (Jan. 2014 – Aug. 2017)
- Cornell ECE colloquium committee (Jan. 2015 – May. 2017)
- Cornell ECE faculty search committee since Spring 2017
- Member of the Cornell ECE graduate field since Jan. 2014

## Languages

*German:* Native language.

*English:* Fluent in speech and writing.

*French:* Good in speech and writing.

*Italian:* Basic skills.

## References

References available upon request.

# Publications, Talks, and Patents

## 1. Book Chapters and Magazine Articles

1.1 R. G. Baraniuk, T. Goldstein, A. C. Sankaranarayanan, C. Studer, A. Veeraraghavan, and M. Wakin, "Compressive Video Sensing: Algorithms, Architectures, and Applications," IEEE Signal Processing Magazine, Vol. 34, No. 1, pp. 52–66, Jan. 2017 **(feature article)**

1.2 C. Studer, M. Wenk, and A. Burg, "VLSI Implementation of Hard- and Soft-Output Sphere Decoding for Wide-Band MIMO Systems," VLSI-SOC: Forward-Looking Trends in IC and Systems Design, IFIP Advances in Information and Communication Technology, J. L. Ayala, D. Atienza, and R. Reis, Eds., Springer Boston, Vol. 373, pp. 128–154, 2012 **(invited)**

## 2. Journal Publications

Representative papers marked with an asterisk ⋆

2.1 S. H. Mirfarshbafan, R. Ghods, A. Gallyas-Sanhueza, and C. Studer, "Beamspace Channel Estimation for Massive MIMO mmWave Systems: Algorithm and VLSI Design," IEEE Selected Areas in Communications, *submitted*

2.2 O. Castañeda, S. Jacobsson, G. Durisi, T. Goldstein, and C. Studer, "Finite-Alphabet MMSE Equalization for All-Digital Massive MU-MIMO mmWave Communication," IEEE Selected Areas in Communications, *submitted*

2.3 C. Jeon, R. Ghods, A. Maleki, and C. Studer, "Optimal Data Detection in Large MIMO," IEEE Transactions on Information Theory, *submitted*

2.4 J. Deng, O. Tirkkonen, S. Medjkouh, and C. Studer, "Channel Charting via Multipoint Massive MIMO Cooperation," IEEE Journal on Selected Areas in Communications (JSAC), *submitted*

2.5 R. Ning, A. E. Waters, C. Studer, and R. G. Baraniuk, "SPRITE: A Response Model for Multiple Choice Testing," Journal of Educational Data Mining, *submitted*

2.6 C. Studer, "Recovery of Signals with Low Density," IEEE Transactions on Information Theory, *submitted*

2.7 A. S. Lan, C. Studer, and R. G. Baraniuk, "Time-Varying learning and Content Analytics via Sparse Factor Analysis," Psychometrica, *submitted*

2.8 C. Studer, T. Goldstein, W. Yin, and R. G. Baraniuk, "Democratic Representations," Applied Computational Harmonic Analysis, *submitted*

2.9 J. Deng, O. Tirkkonen, and C. Studer, ""MmWave Multiuser MIMO Precoding with Fixed Subarrays and Quantized Phase Shifters," IEEE Transactions on Vehicular Technology, Sep. 2019

2.10 C. Jeon, O. Castañeda, and C. Studer, "A 354Mb/s 0.37mm$^2$ 151mW 32-User 256-QAM Near-MAP Soft-Input Soft-Output Massive MU-MIMO Data Detector in 28nm CMOS," IEEE Solid-State Circuits Letters, Vol. 2, No. 9, pp. 127–130, Sept. 2019, **(invited paper)**

2.11 C. Jeon, K. Li, J. R. Cavallaro, and C. Studer, "Decentralized Equalization with Feedforward Architectures for Massive MU-MIMO," IEEE Transactions on Signal Processing, Vol. 67, No. 17, pp. 4418–4432, July 2019

2.12 S. Jacobsson, G. Durisi, M. Coldrey, and C. Studer, "Linear Precoding with Low-Resolution DACs for Massive MU-MIMO-OFDM Downlink," IEEE Transactions on Wireless Communications, Vol. 18, No. 3, pp. 1595–1609, Mar. 2019

2.13 C. Zhang, Z. Wu, C. Studer, Z. Zhang, and X. You, "Efficient Soft-Output Gauss-Seidel Data Detector for Massive MIMO Systems," IEEE Transactions on Circuits and Systems I: Regular Papers, Oct. 2018

2.14 *C. Studer, S. Medjkouh, E. Gönültaş, T. Goldstein, and O. Tirkkonen, "Channel Charting: Locating Users within the Radio Environment using Channel State Information," IEEE Access, pp. 47682–47698, Aug. 2018

2.15 *T. Goldstein and C. Studer, "PhaseMax: Convex Phase Retrieval via Basis Pursuit," IEEE Transactions on Information Theory, Vol. 64, No. 4, pp. 2675–2689, April 2018

2.16 O. Castañeda, T. Goldstein, and C. Studer, "VLSI Designs for Joint Channel Estimation and Data Detection in Large SIMO Wireless Systems," IEEE Transactions on Circuits and Systems-I: Regular Papers, Vol. 65, No. 3, pp. 1120-1132, Mar. 2018, **(invited; acceptance rate 4.3% of all presented ISCAS papers)**

2.17 M. Pelissier and C. Studer, "Non-Uniform Wavelet Sampling for RF Analog-to-Information Conversion," IEEE Transactions on Circuits and Systems I, Vol. 65, No. 2, pp. 471–484, Feb. 2018, **(IEEE T-CAS I 24$^{th}$ most popular article in Feb. 2018)**

2.18 M. Wu, B. Yin, C. Dick, J. R. Cavallaro, and C. Studer, "Implicit vs. Explicit Approximate Matrix Inversion for Wideband Massive MU-MIMO Data Detection," Journal of Signal Processing Systems, Dec. 2017, **(invited paper)**

2.19 *O. Castañeda, S. Jacobsson, G. Durisi, M. Coldrey, T. Goldstein, and C. Studer, "1-bit Massive MU-MIMO Precoding in VLSI," IEEE Journal on Emerging and Selected Topics in Circuits and Systems, Dec. 2017, **(IEEE JETCAS 15$^{th}$ most popular article in Dec. 2017)**

2.20 K. Li, R. Sharan, Y. Chen, T. Goldstein, J. R. Cavallaro, C. Studer, "Decentralized Baseband Processing for Massive MU-MIMO Systems," IEEE Journal on Emerging and Selected Topics in Circuits and Systems, Dec. 2017, **(IEEE JETCAS 20$^{th}$ most popular article in Dec. 2017)**

2.21 *S. Jacobson, G. Durisi, M. Coldrey, T. Goldstein, and C. Studer, "Quantized Precoding for Massive MU-MIMO," IEEE Transactions on Communications, Vol. 65, No. 11, pp. 4670–4684, Nov. 2017

2.22 A. S. Lan, A. E. Waters, C. Studer, and R. G. Baraniuk, " BLAh: Boolean Logic Analysis for Graded Student Response Data," IEEE Journal of Selected Topics in Signal Processing, Vol. 11, No. 5, pp. 754–764, July 2017

2.23 S. Jacobson, G. Durisi, M. Coldrey, U. Gustavsson, and C. Studer, "Throughput Analysis of Massive MIMO Uplink with Low-Resolution ADCs ," IEEE Transactions on Wireless Communications, Vol. 16, No. 6, April 2017, **(IEEE T-WCOM 25$^{th}$ most popular article in June 2017)**

2.24 H. Agrawal, R. Puhl, C. Studer, and A. Babakhani, "Ultra-Wideband Joint Spatial Coding for Secure Communication and High-Resolution Imaging," IEEE Transactions on Microwave Theory and Techniques, Vol. 65, No. 7, pp. 2525–2535, Feb. 2017

2.25 *O. Castañeda, T. Goldstein, and C. Studer, "Data Detection in Large Multi-Antenna Wireless Systems via Approximate Semidefinite Relaxation," IEEE Transactions on Circuits and Systems I, Vol. 64, No. 12, Dec. 2016, **(invited; acceptance rate 3.3% of all presented ISCAS papers)**

2.26 *M. Wu, C. Dick, J. R. Cavallaro, and C. Studer, "High-Throughput Data Detection for Massive MU-MIMO-OFDM using Coordinate Descent," IEEE Transactions on Circuits and Systems I, Vol. 64, No. 12, Dec. 2016, **(invited; acceptance rate 3.3% of all ISCAS papers; IEEE Xplore 19$^{th}$ most popular paper in Dec. 2016)**

2.27 C. Studer and G. Durisi, "Quantized MU-MIMO-OFDM Uplink," IEEE Transactions on Communications, Vol. 64, No. 6, pp. 2387-2399, Apr. 2016

2.28 A. Sankaranarayanan, L. Xu, C. Studer, Y. Li, K. F. Kelly, and R. G. Baraniuk, "Video Compressive Sensing for Spatial Multiplexing Cameras using Motion-Flow Models," SIAM Journal of Imaging Sciences, Vol. 8 No. 3, pp. 1489–1518, July 2015

2.29 M. Wu, Bei Yin, G. Wang, C. Studer, and J. R. Cavallaro, "GPU Acceleration of a Configurable *N*-Way MIMO Detector for Wireless Systems," Journal of Signal Processing Systems, Vol. 76, No. 2, pp. 95–108, Apr. 2014

2.30 A. S. Lan, A. E. Waters, C. Studer, and R. G. Baraniuk, "Sparse Factor Analysis for Learning and Content Analytics," Journal of Machine Learning Research, Vol. 15, pp. 1959–2008, June, 2014

2.31 *M. Wu, Bei Yin, G. Wang, C. Dick, J. R. Cavallaro, and C. Studer, "Large-Scale MIMO Detection for 3GPP LTE: Algorithm and FPGA Implementation," IEEE Journal of Selected Topics in Signal Processing, Vol. 8, No. 5, pp. 916–929, Oct. 2014 **(in the top 50 of the most popular articles in IEEE JSTSP from May to Nov. 2017)**

2.32 A. E. Waters, C. Studer, and R. G. Baraniuk, "Collaboration-Type Identification in Educational Datasets," Journal of Educational Data Mining, Vol. 6. No. 1, pp. 28–52, July 2014

2.33 *C. Studer and R. G. Baraniuk, "Stable Restoration and Separation of Approximately Sparse Signals," Applied and Computational Harmonic Analysis, Vol. 37, pp. 12-32, July 2014

2.34 D. Bellasi, L. Bettini, C. Benkeser, T. Burger, Q. Huang, and C. Studer, "Monolithic Compressive-Sensing Wideband Analog-to-Information Converter," IEEE Journal on Emerging and Selected Topics in Circuits and Systems, Vol. 3, No. 4, pp. 552–565, Dec. 2013

2.35 G. Pope, A. Bracher, and C. Studer, "Probabilistic Recovery Guarantees for Sparsely Corrupted Signals," IEEE Transactions on Information Theory, Vol. 59, No. 5, pp. 3104–3116, May 2013

2.36 C. Studer and E. G. Larsson, "PAR-Aware Large-Scale Multi-User MIMO-OFDM Downlink," IEEE Journal on Selected Areas in Communications, Vol. 31, No. 2, pp. 303–313, Feb. 2013

2.37 C. Studer, S. Fateh, C. Benkeser, and Q. Huang, "Implementation Trade-offs of Soft-Input Soft-Output MAP Decoders for Convolutional Codes," IEEE Transactions on Circuits and Systems I, Vol. 59 , No. 11, pp. 2774– 2783, Nov. 2012

2.38 P. Maechler, C. Studer, D. Bellasi, A. Maleki, A. Burg, N. Felber, H. Kaeslin, and R. G. Baraniuk, "VLSI Design of Approximate Message Passing for Signal Restoration and Compressive Sensing," IEEE Journal on Emerging and Selected Topics in Circuits and Systems, Vol. 2, No. 3, pp. 579–590, Oct. 2012 **(IEEE JETCAS 9$^{th}$ most popular article in 2016)**

2.39 C. Studer, P. Kuppinger, G. Pope, and H. Bölcskei, "Recovery of Sparsely Corrupted Signals," IEEE Transactions on Information Theory, Vol. 58, No. 5, pp. 3115–3130, May 2012

2.40 D. Seethaler, J. Jaldén, C. Studer, and H. Bölcskei, "On the Complexity Distribution of Sphere-Decoding," IEEE Transactions on Information Theory, Vol. 57, No. 9, pp. 5754–5768, Sept. 2011

2.41 C. Studer, S. Fateh, and D. Seethaler, "ASIC Implementation of Soft-Input Soft-Output MIMO Detection Using Parallel Interference Cancellation," IEEE Journal of Solid-State Circuits, Vol. 46, No. 7, pp. 1754–1765, July 2011 **(invited paper; IEEE JSSC 20$^{th}$ most cited article in 2016)**

2.42 C. Studer, C. Benkeser, S. Belfanti, and Q. Huang, "Design and Implementation of a Parallel Turbo-Decoder ASIC for 3GPP-LTE," IEEE Journal of Solid-State Circuits, Vol. 46, No. 1, pp. 8–17, Jan. 2011 **(invited paper; IEEE JSSC 19$^{th}$ most popular paper 2011; 25$^{th}$ most popular article in 2016)**

2.43 C. Studer and H. Bölcskei, "Soft-Input Soft-Output Single Tree-Search Sphere Decoding," IEEE Transactions on Information Theory, Vol. 56, No. 10, pp. 4827–4842, Oct. 2010

2.44 C. Studer, A. Burg, and H. Bölcskei, "Soft-Output Sphere Decoding: Algorithms and VLSI Implementation," IEEE Journal on Selected Areas in Communications, Vol. 26, No. 2, pp. 290–300, Feb. 2008 **(since 2012, the STS-SD algorithm proposed in this paper is part of MATLAB's Communications System Toolbox)**

## 3. Conference Publications

Representative papers marked with an asterisk $^\star$

3.1 E. Lei, O. Castañeda, O. Tirkkonen, T. Goldstein, and C. Studer, "Siamese Neural Networks for Wireless Positioning and Channel Charting," Proc. 57th Annual Allerton Conference on Communication, Control, and Computing, Sep. 2019

3.2 C. Zhu, W. R. Huang, A. Shafahi, H. Li, G. Taylor, C. Studer, and T. Goldstein "Transferable Clean-Label Poisoning Attacks on Deep Neural Nets," arXiv preprint: 1905.05897, May 2019, *submitted*

3.3 O. Castañeda, M. Bobbett, A. Gallyas-Sanhueza, and C. Studer, "PPAC: A Versatile In-Memory Accelerator for Matrix-Vector-Product-Like Operations," 30th IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP), July 2019, *to appear*, **(invited paper)**

3.4 R. Ghods, A. Gallyas-Sanhueza, S. H. Mirfarshbafan, and C. Studer, "BEACHES: Beamspace Channel Estimation for Multi-Antenna mmWave Systems and Beyond," 20th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), July 2019, *to appear*, **(invited paper)**

3.5 P. Huang, O. Castañeda, E. Gönültaş, S. Medjkouh, O. Tirkkonen, T. Goldstein, and C. Studer, "Improving Channel Charting with Representation-Constrained Autoencoders," 20th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), July 2019, *to appear*, **(invited paper)**

3.6 S. Jacobsson, C. Lindquist, G. Durisi, T. Eriksson, and C. Studer, "Timing and Frequency Synchronization for 1-bit Massive MU-MIMO-OFDM Downlink," 20th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), July 2019, *to appear*

3.7 A. Balatsoukas-Stimming, O. Castañeda, S. Jacobsson, G. Durisi, and C. Studer, "Neural-Network Optimized 1-bit Precoding for Massive MU-MIMO," 20th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), July 2019, *to appear*

3.8 C. Zhu, W. R. Huang, H. Li, G. Taylor, C. Studer, and T. Goldstein, "Blackbox Clean-Label Poisoning Attacks on Neural Networks," 36th International Conference on Machine Learning (ICML), June 2019, *to appear*

3.9 T. Yang, R. Baker, C. Studer, N. Heffernan, and A. S. Lan, "Active Learning for Student Affect Detection," International Conference on Educational Data Mining (EDM), July 2019, *to appear*

3.10 K. Li, O. Castañeda, C. Jeon, J. R. Cavallaro, and C. Studer, "Decentralized Coordinate-Descent Data Detection and Precoding for Massive MU-MIMO," IEEE International Symposium on Circuits and Systems, May 2019, *to appear*

3.11 S. Medjkouh, E. Gönültaş, T. Goldstein, O. Tirkkonen, and C. Studer, "Unsupervised Charting of Wireless Channels," IEEE Global Communications Conference (GLOBECOM), Dec. 2018

3.12 H. Li, Z. Xu, G. Taylor, C. Studer, and T. Goldstein, "Visualizing the Loss Landscape of Neural Nets," 32nd Conference on Neural Information Processing Systems (NeurIPS), Dec. 2018

3.13 A. Shafahi, W. R. Huang, M. Najini, O. Suciu, C. Studer, and T. Goldstein, "Poison Frogs! Targeted Clean-Label Poisoning Attacks on Neural Networks," 32nd Conference on Neural Information Processing Systems (NeurIPS), Dec. 2018

3.14 *K. Li, C. Jeon, J. R. Cavallaro, and C. Studer, "Feedforward Architectures for Decentralized Precoding in Massive MU-MIMO Systems," Asilomar Conference on Signals, Systems, and Computers, Oct. 2018 **(2nd place in student best paper competition)**

3.15 S. Jacobsson, U. Gustavsson, G. Durisi, and C. Studer, "Massive MU-MIMO-OFDM Uplink with Hardware Impairments: Modeling and Analysis," Asilomar Conference on Signals, Systems, and Computers, Oct. 2018

3.16 J. Deng, S. Medjkouh, N. Malm, O. Tirkkonen, and C. Studer, "Multipoint Channel Charting for Wireless Networks," Asilomar Conference on Signals, Systems, and Computers, Oct. 2018, **(invited paper)**

3.17 *R. Ghods, A. S. Lan, T. Goldstein, and C. Studer, "Linear Spectral Estimators and an Application to Phase Retrieval," 35th International Conference on Machine Learning (ICML), July 2018

3.18 A. S. Lan, M. Chiang, and C. Studer, "An Estimation and Analysis Framework for the Rasch Model," 35th International Conference on Machine Learning (ICML), July 2018

3.19 J. Deng, O. Tirkkonen, and C. Studer, "MmWave Channel Estimation via Atomic Norm Minimization for Multi-User Hybrid Precoding," IEEE Wireless Communications and Networking Conference (WCNC), April 2018

3.20 O. Castañeda, S. Jacobsson, G. Durisi, T. Goldstein, and C. Studer, "VLSI Design of a 3-bit Constant-Modulus Precoder for Massive MU-MIMO," IEEE International Symposium on Circuits and Systems (ISCAS), May 2018

3.21 S. Jacobsson, W. Xu, G. Durisi, and C. Studer, "MSE Optimal 1-bit Precoding for Multiuser MIMO Via Branch-and-Bound," IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), April. 2018

3.22 S. Jacobsson, G. Durisi, M. Coldrey, and C. Studer, "Massive Multiuser MIMO Downlink with Low-Resolution Converters," International Zurich Seminar on Information and Communication (IZS), Feb. 2018, **(invited paper)**

3.23 A. S. Lan, M. Chiang, and C. Studer, "Linearized Binary Regression," 52th Annual Conference on Information Sciences and Systems (CISS), Mar. 2018

3.24 R. Ghods, A. S. Lan, T. Goldstein, and C. Studer, "PhaseLin: Linear Phase Retrieval," 52th Annual Conference on Information Sciences and Systems (CISS), Mar. 2018

3.25 S. Jacobsson, G. Durisi, M. Coldrey, and C. Studer, "Massive MU-MIMO-OFDM Downlink with One-Bit DACs and Linear Precoding," Proc. IEEE Global Communications Conference (GLOBECOM), Dec. 2017

3.26 H. Li, S. De, Z. Xu, C. Studer, H. Samet, and T. Goldstein, "Training Quantized Nets: A Deeper Understanding," Neural Information Processing Systems (NIPS), Dec. 2017

3.27 C. Jeon, G. Mirza, R. Ghods, A. Maleki, C. Studer, "VLSI Design of a Nonparametric Equalizer for Massive MU-MIMO," Asilomar Conference on Signals, Systems, and Computers, Nov. 2017, **(invited paper)**

3.28 S. Jacobsson, G. Durisi, M. Coldrey, and C. Studer, "On Out-of-Band Emissions of Quantized Precoding in Massive MU-MIMO-OFDM," Asilomar Conference on Signals, Systems, and Computers, Nov. 2017, **(invited paper)**

3.29 K. Li, C. Jeon, J. R. Cavallaro, and C. Studer, "Decentralized Equalization for Massive MU-MIMO on FPGA," Asilomar Conference on Signals, Systems, and Computers, Nov. 2017, **(invited paper)**

3.30 T. Goldstein and C. Studer, "Convex Phase Retrieval without Lifting via PhaseMax," 24th International Conference on Machine Learning (ICML), Aug. 2017

3.31 Z. Xu, M. A. T. Figueiredo, X. Yuan, C. Studer, and T. Goldstein, "Adaptive Relaxed ADMM: Convergence Theory and Practical Implementation," Conference on Computer Vision and Pattern Recognition (CVPR), July 2017

3.32 *C. Jeon, K. Li, J. R. Cavallaro, and C. Studer, "On the Achievable Rates of Decentralized Equalization in Massive MU-MIMO Systems," Proc. IEEE International Symposium on Information Theory (ISIT), June 2017

3.33 *R. Ghods, C. Jeon, G. Mirza, A. Maleki, and C. Studer, "Optimally-Tuned Nonparametric Linear Equalization for Massive MU-MIMO Systems," Proc. IEEE International Symposium on Information Theory (ISIT), June 2017

3.34 O. Castañeda, T. Goldstein, and C. Studer, "FPGA Design of Low-Complexity Joint Channel Estimation and Data Detection for Large SIMO Wireless Systems," IEEE International Symposium on Circuits and Systems (ISCAS), May 2017

3.35 S. Shahabuddin, M. Juntti, and C. Studer, "ADMM-based Infinity Norm Detection for Large MU-MIMO: Algorithm and VLSI Architecture," IEEE International Symposium on Circuits and Systems (ISCAS), May 2017

3.36 O. Tirkkonen and C. Studer, "Subset-Codebook Precoding for 1-bit Massive Multiuser MIMO," Conference on Information Sciences and Systems (CISS), Mar. 2017

3.37 O. Castañeda, T. Goldstein, and C. Studer, "POKEMON: A Non-Linear Beamforming Algorithm for 1-bit Massive MIMO," IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Mar. 2017

3.38 I. Labutov and C. Studer, "JAG: Joint Assessment and Grading," 31st AAAI Conference on Artificial Intelligence, Feb. 2017

3.39 K. Li, R. Sharan, Y. Chen, T. Goldstein, J. R. Cavallaro, and C. Studer "Decentralized Beamforming for Massive MU-MIMO on a GPU Cluster," 4th IEEE Global Conference on Signal and Information Processing (GlobalSIP), Dec. 2016

3.40 S. Jacobsson, G. Durisi, M. Coldrey, T. Goldstein, and C. Studer, "Non-Linear 1-Bit Precoding for Massive MU-MIMO with Higher-Order Modulation," Asilomar Conference on Signals, Systems, and Computers, Nov. 2016 **(invited paper)**

3.41 K. Li, R. Sharan, Y. Chen, J. R. Cavallaro, and C. Studer "Decentralized Data Detection for Massive MU-MIMO on a Xeon PI," Asilomar Conference on Signals, Systems, and Computers, Nov. 2016 **(invited paper)**

3.42 S. Shah, A. Kumar, D. Jacobs, C. Studer, and T. Goldstein, "Biconvex Relaxation for Semidefinite Programming in Computer Vision," 14th European Conference on Computer Vision (ECCV), Oct. 2016

3.43 D. Vats, A. S. Lan, C. Studer, and R. G. Baraniuk, "Optimal Ranking of Test Items using the Rasch Model," Proc. 51th Annual Allerton Conference on Communication, Control, and Computing, Sep. 2016

3.44 I. Labutov, H. Lipson, and C. Studer, "Optimally Discriminative Choice Sets in Discrete Choice Models: Application to Data-Driven Test Design," 22nd ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), Aug. 2016

3.45 *C. Jeon, A. Maleki, and C. Studer, "On the Performance of Mismatched Data Detection in Large MIMO Systems," Proc. IEEE International Symposium on Information Theory (ISIT), July 2016

3.46 *I. Labutov and C. Studer, "Calibrated Self Assessment," International Conference on Educational Data Mining (EDM), June 2016, **(best student paper award)**

3.47 A. S. Lan, T. Goldstein, R. G. Baraniuk, and C. Studer, "Dealbreaker: A Nonlinear Latent Variable Model for Educational Data," International Conference on Machine Learning (ICML), Jun. 2016

3.48 S. Shah, T. Goldstein, and C. Studer "Estimating Sparse Signals with Smooth Support via Convex Programming and Block Sparsity," IEEE Conference on Computer Vision and Pattern Recognition (CVPR), June 2016

3.49 M. Wu, C. Dick, J. R. Cavallaro, and C. Studer, "FPGA Design of a Coordinate Descent Data Detector for Large-Scale MU-MIMO," IEEE International Symposium on Circuits and Systems (ISCAS), May 2016

3.50 O. Castañeda, T. Goldstein, and C. Studer, "FPGA Design of Approximate Semidefinite Relaxation for Data Detection in Large MIMO Wireless Systems," IEEE International Symposium on Circuits and Systems (ISCAS), May 2016

3.51 I. Labutov, K. Luu, H. Lipson, and C. Studer, "Optimally Discriminative Choice Sets in Discrete Choice Models: Application to Data-Driven Test Design," L@S: Third Annual ACM Conference on Learning at Scale, Apr. 2016

3.52 N. E. Tunali, M. Wu, C. Dick, and C. Studer, "Linear Large-Scale MIMO Data Detection for 5G Multi-Carrier Waveform Candidates," Asilomar Conference on Signals, Systems, and Computers, Nov. 2015 **(invited paper)**

3.53 K. Li, B. Yin, M. Wu, J. R. Cavallaro, and C. Studer, "Accelerating Massive MIMO Uplink Detection on GPU for SDR Systems," IEEE Dallas Circuits and Systems Conference, Oct. 2015

3.54 R. Ghods, C. Jeon, A. Maleki, and C. Studer, "Optimal Large-MIMO Data Detection with Transmit Impairments," Proc. 50th Annual Allerton Conference on Communication, Control, and Computing, Sep. 2015

3.55 *C. Jeon, R. Ghods, A. Maleki, and C. Studer, "Optimality of Large MIMO Detection via Approximate Message Passing," Proc. IEEE International Symposium on Information Theory (ISIT), June 2015

3.56 S. Jacobson, G. Durisi, M. Coldrey, U. Gustavsson, and C. Studer, "One-Bit Massive MIMO: Channel Estimation and High-Order Modulations," Proc. IEEE International Conference on Communications (ICC), June 2015

3.57 B. Yin, M. Wu, J. R. Cavallaro, and C. Studer, "VLSI design of large-scale soft-output MIMO detection using conjugate gradients," Proc. IEEE International Symposium on Circuits and Systems (ISCAS), May 2015

3.58 C. Roth, C. Studer, G. Karakonstantis, and A. Burg, "Statistical Data Correction for Unreliable Memories," Proc. Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, Nov. 2014

3.59 B. Yin, M. Wu, J. R. Cavallaro, and C. Studer, "Conjugate Gradient-based Soft-Output Detection and Precoding in Massive MIMO Systems," Proc. IEEE Global Communications Conference (GLOBECOM), Dec. 2014

3.60 M. Wu, C. Dick, J. R. Cavallaro, and C. Studer, "Iterative Detection and Decoding in 3GPP LTE-based Massive MIMO Systems," 22nd European Signal Processing Conference (EUSIPCO), Sept. 2014 **(invited paper)**

3.61 D. Bellasi, L. Bettini, C. Benkeser, T. Burger, Q. Huang, and C. Studer, "Compressive Sensing Spectrum Recovery from Quantized Measurements in 28 nm SOI CMOS," 22nd European Signal Processing Conference (EUSIPCO), Sep. 2014

3.62 D. Bellasi, L. Bettini, C. Benkeser, T. Burger, Q. Huang, and C. Studer, "A 1.9 GS/s 4-bit Sub-Nyquist Flash ADC for 3.8 GHz Compressive Spectrum Sensing in 28 nm CMOS," Midwest Symposium on Circuits and Systems (MWSCAS), Aug. 2014

3.63 A. S. Lan, C. Studer, and R. G. Baraniuk, "Time-Varying Learning and Content Analytics via Sparse Factor Analysis," 20th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, Aug. 2014

3.64 A. S. Lan, C. Studer, and R. G. Baraniuk, "Quantized Matrix Completion for Personalized Learning," Proc. 7th International Conference on Educational Data Mining (EDM), July 2014

3.65 B. Yin, M. Wu, G. Wang, C. Dick, J. R. Cavallaro, and C. Studer, "A 3.8 Gb/s Large-Scale MIMO Detector for 3GPP LTE-Advanced," Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2014

3.66 A. S. Lan, C. Studer, and R. G. Baraniuk, "Matrix Recovery from Quantized and Corrupted Measurements," Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2014

3.67 A. E. Waters, C. Studer, and R. G. Baraniuk, "Bayesian Pairwise Collaboration Detection in Educational Datasets," 1$^{st}$ IEEE Global Conference on Signal and Information Processing (GlobalSIP), Austin, TX, USA, Dec. 2013 **(invited paper)**

3.68 B. Yin, M. Wu, C. Studer, and J. R. Cavallaro, "Full-Duplex in Large-Scale Wireless Systems," Proc. Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, Nov. 2013

3.69 M. Wu, G. Wang, B. Yin, C. Studer, and J. R. Cavallaro, "HSPA+/LTE-A Turbo Decoder on GPU and Multicore CPU," Proc. Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, Nov. 2013

3.70 E. L. Dyer, C. Studer, J. T. Robinson, and R. G. Baraniuk, "A Robust and Efficient Method to Recover Neural Events from Noisy and Corrupted Data," Proc. 6th International IEEE EMBS Neural Engineering Conference, San Diego, CA, Nov., 2013

3.71 C. Studer, G. Pope, P. Navarro, and R. G. Baraniuk, "Recovering Sparse Low-rank Blocks in Tandem Mass Spectrometry," Proc. 50th Annual Allerton Conference on Communication, Control, and Computing, Monticello, IL, USA, Oct. 2013

3.72 D. Vats, C. Studer, A. S. Lan, L. Carin, and R. G. Baraniuk, "Test-size Reduction for Concept Estimation," Proc. 6th International Conference on Educational Data Mining (EDM), Memphis, TN, July 2013

3.73 A. S. Lan, C. Studer, A. E. Waters, and R. G. Baraniuk, "Joint Topic Modeling and Factor Analysis of Textual Information and Graded Response Data," Proc. 6th International Conference on Educational Data Mining (EDM), Memphis, TN, July 2013

3.74 A. S. Lan, C. Studer, A. E. Waters, and R. G. Baraniuk, "Tag-Aware Ordinal Sparse Factor Analysis for Learning and Content Analytics," Proc. 6th International Conference on Educational Data Mining (EDM), Memphis, TN, July 2013

3.75 D. Vats, C. Studer, and R. G. Baraniuk, "Test-size Reduction Using Sparse Factor Analysis," Proc. 10th International Conference on Sampling Theory and Applications (SampTA), Bremen, Germany, July 2013

3.76 G. Pope, C. Aubel, and C. Studer, "Learning Phase-Invariant Dictionaries," Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Vancouver, BC, July 2013

3.77 E. L. Dyer, C. Studer, and R. G. Baraniuk, "Subspace Clustering with Dense Representations," Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Vancouver, BC, July 2013

3.78 B. Yin, M. Wu, C. Studer, J. R. Cavallaro, and C. Dick, "Implementation Trade-offs for Linear Detection in Large-Scale MIMO Systems," Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Vancouver, BC, July 2013

3.79 G. Pope, M. Lerjen, S. Müllener, S. Schläpfer, T. Walti, J. Widmer, and C. Studer, "Light Curtain Localization via Compressive Sensing," Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Vancouver, BC, July 2013

3.80 A. Lan, A. E. Waters, and C. Studer, "Sparse Probit Factor Analysis for Learning Analytics," Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Vancouver, BC, July 2013, **(invited paper)**

3.81 L. Xu, A. Sankaranarayanan, C. Studer, Y. Li, R. G. Baraniuk, and K. F. Kelly, "Multi-Scale Compressive Video Acquisition," Proc. Computational Optical Sensing and Imaging, Arlington VA, June 2013

3.82 M. Wu, Bei Yin, A. Vosoughi, C. Studer, and J. Cavallaro, "Approximate Matrix Inversion for High-Throughput Data Detection in the Large-Scale MIMO Uplink," Proc. IEEE International Symposium on Circuits and Systems (ISCAS), Beijing, China, May 2013

3.83 P. Maechler, D. Bellasi, A. Burg, N. Felber, H. Kaeslin, and C. Studer, "Sparsity-Based Real-Time Audio Restoration," Proc. Conference on Design & Architectures for Signal & Image Processing (DASIP), Karlsruhe, Germany, Oct. 2012

3.84 N. Preyss, A. Burg, and C. Studer "Layered Detection and Decoding in MIMO Wireless Systems", Proc. Conference on Design & Architectures for Signal & Image Processing (DASIP), Karlsruhe, Germany, Oct. 2012 **(invited paper)**

3.85 C. Studer, W. Yin, and R. G. Baraniuk, "Signal Representations with Minimum $\ell_\infty$-Norm," Proc. 50th Annual Allerton Conference on Communication, Control, and Computing, Monticello, IL, USA, Oct. 2012

3.86 C. Roth, C. Benkeser, C. Studer, G. Karakonstantis, and A. Burg, "Data Mapping for Unreliable Memories," Proc. 50th Annual Allerton Conference on Communication, Control, and Computing, Monticello, IL, USA, Oct. 2012 **(invited paper)**

3.87 A. Bracher, G. Pope, and C. Studer, "Coherence-Based Probabilistic Recovery Guarantees for Sparsely Corrupted Signals," IEEE Information Theory Workshop (ITW), Lausanne, Switzerland, Sep. 2012

3.88 C. Studer and E. G. Larsson, "PAR-Aware Multi-user Pre-coder for the Large-Scale MIMO-OFDM Downlink," Proc. IEEE 9th International Symposium on Wireless Communication Systems (ISWCS), Paris, France, Aug. 2012 **(invited paper)**

3.89 C. Aubel, C. Studer, G. Pope, and H. Bölcskei, "Separation of Signals Sparsified by Morphologically Different Redundant Transforms," Proc. IEEE International Symposium on Information Theory, Cambridge, MA, USA, July. 2012

3.90 A. Sankaranarayanan, C. Studer, and R. G. Baraniuk, "CS-MUVI: Video Compressive Sensing for Spatial-Multiplexing Cameras," Proc. IEEE International Conference on Computational Photography (ICCP), Seattle, WA, USA, Apr. 2012

3.91 C. Studer and R. G. Baraniuk, "Dictionary Learning from Sparsely Corrupted or Compressed Signals," Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Kyoto, Japan, Mar. 2012

3.92 G. Pope, C. Studer, and M. Baes, "Coherence-based Recovery Guarantees for Generalized Basis-Pursuit De-Quantizing," Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Kyoto, Japan, Mar. 2012

3.93 G. Pope, M. Baumann, C. Studer, and G. Durisi, "Real-Time Principal Component Pursuit," Proc. 45th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, Nov. 2011

3.94 C. Studer and R. G. Baraniuk, "Recovery Guarantees for Restoration and Separation of Approximately Sparse Signals," Proc. 49th Annual Allerton Conference on Communication, Control, and Computing, Monticello, IL, USA, pp. 736–743, Sept. 2011

3.95 C. Studer, P. Kuppinger, G. Pope, and H. Bölcskei, "Sparse Signal Recovery from Sparsely Corrupted Measurements," Proc. IEEE International Symposium on Information Theory, St. Petersburg, Russia, pp. 1422–1426, Aug. 2011

3.96 C. Studer, M. Wenk, and A. Burg, "System-Level Implications of Residual Transmit-RF Impairments in MIMO Systems," Proc. IEEE 4th European Conference on Antennas and Propagation (EUCAP), Rome, Italy, pp. 2686–2689, Apr. 2011 **(invited paper)**

3.97 C. Roth, A. Cevrero, C. Studer, Y. Leblebici, and A. Burg, "Area, Throughput, and Energy-Efficiency Trade-offs in the VLSI Implementation of LDPC Decoders," Proc. IEEE International Symposium on Circuits and Systems (ISCAS), Rio de Janeiro, Brazil, pp. 1772–1775, May 2011 **(invited paper)**

3.98 C. Roth, P. Meinerzhagen, C. Studer, and A. Burg, "A 15.8 pJ/bit/iter Quasi-Cyclic LDPC Decoder for IEEE 802.11n in 90 nm CMOS," Proc. IEEE Asian Solid-State Circuit Conference (A-SSCC), Beijing, China, pp. 1–4, Nov. 2010

3.99 C. Novak, C. Studer, A. Burg, and G. Matz, "The Effect of Unreliable LLR Storage on the Performance of MIMO-BICM," Proc. 44th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, pp. 736–740, Sept. 2010

3.100 M. Wenk, L. Bruderer, A. Burg, and C. Studer, "Area- and Throughput-Optimized VLSI Architecture of Sphere Decoding," Proc. IEEE/IFIP International Conference on VLSI and System-on-Chip (VLSI-SoC), Madrid, Spain, pp. 189–194, Sept. 2010

3.101 C. Studer, S. Fateh, and D. Seethaler, "A 757 Mb/s 1.5 mm$^2$ 90 nm CMOS Soft-Input Soft-Output MIMO Detector for IEEE 802.11n," Proc. IEEE European Solid State Circuits Conference (ESSCIRC), Seville, Spain, pp. 520–533, Sept. 2010

3.102 L. Bruderer, C. Studer, M. Wenk, D. Seethaler, and A. Burg, "VLSI Implementation of a Low-Complexity LLL Lattice Reduction Algorithm for MIMO Detection," Proc. IEEE International Symposium on Circuits and Systems (ISCAS), Paris, France, pp. 3745–3748, May 2010

3.103 B. Zimmermann and C. Studer, "FPGA-based Real-Time Acoustic Camera Prototype," Proc. IEEE International Symposium on Circuits and Systems (ISCAS), Paris, France, pp. 1419-1421, May 2010

3.104 C. Studer, M. Wenk, and A. Burg, "MIMO Transmission with Residual Transmit-RF Impairments," Proc. International ITG Workshop on Smart Antennas (WSA), Bremen, Germany, pp. 189–196, Feb. 2010

3.105 C. Studer, C. Benkeser, S. Belfanti, and Q. Huang, "A 390 Mb/s 3.57 mm$^2$ 3GPP-LTE Turbo Decoder ASIC in 0.13 µm CMOS," Dig. Techn. Papers, IEEE International Solid-State Circuits Conference (ISSCC), San Francisco, CA, USA, pp. 274–275, Feb. 2010

3.106 D. Seethaler, J. Jaldén, C. Studer and H. Bölcskei, "Tail Behavior of Sphere-Decoding Complexity in Random Lattices," Proc. IEEE International Symposium on Information Theory (ISIT), Seoul, Korea, pp. 729–733, June 2009

3.107 C. Studer, D. Seethaler, and H. Bölcskei, "Finite Lattice-Size Effects in MIMO Detection," Proc. 42th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, pp. 2032–2037, Oct. 2008 **(invited paper)**

3.108 C. Studer, N. Preyss, C. Roth, and A. Burg, "Configurable High-Throughput Decoder Architecture for Quasi-Cyclic LDPC Codes," Proc. 42th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, pp. 1137–1142, Oct. 2008 **(invited paper)**

3.109 P. Luethi, C. Studer, S. Duetsch, E. Zgraggen, H. Kaeslin, N. Felber, and W. Fichtner, "Gram-Schmidt-Based QR Decomposition for MIMO Detection: VLSI Implementation and Comparison," Proc. IEEE Asia Pacific Conference on Circuits and Systems (APCCAS), Macao, China, pp. 830–833, Nov. 2008

3.110 C. Studer and H. Bölcskei, "Soft-Input Soft-Output Sphere Decoding," Proc. IEEE International Symposium on Information Theory (ISIT), Toronto, Canada, pp. 2007–2011, July 2008

3.111 C. Studer, P. Luethi, and W. Fichtner, "VLSI Architecture for Data-Reduced Steering Matrix Feedback in MIMO Systems," Proc. IEEE International Symposium on Circuits and Systems (ISCAS), Seattle, WA, USA, pp. 300–303, May 2008 **(best student paper award)**

3.112 C. Senning, C. Studer, P. Luethi, and W. Fichtner, "Hardware-Efficient Steering Matrix Computation Architecture for MIMO Communication Systems," Proc. IEEE International Symposium on Circuits and Systems (ISCAS), Seattle, WA, USA, pp. 304–307, May 2008

3.113 C. Studer, P. Blösch, P. Friedli, and A. Burg, "Matrix Decomposition Architecture for MIMO Systems: Design and Implementation Trade-Offs," Proc. 41th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, pp. 1986–1990, Nov. 2007 **(invited paper; 1st place at student paper contest)**

3.114 D. Perels, C. Studer, and W. Fichtner, "Implementation of a Low-Complexity Frame-Start Detection Algorithm for MIMO Systems," Proc. IEEE International Symposium on Circuits and Systems (ISCAS), New Orleans, LA, USA, pp. 1903-1906, May 2007

3.115 C. Hess, M. Wenk, A. Burg, P. Luethi, C. Studer, N. Felber, and W. Fichtner, "Reduced-Complexity MIMO Detector with Close-to ML Error Rate Performance," Proc. ACM Great Lakes Symposium on VLSI, Stresa, Italy, pp. 200–203, Mar. 2007

3.116 M. Wenk, A. Burg, M. Zellweger, C. Studer, and W. Fichtner, "VLSI Implementation of the List Sphere Algorithm," Proc. 24th NORCHIP Conference, Linköping, Sweden, pp. 107–110, Nov. 2006

3.117 C. Studer, M. Wenk, A. Burg, and H. Bölcskei, "Soft-Output Sphere Decoding: Performance and Implementation Aspects," Proc. 40th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, pp. 2071–2076, Oct. 2006 **(invited paper)**

3.118 C. Studer, A. Burg, and W. Fichtner, "A Unification of ML-Optimal Tree-Search Decoders," Proc. 40th Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, pp. 2185–2189, Oct. 2006

3.119 A. Burg, M. Borgmann, M. Wenk, C. Studer, and H. Bölcskei, "Advanced Receiver Algorithms for MIMO Wireless Communications," Proc. Design Automation and Test Europe Conference (DATE), pp. 593–598, Mar. 2006 **(invited paper)**

## 4. Theses

4.1 C. Studer, "Iterative MIMO Decoding: Algorithm and VLSI Implementation Aspects," Ph.D. dissertation, Department of Information Technology and Electrical Engineering, ETH Zurich, Zurich, Switzerland, Series in Microelectronics, Vol. 202, Hartung-Gorre Verlag Konstanz, July 2009 **(ETH Medal for doctoral dissertation)**

4.2 C. Studer, "Sphere Decoding with Resource Constraints," M.S. Thesis, Department of Information Technology and Electrical Engineering, ETH Zurich, Zurich, Switzerland, Oct. 2005 **(ETH Medal for M.S. Thesis)**

## 5. Press

5.1 Rice University News & Media, "Rice Technology Licensed by Siemens Healthineers Enhances MRI Scans," Oct. 2017, website: http://news.rice.edu/2017/10/24/rice-technology-licensed-by-siemens-healthineers-enhances-mri-scans-2/

5.2 Inside R&D Alert, "Algorithms Recover Damaged Signals," Frost & Sullivan, Oct. 2014

5.3 Projects Magazine on Science, Technology, and Innovation, "Sparse Signal Recovery: Novel ways of restoring damaged signals," Insight Publishers Ltd, No. 31, Apr. 2013

## 6. Live Demonstrations, Workshop Papers, and Extended Abstracts

6.1 S. Jacobsson, Y. Ettefagh, G. Durisi, and C. Studer, "All-Digital Massive MIMO with a Fronthaul Constraint," IEEE Statistical Signal Processing Workshop (SSP), June 2018, **(invited)**

6.2 H. Li, S. De, Z. Xu, C. Studer, H. Samet, and T. Goldstein, "Towards a Deeper Understanding of Training Quantized Neural Networks," ICML 2017 Workshop on Principled Approaches to Deep Learning (PADL), July 2017 **(Google Student Best Paper Award)**

6.3 M. Pelissier and C. Studer, "NUWBS: Non-Uniform Wavelet Bandpass Sampling for Compressive RF Feature Acquisition," Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop, June 2017

6.4 T. Goldstein and C. Studer, "PhaseMax: Convex Phase Retrieval Without Lifting," Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop, June 2017

6.5 Z. Xu, S. De, M. A. T. Figueiredo, C. Studer, and T. Goldstein, "An Empirical Study of ADMM for Nonconvex Problems," Neural Information Processing Systems (NIPS), in Workshop on Nonconvex Optimization for Machine Learning: Theory and Practice, Barcelona, Spain, Dec. 2016

6.6 I. Labutov and C. Studer, "Work-in-progress: Simultaneous Generation and Assessment of Content," 4th AAAI Conference on Human Computation and Crowdsourcing (HCOMP), Oct. 2016

6.7 I. Labutov and C. Studer, "Joint Assessment and Grading," International Conference on Machine Learning (ICML), Machine Learning for Digital Education Workshop, June 2016

6.8 A. S. Lan, T. Goldstein, C. Studer, and R. G. Baraniuk, "Modeling Student Responses Using the Dealbreaker Model," International Conference on Machine Learning (ICML) Workshop on Machine Learning for Education, July 2015

6.9 C. Studer, T. Goldstein, W. Yin, and R. G. Baraniuk, "Efficient Algorithms for $\ell_\infty$-Norm Minimization," Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop, July 2015

6.10 C. Studer,"Nullspace Condition, Uncertainty Relation, and Recovery Guarantee for Signals with Low Density," Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop, July 2015

6.11 A. S. Lan, C. Studer, and R. G. Baraniuk, "Self-Expressive Clustering of Binary Data via Group Sparsity," Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop, July 2015

6.12 T. Goldstein, C. Studer, and R. G. Baraniuk, "Forward-Backward Splitting Made FASTA," Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop, July 2015

6.13 E. Dyer, C. Studer, and R. G. Baraniuk, "Subspace Clustering Reloaded: Sparse vs. Dense Representations," Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop, July 2013

6.14 A. Taeb, A. Maleki, C. Studer, and R. G. Baraniuk, "Maximin Analysis of Message Passing Algorithms for Recovering Block Sparse Signals," Signal Processing with Adaptive Sparse Structured Representations (SPARS) Workshop, July 2013

6.15 G. Pope, C. Studer, P. Navarro, and R. G. Baraniuk, "Recovering Sparse Low-rank Blocks in Mass Spectrometry," Signal Processing with Adaptive Sparse Structured Representations (SPARS) workshop, July 2013

6.16 D. Bellasi, P. Maechler, A. Burg, N. Felber, and C. Studer, "Real-Time Audio Restoration using Compressive Sensing," IEEE International Symposium on Circuits and Systems (ISCAS), Beijing, China, May 2013 **(Best Demo Award)**

6.17 A. Lan, A. E. Waters, C. Studer, and R. G. Baraniuk, "Learning Analytics via Sparse Factor Analysis," Neural Information Processing Systems (NIPS), in Personalizing Education with Machine Learning Workshop, Lake Tahoe, NV, Dec. 2012

6.18 A. E. Waters, A. Lan, C. Studer, and R. G. Baraniuk, "Sparse Factor Analysis for Learning Analytics," Neural Information Processing Systems (NIPS), in Deep Learning & Feature Extraction Workshop, Lake Tahoe, NV, Dec. 2012

6.19 J. V. Shi, A. Sankaranarayanan, C. Studer, and R. G. Baraniuk, "Video Compressive Sensing for Dynamic MRI," 21st Annual Computational Neuroscience Meeting (CNS), Atlanta, GA, USA, July 2012

6.20 A. E. Waters, A. Lan, C. Studer, and R. G. Baraniuk, "Sparse Factor Analysis for Cognitive Tutoring," The Learning Workshop, Snowbird, UT, USA, April. 2012

6.21 B. Zimmermann and C. Studer, "FPGA-based Real-Time Acoustic Camera Prototype," IEEE International Symposium on Circuits and Systems (ISCAS), Paris, France, May 2010

## 7. Invited Talks and Poster Presentations

7.1 C. Studer, "Massive MIMO with Low-Precision Data Converters," eWorkshop for Semiconductor Research Council (SRC) JUMP Project, Oct. 2019 **(66 attendees)**

7.2 C. Studer, "Finite-Alphabet Baseband Processing," talk for SRC Annual Executive Review at Intel, Hillsboro, OR, Sep. 2019

7.3 C. Studer, "From Theory to Practice with Hardware-Aware Baseband-Processing Algorithms," talk at Nokia-Bell Labs, Murray Hill, NJ, Aug. 2019

7.4 C. Studer, "From Theory to Practice with Hardware-Aware Signal Processing Algorithms," talk at University California Santa Barbara, CA Mar. 2019

7.5 C. Studer, "From Theory to Practice with Hardware-Aware Signal Processing Algorithms," talk at ETH Zurich, Switzerland, Feb. 2019

7.6 C. Studer, "Unsupervised Charting of Wireless Channels," talk at Xilinx Inc., San Jose, CA, Nov. 2018

7.7 C. Studer, "Unsupervised Charting of Wireless Channels," world-wide webcast talk for Nokia-Bell Labs, Aug. 2018 **(approximately 60 attendees)**

7.8 C. Studer, "On the Achievable Rates of Decentralized Equalization in Massive MU-MIMO Systems," talk at Ericsson AB, Stockholm, Sweden, July 2018

7.9 C. Studer, "Unsupervised Charting of Wireless Channels," talk at Ericsson AB, Göteborg, Sweden, July 2018

7.10 C. Studer, "Massive MU-MIMO for 5G: Practical Challenges and Solutions," talk at IMT Atlantique, Brest, France, Dec. 2017

7.11 C. Studer, "Reliable Communication in Massive MIMO with Low-Precision Converters," IEEE International Workshop on Signal Processing Systems (SIPS), Lorient, France, Oct. 2017 **(keynote speaker)**

7.12 C. Studer, "Massive MU-MIMO for 5G: Practical Challenges and Solutions," talk at Huawei's Strategy and Technology Workshop (STW), Shenzhen, China, May 2017

7.13 C. Studer, "Fast Low-PAR Precoding for Massive MU-MIMO-OFDM (and something else)," talk at Ericsson AB, Göteborg, Sweden, Dec. 2016

7.14 M. Pelissier and C. Studer, "Adaptive Compressive Sensing for Radio-Frequency Receivers," Asilomar Conference on Signals, Systems, and Computers, Nov. 2016

7.15 C. Studer, "Quantized Precoding for Massive MU-MIMO," talk at Syracuse University, Syracuse, NY, Aug. 2016

7.16 C. Studer, "Compressive Sensing Techniques for Massive MIMO," talk at the US Global Strategy Meeting, Huawei, Bridgewater, NJ, June. 2016.

7.17 C. Studer, "Hardware-Aware Data Detection and Precoding in Massive MIMO Systems," talk at Ericsson AB, Göteborg, Sweden, Aug. 2015.

7.18 C. Studer, "Hardware-Aware Data in Massive MIMO Systems," talk at Princeton University, Princeton, NJ, May 2015.

7.19 C. Studer, "Hardware-Aware Data Detection and Precoding in Massive MIMO Systems," talk at Xilinx Inc., San Jose, CA, Nov. 2014.

7.20 C. Studer, "Analog-to-Information Converters: From Applications to Circuits," talk at Qualcomm, San Diego, CA, Nov. 2014.

7.21 C. Studer, "Hardware-Aware Data Detection and Precoding in Massive MIMO Systems," talk at Qualcomm, San Diego, CA, Nov. 2014.

7.22 C. Studer, "Sparse Signal and Image Recovery: Theory, Algorithms, and VLSI Circuits," talk at Rambus Inc., Sunnyvale, CA, Oct. 2014.

7.23 C. Studer, "Analog-to-Information Converters: From Applications to Circuits," talk at University of Massachusetts Amherst, Amherst, Oct. 2014.

7.24 C. Studer, "Analog-to-Information Converters: From Applications to Circuits," talk for the Cornell Electron Devices Society (EDS), Cornell University, Ithaca, Sept. 2014.

7.25 C. Studer, "Analog-to-Information Converters: From Applications to Circuits," plenary talk at GdR ISIS and SoC-SiP workshop on "Acquisition/Echantillonnage comprimé: quelled réalitations/applications pratiques?" at the Télécom ParisTech, Paris, France, Sept. 2014.

7.26 C. Studer, "Landing a Faculty Position," talk for the Women Excel network, ECE Department at Rice University, TX, USA, Oct. 2013

7.27 C. Studer, "Sparse Signal and Image Recovery: Theory, Algorithms, and VLSI Circuits," talk at Washington University of St. Louis, MO, USA, Mar. 2013

7.28 C. Studer, "Sparse Signal and Image Recovery: Theory, Algorithms, and VLSI Circuits," talk at University of Pennsylvania, PA, USA, Mar. 2013

7.29 C. Studer, "Sparse Signal and Image Recovery: Theory, Algorithms, and VLSI Circuits," talk at Cornell University, NY, USA, Mar. 2013

7.30 C. Studer, "Sparse Signal and Image Recovery: Theory, Algorithms, and VLSI Circuits," talk at University of Maryland, MD, USA, Mar. 2013

7.31 C. Studer, "Wideband Compressive Sensing: From Theory to VLSI Circuits," talk at University California Los Angeles, CA, USA, Feb. 2013

7.32 C. Studer, "Wideband Analog-to-Information Conversion: From Theory to VLSI Circuits," talk at Johns Hopkins University, MD, USA, Feb. 2013

7.33 C. Studer, "Wideband Analog-to-Information Conversion: From Theory to VLSI Circuits," talk at University of Wisconsin Madison, WI, USA, Feb. 2013

7.34 C. Studer, "Wideband Analog-to-Information Conversion: From Theory to VLSI Circuits," talk at University of California Santa Barbara, CA, USA, Jan. 2013

7.35 C. Studer, "VLSI Circuits and Systems for Signal Recovery and Compressive Sensing," talk at Rheinisch-Westfälische Technische Hochschule Aachen, Germany, Sept. 2012

7.36 C. Studer, "Algorithms and VLSI Circuits for Wireless Communication and Signal Processing," talk at Télécom Bretagne, Brest, France, June 2012

7.37 C. Studer, "Sparse Signal Recovery: From Theory to VLSI Circuits," talk at the Department of Information Technology and Electrical Engineering (D-ITET), ETH Zürich, Zürich, Switzerland, Apr. 2012

7.38 C. Studer, "Iterative MIMO Decoding: From Theory to VLSI Circuits," talk at the Department of Electrical Engineering (ISY), Linköping University, Linköping, Sweden, Nov. 2011

7.39 C. Studer, "ASIC Implementation of Soft-Input Soft-Output MIMO Detection Using MMSE Parallel Interference Cancellation," talk at Department of Electrical and Computer Engineering, Rice University, TX, USA, May 2011

7.40 C. Studer,"MIMO Communication and the Intricacies of RF Impairments," talk at the Electronics and Computing Department, University of Mondragon, Mondragon, Spain, Jan. 2011

7.41 S. Fateh, C. Studer, and D. Seethaler, "VLSI Implementation of Soft-Input Soft-Output MMSE Parallel Interference Cancellation," talk at Swisscom AG, Berne, Switzerland, Dec. 2010 **(Swisscom and ICTnet Innovations Award 2010)**

7.42 A. Burg and C. Studer, "MIMO Detection and the Intricacies of Transmit-RF Impairments," talk at Lucent/Bell-Labs, Stuttgart, Germany, Nov. 2010

7.43 C. Studer, "Iterative Data Recovery for MIMO Communication and Compressed Sensing," talk at the Department of Electrical Engineering (ISY), Linköping University, Linköping, Sweden, Sept. 2010

7.44 C. Studer, M. Wenk, A. Burg, and H. Bölcskei, "Single Tree-Search Sphere Decoding: Algorithm and Implementation," poster presentation at the EU-US Frontiers of Engineering Symposium, Cambridge, UK, Sept. 2010

7.45 C. Studer, "Sphere Decoding with Resource Constraints," talk at Beceem Communications Inc., Santa Clara, CA, USA, June 2005

## 8. Patents

8.1 R. G. Baraniuk, A. S. Lan, and C. Studer, "Time-varying Learning and Content Analytics Via Sparse Factor Analysis," Rice University, TX, US Patent No. 20,150,170,536, June 2015, *pending*

8.2 R. G. Baraniuk, A. Sankaranarayanan, and C. Studer, "System And Method Of Video Compressive Sensing For Spatial-Multiplexing Cameras," Rice University, USA, No. 20,140,063,314, Mar. 2014, *pending*

8.3 R. G. Baraniuk, A. Sankaranarayanan, J. V. Shi, and C. Studer, "Methods and Systems for Video Compressive Sensing for Dynamic Imaging," Rice University, US Patent No. 10,176,571, Jan. 2019, **(licensed by Siemens Healthineers in 2017)**

8.4 M. Pelissier and C. Studer, "Method of Non-Uniform Wavelet Bandpass Sampling," CEA-LETI Minatec, France, and Cornell University, USA, US Patent No. 10,020,930, July 2018

8.5 M. Wu, C. Dick, and C. Studer, "Coordinate Descent Detector and Precoder for Multiple-Input Multiple-Output (MIMO) System," Xilinx Inc., US Patent No. 9,941,943, Apr. 2018

8.6 C. Jeon, M. Wu, C. Dick, and C. Studer, "System and Method for Downlink Processing in Communication Systems ," Xilinx Inc., USA, US Patent No. 9,876,657, Jan. 2018

8.7 R. G. Baraniuk, A. S. Lan, C. Studer, and A. E. Waters, "Sparse Factor Analysis for Analysis of User Content Preferences," Rice University, TX, US Patent No. 9,704,102, July 2017

8.8 M. Wu, C. Dick, and C. Studer, "Adaptive Multiple-Input Multiple-Output (MIMO) Data Detection and Precoding," Xilinx Inc., US Patent No. 9,525,470, Dec. 2016

8.9 J. R. Cavallaro, C. Dick, C. Studer, A. Vosoughi, M. Wu, and B. Yin, "Matrix Inversion," Rice University, USA, and Xilinx, TX, Aug. 2012, US Patent No. 9,001,924, Apr. 2015

8.10 H. Bölcskei, A. Burg, and C. Studer, "Computation of Extrinsic Information in a Branch-and-Bound Detector," ETH Zurich, Switzerland, PCT/CH2008/000298, July 2008

8.11 H. Bölcskei, A. Burg, and C. Studer, "Modified Distance-Increments for Branch-and-Bound Detection," ETH Zurich, Switzerland, PCT/CH2008/000290, July 2008