

Activity Report 2011–2013

Institute of Communications Engineering

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Impressum

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Stand:

Dezember 2013

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Preface

The institute for *Communications Engineering* was founded in October 2011 by the union of the two former institutes *Information Technology* and *Telecommunications and Applied Information Theory* (Siemens donation chair). The new institute provides research and teaching for several courses of study in the area of communications within the faculty of *Electrical Engineering and Computer Science* of the *Ulm University*. Research areas and offered lectures and labs range from physical layer methods over reliable and secure information transmission in time and space up to man machine interfaces.

The present report covers all activities of members of our institute from October 2011 through December 2013.

1 People

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Dr. Roman Sergienko
Dr. Vladimir Sidorenko
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Lecturers

Dr.-Ing. Hans-Joachim Dreßler

Dr.-Ing. Dejan Lazich

Dr.-Ing. Klaus Linhard

(until 07/12)

Prof. Dr. Max Riederle

Prof. Dr.-Ing. Georg Schmidt

2 Visitors and Visits

Visiting Scholars

- **University of Trieste, Italy**
Prof. Francesca Vatta 09/2011
- **Siberian Federal University and Siberian State Aerospace University, Krasnoyarsk, Russia**
Dr. Sergey Sopov 09/2011–06/2012
- **Institute of Mathematical Research / University of Rennes 1, Rennes, France**
Dr. Pierre Loidreau 01/2012
- **University of Granada, Spain**
David Griol Barres 08/2012
Zoraida Callejas Carrión 08/2012
- **Computer Science Laboratory / École Polytechnique, Palaiseau, France**
Prof. Dr. Daniel Augot 09/2012
- **Haifa University, Haifa, Israel**
Prof. Alexander Bolshoy 09/2012
- **Siberian Federal University and Siberian State Aerospace University, Krasnoyarsk, Russia**
Roman Sergienko 10/2012–03/2013
- **Technical University of Denmark, Copenhagen, Denmark**
Johan Nielsen 11/2012
- **Russian Academy of Sciences, Moscow, Russia**
Dr. Alexey Frolov 11/2012
- **University of Texas, Austin, USA**
Dr. Natalia Silberstein 06/2013

Research Stays at other Universities

- **German University Cairo (GUC), Cairo, Egypt**
Wolfgang Minker, Florian Nothdurft, Tobias Heinroth 11/2011

- **University of Erlangen–Nürnberg**
Robert Fischer 02/2012
- **Institute of Mathematical Research / University of Rennes 1, Rennes, France**
Antonia Wachter-Zeh 03/2012, 09/2012, 03/2013
- **Computer Science Laboratory / École Polytechnique, Palaiseau, France**
Alexander Zeh 03/2012, 09/2012, 03/2013
- **University of Granada, Spain**
Wolfgang Minker, Stefan Ultes, Florian Nothdurft, 06/2012
Helmut Lang, Alexander Schmitt
- **University of Granada, Spain**
Wolfgang Minker, Stefan Ultes, Helmut Lang, 11/2012
Alexander Schmitt
- **Institute of Information Transmission Problems, Russian Academy of Sciences, Moscow, Russia**
Antonia Wachter-Zeh, Alexander Zeh 12/2012
- **University of Newcastle, Australia**
Dr. Werner Teich 12/2012
- **Siberian Federal University and Siberian State Aerospace University, Krasnoyarsk, Russia**
Wolfgang Minker, Florian Nothdurft, Roman Sergienko, 01/2013
Maxim Sidorov, Sergey Zablotkiy
- **University of Tartu, Estonia**
Wolfgang Minker, Florian Nothdurft 03/2013
- **University of Granada, Spain**
Wolfgang Minker, Stefan Ultes, Florian Nothdurft 03/2013
- **Shandong University in Jinan, China**
Martin Bossert 09/2013
- **Siberian Federal University and Siberian State Aerospace University, Krasnoyarsk, Russia**
Wolfgang Minker, Stefan Ultes, Roman Sergienko, 09/2013
Tatiana Gasanova, Maxim Sidorov, Dmitry Zaykovskiy
- **University of Granada, Spain**
Wolfgang Minker, Stefan Ultes 11/2013

3 Awards

- **Martin Bossert**
IEEE Fellow, 2012
- **Robert Fischer, Florian Wäckerle**
Best Paper Award im Rahmen des International OFDM Workshop 2012
Peak-to-Average Power Ratio Reduction in OFDM via Sparse Signals: Transmitter-Side Tone Reservation vs. Receiver-Side Compressed
- **Reinhard Heckel, Steffen Schober, Martin Bossert**
Best-Student-Paper WCSB 2012, June 2012
Determinative Power and Tolerance to Perturbations in Boolean Networks
- **Steffen Schober**
Award of the Ulmer Universitätsgesellschaft e.V. for the most Outstanding Dissertation, July 2012
Analysis and Identification of Boolean Networks using Harmonic Analysis
- **Florian Wäckerle**
ARGUS Research Award 2012
Compressed Sensing for Peak-to-Average Power Ratio Reduction in OFDM
- **Robert Fischer**
IEEE Communications Letters Appreciation 2013
- **Christian Senger**
Award of the Ulmer Universitätsgesellschaft e.V. for the most Outstanding Dissertation, July 2013
Generalized Minimum Distance Decoding with Arbitrary Error/Erasure Tradeoff
- **Martin Bossert**
Member of Leopoldina, Deutsche Akademie der Wissenschaften, July 2013
- **Sven Puchinger**
ARGUS Research Award 2013
Improved Decoding of Partial Unit Memory Codes Using List Decoding of Reed-Solomon Codes
- **Sebastian Stern**
VDE Award for Outstanding Master Thesis 2013
Vergleich des Spitzenwertverhaltens von Ein- und Mehrträgerverfahren

4 Lectures

A detailed description of the lectures is available online.

Advanced Channel Coding (English)

Master 2L/1E

Symbol-by-Symbol APP Decoding; Iterative Decoding of Concatenated Codes; LDPC Codes; Algebraic List Decoding

Advanced Topics in Information Theory (English)

Master 2L/1E

Geometry of Signals and Codes; Optimal Error Control Codes; Strong and Weak Simplex Conjecture; The Channel Coding Theorem; Error Exponent and Channel Capacity, Generalized Error Exponent and Channel Capacity

Angewandte Mathematik für Ingenieure (German)

Master 3L/1E

(Applied Mathematics for Engineers)

Stochastic Processes; Normal Forms of Matrices and their Application in System Theory; Special Functions (e.g., Bessel Functions) and their Application; Algebraic Structures (e.g., Finite Fields)

Applied Information Theory (English)

Master 3L/2E/1P

Uncertainty (Entropy); Mutual Information; Source Coding Theorem; Source Coding Schemes (Shannon–Fano, Huffman, Tunstall, Arithmetic Coding); Universal Source Coding (Lempel–Ziv, Elias–Willems); Channel Capacity and Channel Coding Theorem; Gaussian Channel; Random Coding; Multi-User Information Theory; Dirty Paper Coding; Tomlinson–Harashima Precoding; Information Theory and Cryptology

Benutzerschnittstellen (German)

Bachelor/Master 2L/2S

(User Interfaces)

Introduction into the area of human-computer interaction (HCI); Focus: design and development principles of multimodal user interfaces; Usability engineering and evaluation of multimodal user interfaces

Channel Coding (English)

Master 3L/2E/1P

Block Codes (BCH, Reed–Solomon, Reed–Muller, Hamming, Simplex, Golay); Decoding Algorithms (Majority Logic, Algebraic, Soft, Hard, GMD); Convolutional Codes and Decoding (Viterbi, Fano, Zigangirov–Jelinek); Generalized Code Concatenation; Coded Modulation

Communications Engineering (English)

Master 4L/2E/2P

Equivalent Complex Baseband; Pulse-Amplitude Modulation (PAM); Variants of PAM Transmission Schemes; Signal-Space Representation; Digital Frequency and Phase Modulation; Channel Models; Equalization of Dispersive Channels; Orthogonal Frequency-Division Multiplexing (OFDM)

Communication Systems (English)

Master 2L/1E

Mobile Radio Channel; Basics of Mobile Communication Systems; GSM and UMTS

Compressed Sensing (German)

Master 2L/1E

Geometry of N Dimensions; Geometrical Interpretation of Systems of Linear Equations; Convex Polytopes; Arrangements of Hyperplanes; Approximation Theory; Distance Measures in Banach Spaces; Optimization and Linear Programming; Sampling by Compressed Sensing; Data Acquisition by Compressed Sensing

Dialogue Systems (German)

Master 2L/2E

Introduction into the area of multimodal spoken natural language dialogue systems; Focus: Acoustic Processing; Speech Signal Analysis; Speech Recognition; Spoken Natural Language Understanding; Dialogue Processing and Speech Synthesis

Einführung in die Nachrichtentechnik (German)

Bachelor 3L/2E/2P

(Introduction to Communication Engineering)

History and Milestones of Communications; Models in Communications; Shannons Uncertainty and Source Coding; Signals for Transmission of Information Channels; Decision Theory; Error Probability; Channel Coding Theorem; Error Correcting Codes; Reliable Data Transmission; Multiple Access; Routing; Security

Embedded Security (English)

Master 3L/1E

Implementation and Side-Channel Attacks in Cryptology; Countermeasures to Implementation Attacks; Arithmetic for Cryptographic Hardware; Random Number Generators; Physical Unclonable Functions; Digital Tachograph System; Secure Software Download for Electronic Control Units in Cars

Grenzen der Informationsverarbeitung (German)

Master 2L/1E

(Performance Limits of Computation)

Moore's Law: Past, Present, and Future; Information and Complexity Theory; Thermodynamical Aspects to Limits of Computation; Computation as a Communication Problem; Interpretation of the Channel Coding Theorem; Genetic Code and Molecular Computing; Basics of Quantum Computing; Kolmogorov's Superposition Theorem and Neural Computing

Information Theory and Biology (English)

Master 2L/1E/1P

(Information and System Theory in Life Sciences)

Analysis of Biological Systems using Concepts, Models, and Methods of Information and Systems Theory; Information Transmission in Cells; Information Content of Binding Sites; ORF Length Distributions; Phylogenetic Trees and Compression Distance; Elementary Circuits of Transcription Networks; Boolean Networks; Reconstruction Problems of Boolean Networks

Iterative Methods for Wireless Communications (English)

Master 2L/1E

Fix-Point Iteration; Convergence and Convergence Rate of Iterative Methods; Vector-Valued Transmission; (Iterative) Vector Equalization; Probability Theory for Iterative Decoding; Tanner Graph; Low-Density Parity Check Codes; BCJR Algorithm; Turbo Codes; Iterative Joint Demapping, Equalization, and Decoding (Turbo Equalization)

Multiuser Communications and MIMO Systems (English)

Master 3L/1E

MIMO Communications; Performance Criteria; Introduction to Lattices; Lattice Decoding and the "Sphere Decoder"; Equalization via Lattice Reduction; "Writing on Dirty Paper"; Multiuser Communications; Advanced Transmitter-Side Techniques; Interference Channel

Satellite Communications and Navigation (English) Master 2L/1E

History, Development, and Potential of Satellite Communications; Satellite Orbits; Launch and Installation in Orbit; Modulation and Multiple Access; Satellite Channel; Link Budget Calculations; Mobile Satellite Communication Systems; Satellite Navigation

Signal Processing Algorithms (English) Master 2L/1E

Random Numbers; Spectral Analysis; Coherence Estimation; Digital Filter and Filter Design; Adaptive Filter; Sampling Rate Conversion, Wiener Filter

Signale und Systeme (German) Bachelor 3L/2E/2T/1P
(Signals and Systems)

Discrete Signals and Systems; z-Transformation; Generalized Functions and Distributions; Continuous Signals and Systems; Fourier-Transformation; Sampling Theorem; Fast Fourier Transform; Laplace-Transformation its Application to Continuous LTI Systems; Stochastic Processes

Statistical Signal Processing (English) Master 3L/1E

Concept of Random Variables; Functions of Random Variables; Stochastic Processes; Spectral Representation and Spectrum Estimation; Mean Square Estimation

Theory of Digital Networks (English) Master 3L/2E/1P

Hierarchical Structure of Networks; OSI Model; Physical Layer; Framing; ARQ; Multiple Access (Aloha, CSMA, Token, ...); Queuing Theory; Routing (Bellman–Ford, Dijkstra)

5 Research

5.1 Research Topics

The research carried out at the institute is divided into the subsequent four groups.

Algebraic Coding Theory

Block and convolutional codes for error correction and detection over Hamming, rank, and combinatorial metrics are constructed and analyzed. The main focus is also on the soft- and hard-decision and list decoding of these code classes. Especially soft-decision decoding of Reed-Solomon codes is an important research area. The applications are random linear network coding, storage coding, compressed sensing, interleaved codes, concatenated codes, and hybrid ARQ protocols. Recently, the application of algebraic coding for cryptology was started.

Bio Information Theory

Information and communication theory is also applicable for living species, namely the DNA in cells is a storage which is read and transmitted. The particular projects are discrete models of genetic regulatory networks (random Boolean networks), overlapping genes, and next generation sequencing. In particular the erroneous measurements can be treated with methods from reliable data transmission and coding theory improves the labeling of the DNA fragments.

Communication Theory

The members of the Communication Theory group address the challenges of next-generation communications systems. The main focus is on the mathematical and theoretical foundations of communication and signal processing schemes. This includes equalization schemes and the utilization of interference in multiantenna and multiuser systems, in particular, in form of precoding. The problems caused by nonlinearities in the transmission channel, both, the peak-power problem (e.g., in OFDM transmission), as well as nonlinear transmission media (e.g., fiber optics) are addressed. Moreover, the structure of signal is exploited, e.g., via compressed sensing methods, and transmission schemes without any channel knowledge are designed.

Dialogue Systems

The Dialogue Systems Group has placed its general research focus on the development and evaluation of user-friendly Spoken Language Dialogue Systems (SLDS). This objective is based on the following major aspects: adaptive dialogue management, assistiveness as well as evaluation and usability issues.

The Dialogue Systems Group is joint founder of the interdisciplinary Competence Center Perception and Interactive Technologies. Research groups from Ulm University aim at developing innovative technologies in different application domains and settings for the human-computer interaction. Major research areas include sensor-based models for perception, learning mechanisms and adaptivity, interactive systems in networked applications, ubiquitous computing, multimedia and visualization as well as spoken language dialogue systems interaction and multimodality. The center proposes a framework for fundamental and applied research and combines different interdisciplinary issues.

5.2 Research Projects

DFG Projects (German Research Council)

During 2011–2013 the following projects were supported by the German Research Council “Deutsche Forschungsgemeinschaft” (DFG).¹

- ***Coding Techniques for Transmitting Packets Through Complex Communication Networks***
Grant: Bo 867/21-1/2 (SPP COIN)
Duration: 48 months, Begin: November 2009, End: November 2013.
- ***Assistives und adaptives Dialogmanagement***
Grant: Minker (SFB Transregio 62 TP B01)
Duration: 72 months, Begin: 2009
- ***Finding New Overlapping Genes and their Theory (FOG-Theory)***
Grant: Bo 867/23-1/2 (SPP InKoMBio)
Duration: 60 months, Begin: January 2010
- ***The Evolutive Adaptation of the Transriptional Information Transmission in E.Coli***
Grant: Bo 867/25-1/2 (SPP InKomBio)
Duration: 48 months, Begin: January 2010
- ***Coordination Project InKoMBio***
Grant: Bo 867/31-1
Duration: 60 months, Begin: January 2010
- ***Codierung, Modulation und Detektion für leistungseffiziente aufwandsgünstige Impulse-Radio Ultra-Wideband Übertragungssysteme***
Grant: Fi 982/3-2 (SPP UKoLoS, cooperation with Prof. Huber)
Duration: 24 months, Begin: July 2010, End: July 2012
- ***Intra-Corporal Localization and Communications using UWB***
Grant: Li 659/11-1 (SPP UKoLoS, cooperation with Prof. Schumacher)
Duration: 24 months Begin: June 2011, End: May 2013
- ***Effiziente Ausnutzung des Spektrums durch Einsatz kognitiver Overlay-Techniken in Mehrantennenkommunikationssystemen***
Grant: HU 1835/3-1
Duration: 24 months, Begin: April 2011, End: April 2013
- ***Methoden der Kanalcodierung für Compressed Sensing***
Grant: Bo 867/27-1
Duration: 36 months, Begin: May 2011
- ***Nichtkohärente Übertragungsverfahren für MIMO-Kanäle und deren Erweiterung auf drahtlose Netze mit Relaisstationen***

¹SPP: “Schwerpunktprogramm” (priority project); SFB: “Sonderforschungsbereich” (SFB).

Grant: Li 658/13-1 (cooperation with Profs. Sezgin and Utkovski)

Duration: 24 months, Begin: October 2011, End: October 2013

■ ***Variants of Modulo-Precoding for Cooperative Transmission Strategies and Interference Utilization in Broadcast Channels and Network Coding***

Grant: Fi 982/4-2 (SPP COIN, cooperation with Prof. Huber)

Duration: 24 months, Begin: October 2011, End: October 2013

■ ***Decoding in Weighted Combinatorial and Other Metrics***

Grant: Bo 867/28-1

Duration: 24 months, Begin: June 2012

■ ***Analoge Signalverarbeitung: Algorithmen — Strukturen — elektronische Schaltungen*** (cooperation with Prof. Schumacher)

Grant: Li 659/12-1

Duration: 24 months, Begin: January 2011

■ ***Interrelations between Channel Coding and Precoding in Transmission Strategies for Broadcast Channels and in Network Coding*** (cooperation with Profs. Fischer and Huber)

Grant: Bo 867/29-3 (SPP COIN)

Duration: 24 months, Begin: November 2013

■ ***Interrelations between Channel Coding and Precoding in Transmission Strategies for Broadcast Channels and in Network Coding*** (cooperation with Profs. Bossert and Huber)

Grant: Fi 982/4-3 (SPP COIN)

Duration: 24 months, Begin: November 2013

■ ***Analyse der Informationsverarbeitung in molekularen Netzwerken mithilfe der Kommunikationstheorie diskreter Prozesse***

Grant: SCHO 1576/1-1 (SPP InKoMBio)

Duration: 18 months, Begin: January 2014

■ ***DFG Priority Program (SPP) InKoMBio*** (Homepage: www.inkombio.de)

Prof. Martin Bossert is the coordinator of the DFG priority program DFG SPP 1395 “Informations- und Kommunikationstheorie in der Molekularbiologie (InKomBio)”

The program committee consists of Prof. Dr.-Ing. M. Bossert, Prof. Dr.-Ing. J. Hagenauer (Technische Universität München), Prof. Dr. H. P. Herzel (Humboldt-Universität Berlin), and Prof. Dr. M. Kühl (Universität Ulm).

Description: In the middle of the 20th century, information theory and molecular genetics have gone through a great history of success: namely the fundamental work of Shannon in 1948, which was giving rise to the modern information- and communication society we are living in, and also the discovery of the double he-

lix structure of DNA by Watson and Crick in 1953, which was the beginning of contemporary genetics and its use in medicine. The information read from the DNA, is transmitted, duplicated, changed (mutated) and is used for controlling many processes in and in between cells. All these procedures can be described and analyzed with models and methods of information theory. We are convinced that information- and communication theorists, together with biologists and medical scientists can contribute to a better understanding of processes in the cell concerning communication, even though there have been significant results in research over the last years. In information theory, transmission of information is viewed in an abstract way, so it is expected that independently of concrete realizations, concepts, modules and results can be applied on molecular communication processes. Therefore the program focuses exclusively on assisting interdisciplinary projects in between information- and communication scientists on one side, and biologists and medical scientists on the other side. Modern Biology, often referred to as the key science of the 21th century, is currently undergoing a change. New theoretical concepts, modern methods of data analysis and mathematical models will play a strategical role in molecular biology and this can only be accomplished by intensive interdisciplinary collaboration. This program intends to encourage and assist this collaboration.

■ **Reinhart Koselleck Project**

The purpose of Reinhart Koselleck projects is to enable outstanding researchers with a proven scientific track record to pursue exceptionally innovative or higher-risk projects.

It is founded for researchers who hold or are eligible to hold professorships, especially at universities, and who have an outstanding curriculum vitae and great scientific potential. The project requirements are exceptionally innovative or higher-risk projects that cannot be funded within the scope of other DFG programmes or within the framework of the applicant's own institution.

Prof. M. Bossert applied for a project in the Reinhart Koselleck program with the title "Decoding of algebraic codes beyond half the minimum distance and list-decoding". The application was approved in 08/2009.

BMBF Projects (Federal Ministry of Education and Research)

■ ***EUREKA-Projekt SASER (Safe and Secure European Routing): Adaptive Modulations- und Codierungsverfahren für flexible und sichere optische Metro- und Firmennetze***

Grant: 16BP12406 (R. Fischer)

Duration: 54 man-months, Begin: August 2012

6 Publications

The publications are sorted according to the respective professor, which coincides with the research topics (Bossert: Groups A and B; Fischer and Lindner: Group C; Minker: Group D).

Publications by Prof. Bossert's Group

Books and Book Chapters

- [1] Martin Bossert. *Einführung in die Nachrichtentechnik*. Oldenbourg Wissenschaftsverlag, 2012. ISBN 978-3-486-70880-6.
- [2] Martin Bossert. *Kanalcodierung*. Oldenbourg, München, 3. überarb. Auflage 2013.
- [3] Martin Bossert, Carolin Huppert, Johannes G. Klotz. Resource Allocation Using Broadcast Techniques. In Hermann Rohling, editor, *OFDM Concepts for Future Communication Systems*, pp. 122–127. Springer-Verlag, 2011.

Journal and Conference Papers

- [1] Anas Chaaban, Aydin Sezgin. Capacity Results for a Primary MAC in the Presence of a Cognitive Radio. In *Proceedings of 54th Annual Global Communications Conference GLOBECOM*, Houston, USA, December 2011.
- [2] Anas Chaaban, Aydin Sezgin. An Extended Etkin-Type Outer Bound on the Capacity of the Gaussian Interference Channel. In *Proceedings of 2011 Asilomar Conference on Signals, Systems, and Computers*, St. Pacific Grove, USA, November 2011.
- [3] Anas Chaaban, Aydin Sezgin, Amir Salman Avestimehr. On the Sum Capacity of the Y-Channel. In *Proceedings of 2011 Asilomar Conference on Signals, Systems, and Computers*, St. Pacific Grove, USA, November 2011.
- [4] Ronny Feuer, Katrin Gottlieb, Gero Viertel, Johannes G. Klotz, Steffen Schober, Martin Bossert, Oliver Sawodny, Georg A. Sprenger, Michael Ederer. Model-based analysis of an adaptive evolution experiment with *Escherichia coli* in a pyruvate limited continuous culture with glycerol. *EURASIP Journal on Bioinformatics and Systems Biology*, Vol. 2012, No. 1, pp. 14, 2012.

- [5] Alexey Frolov, Victor V. Zyablov, Vladimir R. Sidorenko, Robert F. H. Fischer. On a Multiple-Access in a Vector Disjunctive Channel. In *Information Theory Proceedings (ISIT), 2013 IEEE International Symposium on*. IEEE, 2013.
- [6] Reinhard Heckel, Steffen Schober, Martin Bossert. Determinative Power and Tolerance to Perturbations in Boolean Networks. In *Proc. 9th International Workshop on Computational Systems Biology (WCSB 2012)*, Ulm, Germany, June 2012.
- [7] Reinhard Heckel, Steffen Schober, Martin Bossert. Harmonic analysis of Boolean networks: determinative power and perturbations. *EURASIP Journal on Bioinformatics and Systems Biology*, Vol. 2013, No. 1, pp. 6, 2013. PMID: 23642003.
- [8] Carolin Huppert, Johannes G. Klotz. On the Performance of Tomlinson-Harashima-Precoding with Tilted Constellation in Two User Gaussian Broadcast Channels. In *9th International ITG Conference on Systems, Communications and Coding (SCC)*, Munich, Germany, Jan. 2013.
- [9] Carolin Huppert, Vinay Majjigi, John M. Cioffi. Buffer Stability in Multi-User Streaming Systems Applying Water-Filling with Adaptive Levels. *IEEE Communications Letters*, Vol. 16, No. 3, pp. 284–287, 2012.
- [10] Carolin Huppert, Aydin Sezgin. On Beamforming for Overlay Cognitive Multiple Antenna Systems. In *Proc. 8th International Symposium on Wireless Communication Systems*, Aachen, Germany, Nov. 2011.
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- [12] Sabine Kampf, Wenhui Li. Decoding Interleaved Reed-Solomon and Hermitian Codes with Generalized Divisions. In *Systems, Communication and Coding (SCC), Proceedings of 2013 9th International ITG Conference on*, pp. 1–6. VDE, Jan. 2013.
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- [53] Sergey Zablotskiy, Teerat Pitakrat, Kseniya Zablotskaya, Wolfgang Minker. GMM Parameters Estimation by Means of EM and Genetic Algorithm. In *14th International Conference on Human-Computer Interaction*, 2011.
- [54] Sergey Zablotskiy, Eugene Semenko, Alexander Shvets. Coevolutionary asymptotic genetic algorithm for syllable model based identification of sentences in automatic recognition of continuous speech (in Russian, abstract in English). *Bulletin of Siberian State Aerospace University named after academician M.F. Reshetnev*, Vol. 3(36), pp. 20–25, 2011.
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7 Seminars

- Prof. Dr. Sergei Fedorenko. *The DFT with reduced multiplicative complexity*, October 27, 2011
- Qian Jiang. *A Simulative Study of Modern Error/Erasure Decoding Schemes*, October 31, 2011
- Matthias Hiller. *Optimized Fuzzy Extractor for PUFs on FPGAs*. November 21, 2011
- Prof. Dr.-Ing. Robert Fischer. *Der Goldene Schnitt (in) der Nachrichtentechnik*, November 28, 2011
- Johana Cardenas. *Investigation of continuous-time recurrent neural networks as vector equalizer*, December 5, 2011
- Harris Hafeez. *On Algorithms Decoding Reed-Solomon Codes Beyond Half the Minimum Distance*, December 19, 2011
- Muhammad Tariq Afridi. *Rejection of Intentionally Invalidated Speed Limit Signs*, January 9, 2012
- Florian Hock. *Comparison of some Algorithms for GMD Decoding of Reed-Solomon Codes*, January 16, 2012
- Prof. Pierre Loidreau. *A public-key cryptosystem based on the problem of reconstructing q -polynomials*, January 23, 2012
- Rupesh Agarwal. *Design, Implementation and Verification of Positioning Algorithms with Good Performance/Complexity Trade-off*, January 30, 2012
- Prof. Dr.-Ing. Robert Fischer. *Trellise, Systemtheorie und ...*, February 13, 2012
- Marcus Grossmann (TU Ilmenau). *Transmission Strategies for Broadband Wireless Systems with MMSE Turbo, Equalization*, February 27, 2012
- Prof. Dr. ir. Jos H. Weber (Delft University of Technology, The Netherlands). *Extensions of Knuth's Balanced Coding Scheme*, March 5, 2012
- Gero Viertel. *Validierung eines Verbundmodells von Transkriptions- und metabolischem Netzwerk von Escherichia Coli*, March 9, 2012
- Tianyi Wang. *Submanifold Learning for Head Pose Estimation*, March 19, 2012
- Salma Hesham Badreldin. *Syndrome based interpolation for Reed-Solomon list*

decoders: *Algorithmic level and hardware (or VHDL) implementation*, March 20, 2012

- Mostafa Hosni Mohamed. *Construction and Decoding of Rank-Metric Based Multi-Memory Codes*, April 2, 2012
- Jing Zhang. *A user-adaptive nature language generation system*, April 2, 2012
- Omar Mohamed. *Transmit Strategies for MIMO Multi-User Systems with Multi-Antenna Amplify-and-Forward Relays*, April 23, 2012
- Paul Wallner. *Untersuchung der Leistungsfähigkeit iterativer Empfangsverfahren mit „Relaxationsparameter für ein auf Gruppen orthogonaler Spreizcodes bestehendes Übertragungsverfahren“*, April 23, 2012
- Lianghai Ji. *Implementation and Analysis of the Wireless Communication System OFDM-IDMA*, May 7, 2012
- Robert ElChab. *Evaluation of Statistical Models for User Satisfaction and Interaction Quality Classification*, May 21, 2012
- Mohamed Ibrahim. *Compressive Sensing for Ultra Wideband Channel Estimation*, June 18, 2012
- Ana Cantarero. *Enhanced Virtual Antenna Mapping*, June 25, 2012
- Georg Fischer. *Decoding Techniques for interleaved generalized Reed-Solomon Codes*, June 29, 2012
- Savina Koleva. *Statistical Approaches for Adaptive Spoken Dialogue Management*, July 2, 2012
- Mina Shehata. *Concatenated Compressed Sensing based Error Correcting Codes*, July 9, 2012
- Florian Wäckerle. *Verwendung von Compressed Sensing zur Spitzenwertreduktion und zur Behandlung von Clipping-Effekten in OFDM*, July 9, 2012
- Frank Dangel. *Zweikanalige Verfahren zur Sprachsignalverbesserung für Mobilgeräte*, July 16, 2012
- Sven Puchinger. *Improved Decoding of Partial Unit Memory Codes Using List Decoding of Reed-Solomon Codes*, July 20, 2012
- Sherif Mohamed. *Investigation of high-order recurrent neural networks as continuous decoder*, July 24, 2012
- Matthias Düll. *EMV-toleranter Empfang von OFDM-basierten Rundfunksignal*, August 6, 2012
- Ahmed Lotfy Yonis Radwan. *Measurement Matrices Based on Spherical Codes for Compressed Sensing*, August 15, 2012

- Ahmed Mansour. *Evaluation of Entropy Estimators, Improvements and Comparison*, August 15, 2012
- Thomas Jerkovits. *Comparison of Bounds on the Minimum Distance of Cyclic Codes*, September 10, 2012
- Di Chen. *On fast software decoding of interleaved Gabidulin codes*, September 17, 2012
- Prof. Alexander Bolshoy (University of Haifa, Israel), Tatiana Tatarinova (University of Glamorgan, Wales, UK). *Revealing Factors Affecting Gene Length-Review of applicable methods of combinatorial optimization*, September 24, 2012
- Stefano Rini (TU Munich). *A Reference Based Genomic Compression Algorithm*, October 9, 2012
- Alexander Schneider. *Sendestrategien im kognitiven MIMO-Funkkanal mit einem nicht adaptiven Primärsystem* October 22, 2012
- Johan Nielsen (Danmarks Tekniske Universitet). *The Wu list-decoder for Generalized Reed-Solomon codes using the Euclidean Algorithm*, November 12, 2012
- Alexey Frolov (Institute for Information Transmission Problems (IITP), Moscow). *Multiple Access System for a Vector Disjunctive Channel*, November 14, 2012
- Prof. Frank Kschischang (University of Toronto). *Staircase Codes*, November 29, 2012
- Sebastian Stern. *Vergleich des Spitzenwertverhaltens von Ein- und Mehrträgerverfahren*, December 10, 2012
- Gero Viertel. *Reed Muller Codes for Compressed Sensing*, December 17, 2012
- Dr.-Ing. Helmut Griebner (ADVA Optical Networking Martinsried, Munich). *Maintaining the bandwidth abundance: How fiber keeps pace with ever increasing data rates*, February 4, 2013
- Martin Schießl. *MEMS Mikrofon Arrays für Freisprechen*, February 18, 2013
- Dr. Alex Alvarado (Marie Curie Fellow, University of Cambridge). *High-SNR Asymptotics of Mutual Information for Discrete Constellations with Applications to BICM*, May 6, 2013
- Jinchun Sun. *Assessment of Peak-to-Avg. Power Ratio Reduction Schemes Utilizing Receiver-Side Reconstruction via Compressed Sensing*, May 27, 2013
- Johannes Klotz. *Computing Preimages of Boolean Networks using the well known Sum-Product Algorithm*, June 3, 2013
- Dr. Vahid Forutan. *Cooperative Relaying Techniques For Traffic Transfer In Wireless Sensor Networks*, June 12, 2013

- Faisal Akram. *Coherence Optimization Used in Sparse Recovery*, June 17, 2013
- Dung Pham. *Deterministic Sensing Matrices Based on Algebraic Curves*, June 17, 2013
- Kotchapol Yoosooksawat. *Reconstruction Algorithms for Sensing Matrices Based on Cyclic Codes*, June 24, 2013
- Matthias Gay (Hochschule Mittweida). *Sparse Reconstruction Properties of Classes of Fourier Sub-matrices*, June 26, 2013
- Natalia Silberstein, Ph.D. (University of Texas, Austin, USA). *Codes for distributed storage systems via rank-metric codes*, June 26, 2013
- Hüseyin Dikme. *Rule-Based Adaptation of the Dialogue Strategy to Interaction Quality*, July 01, 2013
- Mario Hermanutz. *Entwicklung von Sprachdialogkonzepten für den Einsatz bei proaktivem Systemverhalten im Fahrzeug*, August 5, 2013
- Ahmed Abdelazim. *Design of an LDACS1-based Navigation Receiver*, October 7, 2013
- Michael Walter (DLR, Oberpfaffenhofen). *Scattering in time-variant mobile-to-mobile communication channels*, October 7, 2013
- Matthias Führle. *Error-Erasure Decoding of Gabidulin Codes for Network Coding*, October 11, 2013
- Markus Ulmschneider. *Nonbinary Small-Minimum-Distance Cyclic Codes for Bounding the Minimum Distance of Cyclic Codes*, October 11, 2013
- Mahmoud Almarashli. *Barcodes Based on Watermarks for Indel Correction*, October 17, 2013
- David Röder. *Untersuchung des Einflusses des Guard-Intervalls auf das Spitzenwertverhalten von OFDM*, October 28, 2013
- Xiaozhou Wang. *On efficient decoding algorithms for folded Hermitian codes*, October 28, 2013
- Andreas Braun. *Vergleich von diskreten Rekonstruktionsalgorithmen für Compressed Sensing*, November 11, 2013
- Benedikt Leible. *Effiziente Implementierung der Split-Step-Fourier-Methode mittels Grafikprozessoren*, November 11, 2013
- Juliana Miehle. *Untersuchung von überlappenden Genen mit Hilfe interpolierter Markov Modelle*, November 25, 2013
- Thomas Morawetz. *Niedrigenergie-Datenübertragung am Beispiel einer Temperaturerfassung*, December 06, 2013

- Prof. Elena Fimmel, Prof. Markus Gumbel and Prof. Lutz Strümgmann (Faculty of Computer Science, Mannheim University of Applied Sciences). *The Binary Dichotomic Algorithm (BDA) and BDA-generated Models of the Genetic Code*, December 09, 2013
- Simon Lüke. *Investigation of the Error Propagation in Regulatory Boolean Networks*, December 16, 2013
- Peter Kabiri. *Fast Euclidean Algorithm for Multi-Sequence Shift Register Synthesis*, December 16, 2013

8 Ph.D. Theses

8.1 Supervised Ph.D. Theses

- Sabine Kampf. *Decoding Hermitian Codes — An Engineering Approach*, Institute of Communications Engineering, Ulm University, 2011.
Reviewers: Prof. M. Bossert, Prof. K. Dietmayer, Ulm University.
- Christian Senger. *Generalized Minimum Distance Decoding with Arbitrary Error/Erasure Tradeoff*, Institute of Communications Engineering, Ulm University, 2011.
Reviewers: Prof. M. Bossert, Prof. F.R. Kschischang, PhD, University of Toronto.
- Tobias Herbig. *Self-Learning Speaker Identification for Enhanced Speech Recognition*, Institute of Communications Engineering, Ulm University, 2011.
Reviewers: Prof. W. Minker, Prof. R. Häb-Umbach, University of Paderborn.
- Daniel Vasquez. *Hierarchical Neural Network Structures for Modeling Inter and Intra Phonetic Information for Phoneme Recognition*, Institute of Communications Engineering, Ulm University, 2011.
Reviewers: Prof. W. Minker, Prof. G. Palm, Ulm University.
- Matthias Bezold. *Adapting Multimodal Interactive Systems to User Behavior*, Institute of Communications Engineering, Ulm University, 2011.
Reviewers: Prof. W. Minker, Prof. M. Weber, Ulm University.
- Olaf Schreiner. *Automatic Speech Recognition Using Large Word Lists For Voice User Interfaces*, Institute of Communications Engineering, Ulm University, 2011.
Reviewers: Prof. W. Minker, Prof. G. Palm, Ulm University.
- Andreas Schenk. *Coding, Modulation, and Detection for Impulse-Radio Ultra-Wideband Communications*, University of Erlangen-Nürnberg, 2012.
Reviewers: Prof. R. Fischer, Prof. L. Lampe, University of British Columbia, Vancouver, Canada and Prof. J. Huber, University of Erlangen-Nürnberg.
- Tobias Heinroth. *Model-Driven Adaptation for Spoken Dialogues in Intelligent Environments*, Institute of Communications Engineering, Ulm University, 2012.
Reviewers: Prof. W. Minker, Prof. R. López-Cózar Delgado, University of Granada.
- Alexander Schmitt. *Statistical Modeling for Online Monitoring of Adaptive Spoken Dialog Systems*, Institute of Communications Engineering, Ulm University, 2012.

Reviewers: Prof. W. Minker, Prof. R. López-Cózar Delgado, University of Granada.

- Cristina Rico. *Medium Access Control Protocols in Mobile Ad-hoc Networks Using Beaconing*, Institute of Communications Engineering, Ulm University, 2012.

Reviewers: Prof. W. Minker, Prof. T. Strang, DLR Oberpfaffenhofen and TU Munich.

- Alexander Zeh. *Algebraic Soft- and Hard-Decision Decoding of Generalized Reed-Solomon and Cyclic Codes*, Institute of Communications Engineering, Ulm University, 2013.

Reviewers: Prof. M. Bossert, Prof. M. Kuijper, University of Melbourne.

- Antonia Wachter-Zeh. *Decoding of Block and Convolutional Codes in Rank Metric*, Institute of Communications Engineering, Ulm University, 2013.

Reviewers: Prof. M. Bossert, Prof. T. Høholdt, Technical University of Denmark.

- Frederic Knabe. *Transmit Strategies for MIMO Multi-User Channels with AF-Relay*, Institute of Communications Engineering, Ulm University, 2013.

Reviewers: Prof. M. Bossert, Dr. D. Gündüz, Imperial College London.

- Dmitry Zaykovskiy. *Optimizing Client-Server Architectures for Spoken Language Dialogue Systems*, Inst. of Communications Engineering, Ulm University, 2013.

Reviewers: Prof. W. Minker, Prof. A. Wendemuth, University of Magdeburg and Prof. H.-P. Grossmann, Ulm University.

- Mohammed Khider. *Multisensor-Based Positioning for Pedestrian Navigation*, Institute of Communications Engineering, Ulm University, 2013.

Reviewers: Prof. J. Lindner, Prof. U.-C. Fiebig, DLR Oberpfaffenhofen, and Prof. R. Schober, University of Erlangen-Nürnberg.

8.2 Co-Supervised Ph.D. Theses

- Bodgan Vlasenko. *Emotion Recognition within Spoken Dialogue Systems*, University of Magdeburg, 2011.
Reviewers: Prof. A. Wendemuth, Prof. W. Minker.
- Bernhard Wiegel. *Quality of Service in Fahrzeug-Fahrzeug-Netzen — dezentrale und schlichtübergreifende Steuerung des Nachrichtenaufkommens*, Ulm University, 2012.
Reviewers: Prof. H.P. Großmann, Prof. M. Bossert.
- Marcus Großmann. *Transmission Strategies for Broadband Wireless Systems with MMSE Turbo Equalization*, TU Ilmenau, 2012.
Reviewers: Prof. R. Thomä, Dr. rer. nat. W. Teich, Prof. V. Kühn.
- Nikolai Sergeev. *A new Approach to Object Recognition*, Ulm University, 2012.
Reviewers: Prof. G. Palm, Prof. W. Minker.
- Bassam Jabaian. *Systèmes de compréhension et de traduction de la parole: vers une approche unifiée dans le cadre de la portabilité multilingue des systèmes de dialogue*, University of Avignon, 2012.
Reviewers: Prof. F. Yvon, Prof. W. Minker.
- Joachim Boerger. *Fahrerintentionserkennung und Kursprädiktion mit erweiterten maschinellen Lernverfahren*, Ulm University, 2012.
Reviewers: Prof. G. Palm, Prof. W. Minker.
- Yun Chen. *Automatic Modulation Classification in Mobile OFDM Systems*, University of Duisburg-Essen, 2013.
Reviewers: Prof. A. Czylik, Prof. R. Fischer
- Christian Franck. *On Intersection Codes and Iterative Decoding*, University of Luxembourg, 2013.
Reviewers: Prof. U. Sorger, Prof. M. Bossert.
- Jingying Bi. *Mismatched Filter Design for Radar Systems*, TU Hamburg-Harburg, 2013.
Reviewers: Prof. H. Rohling, Prof. J. Lindner.
- Hung Tran. *Performance Analysis of Cognitive Radio Networks with Interference Constraints*, School of Computing, Blekinge Institute of Technology (BTH), Karlskrona, Sweden, 2013.
Chairperson: Prof. H.-J. Zepernick, Opponent: Prof. T. Wysocki, Member of the grading committee: Prof. Z. Hadzi-Velkov, Dr. rer. nat. W. Teich, Dr. Magnus Nilsson

- Johan S.R. Nielsen. *List Decoding of Algebraic Codes*, Technical University of Denmark, 2013.
Reviewers: Prof. P. Beelen, Prof. T. Høholdt, Prof. M. Bossert.
- Michael Richter. *Zentrales Verkehrsmanagementsmanagement zur energie- und zeit-optimalen Verkehrsflusslenkung stochastischer Fahrzeugpopulationen*, Ulm University, 2013.
Reviewers: Prof. H. Kabza, Prof. W. Minker.
- Sandro Rodriguez Garzon. *Kontextsensitive Personalisierung automotiver Benutzerschnittstellen*, TU Berlin, 2013.
Reviewers: Prof. P. Pepper, Prof. W. Minker.
- David Hrabal. *Emotion Classification in Human-Computer Interaction on the Basis of Physiological Data*, Ulm University, 2013.
Reviewers: Prof. H. Traue, Prof. W. Minker.

8.3 Co-Supervised Habilitations

- Dr.-Ing. Nataša Živić. *Coding and Cryptography Synergy for a Robust Communication*, University of Siegen, 2012.
Reviewers: Prof. C. Ruland, Prof. M. Bossert

9 Theses

9.1 Diploma Theses

- [1] Maximilian Grieser. *Adaptive graphenbasierte Routenoptimierung unter Berücksichtigung geometrischer Höhendaten*. Diploma thesis, Ulm University, Sep. 2012.
- [2] Matthias Hiller. *Optimized Fuzzy Extractor for PUFs on FPGAs*. Diploma thesis, Ulm University, Oct. 2011.
- [3] Florian Hock. *Comparison of Some Algorithms for GMD Decoding of Reed-Solomon Codes*. Diploma thesis, Ulm University, Jan. 2012.
- [4] Savina Koleva. *Statistical Approaches for Adaptive Spoken Dialogue Management*. Diploma thesis, Ulm University, May 2012.
- [5] Gero Viertel. *Reed Muller Codes for Compressed Sensing*. Diploma thesis, Ulm University, Dec. 2012.

9.2 Master Theses

- [1] Ahmed Abdelazim. *Design of an LDACS1-based Navigation Receiver*. Master's thesis, Ulm University, Sep. 2013.
- [2] Muhammad Tariq Afridi. *Rejection of Intentionally Invalidated Speed Limit Signs*. Master's thesis, Ulm University, Nov. 2011.
- [3] Rupesh Agarwal. *Design, Implementation and Verification of Positioning Algorithms with Good Performance/Complexity Trade-off*. Master's thesis, Ulm University, Jan. 2012.
- [4] Faisal Akram. *Coherence Optimization Used in Sparse Recovery*. Master's thesis, Ulm University, June 2013.
- [5] Mahmoud Almarashli. *Barcodes Based on Watermarks for Indel Correction*. Master's thesis, Ulm University, Oct. 2013.
- [6] Salma Hesham Badreldin. *Syndrome based interpolation for Reed-Solomon list decoders: Algorithmic level and hardware (or VHDL) implementation*. Master's thesis, Ulm University, Mar. 2012.
- [7] Ana Cantarero. *Enhanced Virtual Antenna Mapping*. Master's thesis, Ulm University, June 2012.

- [8] Johana Cardenas. *Investigation of continuous-time recurrent neural networks as vector equalizer*. Master's thesis, Ulm University, Dec. 2011.
- [9] Di Chen. *On fast software decoding of interleaved Gabidulin codes*. Master's thesis, Ulm University, Sep. 2012.
- [10] Frank Dangel. *Zweikanalige Verfahren zur Sprachsignalverbesserung für Mobilgeräte*. Master's thesis, Ulm University, June 2012.
- [11] Hüseyin Dikme. *Rule-Based Adaptation of the Dialogue Strategy to Interaction Quality*. Master's thesis, Ulm University, June 2013.
- [12] DungPhamTuan. *Deterministic Sensing Matrices Based on Algebraic Curves*. Master's thesis, Ulm University, June 2013.
- [13] Matthias Düll. *EMV-toleranter Empfang von OFDM-basierten Rundfunksignal*. Master's thesis, Ulm University, Aug. 2012.
- [14] Robert ElChab. *Evaluation of Statistical Models for User Satisfaction and Interaction Quality Classification*. Master's thesis, Ulm University, May 2012.
- [15] Georg Fischer. *Decoding Techniques for interleaved generalized Reed-Solomon Codes*. Master's thesis, Ulm University, June 2012.
- [16] Harris Hafeez. *On Algorithms Decoding Reed-Solomon Codes Beyond Half The Minimum Distance*. Master's thesis, Ulm University, Dec. 2011.
- [17] Mario Hermanutz. *Entwicklung von Sprachdialogkonzepten für den Einsatz bei proaktivem Systemverhalten im Fahrzeug*. Master's thesis, Ulm University, June 2013.
- [18] Mohamed Ibrahim. *Compressive Sensing for Ultra Wideband Channel Estimation*. Master's thesis, Ulm University, June 2012.
- [19] Lianghai Ji. *Implementation and Analysis of the Wireless Communication System OFDM-IDMA*. Master's thesis, Ulm University, Apr. 2012.
- [20] Qian Jiang. *A Simulative Study of Modern Error/Erase Decoding Schemes*. Master's thesis, Ulm University, Oct. 2011.
- [21] Peter Kabiri. *Fast Euclidean Algorithm for Multi-Sequence Shift Register Synthesis*. Master's thesis, Ulm University, Nov. 2013.
- [22] Ahmed Mansour. *Evaluation of Entropy Estimators, Improvements and Comparison*. Master's thesis, Ulm University, July 2012.
- [23] Amr Shafik Mohamed. *Discrete Compressive Sensing Recovery Algorithms*. Master's thesis, Ulm University, July 2013.
- [24] Mostafa Mohamed. *Construction and Decoding of Rank-Metric Based Multi-Memory Codes*. Master's thesis, Ulm University, Mar. 2012.
- [25] Omar Mohamed. *Transmit Strategies for MIMO Multi-User Systems with Multi-Antenna Amplify-and-Forward Relays*. Master's thesis, Ulm University, Apr. 2012.

- [26] Sherif Mohamed. *Investigation of high-order recurrent neural networks as continuous decoder*. Master's thesis, Ulm University, July 2012.
- [27] Thomas Morawetz. *Niedrigenergie-Datenübertragung am Beispiel einer Temperaturerfassung*. Master's thesis, Ulm University, Nov. 2013.
- [28] Ahmed Lotfy Yonis Radwan. *Measurement Matrices Based on Spherical Codes for Compressed Sensing*. Master's thesis, Ulm University, July 2012.
- [29] Martin Schießl. *MEMS Mikrofon Arrays für Freisprechen*. Master's thesis, Ulm University, Feb. 2013.
- [30] Alexander Schneider. *Sendestrategien im kognitiven MIMO-Funkkanal mit einem nicht adaptiven Primärsystem*. Master's thesis, Ulm University, Oct. 2012.
- [31] Mina Shehata. *Concatenated Compressed Sensing-Based Error Correcting Codes*. Master's thesis, Ulm University, June 2012.
- [32] Sebastian Stern. *Vergleich des Spitzenwertverhaltens von Ein- und Mehrträgerverfahren*. Master's thesis, Ulm University, Nov. 2012.
- [33] Jinchun Sun. *Assessment of Peak-to-Average Power Ratio Reduction Schemes Utilizing Receiver-Side Reconstruction via Compressed Sensing*. Master's thesis, Ulm University, May 2013.
- [34] Markus Ulmschneider. *Nonbinary Small-Minimum-Distance Cyclic Codes for Bounding the Minimum Distance of Cyclic Codes*. Master's thesis, Ulm University, Oct. 2013.
- [35] Tianyi Wang. *Submanifold Learning for Head Pose Estimation*. Master's thesis, Ulm University, Mar. 2012.
- [36] Florian Wäckerle. *Verwendung von Compressed Sensing zur Spitzenwertreduktion und zur Behandlung von Clipping-Effekten in OFDM*. Master's thesis, Ulm University, June 2012.
- [37] Kotchapol Yoosooksawat. *Reconstruction Algorithms for Sensing Matrices Based on Cyclic Codes*. Master's thesis, Ulm University, June 2013.
- [38] Jing Zhang. *A user-adaptive nature language generation system*. Master's thesis, Ulm University, Apr. 2012.

9.3 Bachelor Theses

- [1] Andreas Braun. *Vergleich von diskreten Rekonstruktionsalgorithmen für "Compressed Sensing"*. Bachelor's thesis, Ulm University, Oct. 2013.
- [2] Matthias Führle. *Error-Erasure Decoding of Gabidulin Codes for Network Coding*. Bachelor's thesis, Ulm University, Oct. 2013.
- [3] Thomas Jerkovits. *Comparison of Bounds on the Minimum Distance of Cyclic Codes*. Bachelor's thesis, Ulm University, Sep. 2012.

- [4] Juliana Miehle. *Investigation of shadow ORFS with Interploated Markov Models*. Bachelor's thesis, Ulm University, Dec. 2013.
- [5] Sven Puchinger. *Improved Decoding of Partial Unit Memory Codes Using List Decoding of Reed-Solomon Codes*. Bachelor's thesis, Ulm University, July 2012.
- [6] David Röder. *Untersuchung des Einflusses des Guard-Intervalls auf das Spitzenwertverhalten von OFDM*. Bachelor's thesis, Ulm University, Oct. 2013.

9.4 Student Research Projects (Studienarbeiten)

- [1] Simon Lüke. *Investigation of the Error Propagation in Regulatory Boolean Networks*. Student research project, Ulm University, Dec. 2013.
- [2] Michael Scholz. *Lineare Modellisierung vs. Sliding-Windows Modellierung zur Prädiktion des Dialogausgangs in Sprachdialogsystemen*. Student research project, Ulm University, May 2013.
- [3] Gero Viertel. *Validierung eines Verbundmodells von Transkriptions- und metabolischem Netzwerk von Escherichia Coli*. Student research project, Ulm University, Feb. 2012.
- [4] Paul Wallner. *Untersuchung der Leistungsfähigkeit iterativer Empfangsverfahren mit Relaxationsparameter für ein auf Gruppen orthogonaler Spreizcodes bestehendes Übertragungsverfahren*. Student research project, Ulm University, Apr. 2012.

10 Conferences and Meetings

The following conferences were organized and/or hosted by members of our institute:

- **9th International Workshop on Computational Systems Biology (WSCB 2012)**
June 4.–6., 2012, Ulm, Germany
The workshop should bring together researchers from biology and information theory for discussions. The workshops accompanies the DFG priority program InKoMBio (SPP 1397). Well known international researchers from both fields are invited speakers.
- **DFG Priority Program “InKoMBio” (SPP 1395)**
Oct. 18.–19., 2012, FRIAS Freiburg University, Berichtskolloquium InKoMBio (SPP 1395/2)
Oct. 14., 2013, Ulm University, Antragskolloquium InKoMBio (SPP 1395/3)
These meetings have been coordinated for the DFG Priority Program “InKoMBio” (SPP 1395). The meeting at Freiburg University have been jointly organized with Prof. Backofen and Prof. Palme (Freiburg).
- **ITG-Fachgruppe “Bioinformations Theorie”**
Apr. 17.–19., 2013, Martin Luther University of Halle-Wittenberg, Workshop: “Gene Regulation and Information Theory”
The workshop has been jointly organized with Prof. Große and Prof. Breunig, University of Halle-Wittenberg. Further information are available online.
- **ITG-Fachgruppe “Angewandte Informationstheorie”**
Oct. 08., 2013, Ulm University, focus: “Channel Coding and Compressed Sensing”
The workshop has been jointly organized with Dr. Wübben, University Bremen. Further information are available online.
- **Status Meeting “ADVAntage-Net”**
Oct. 23., 2013, Ulm University
The meeting has been jointly organized with Dr. Eiselt, ADVA Optical Networking, Meiningen.

11 Academics

The members of the institute are active in various committees and at the university self-administration.

Prof. Martin Bossert

- Member of *Leopoldina, Deutsche Akademie der Wissenschaften*
- Member of *Board of Governors IEEE Information Theory Society*
- DFG-Fachkollegiat Nachrichtentechnik
- Vice Dean of the Faculty of Engineering and Computer Science
- Member of *Fakultätsrat*
- Member of *Commission for Student Affairs*
- Head of *Promotionsausschuss Dr.-Ing.*
- Head of *Habilitationsausschuss*
- Head of *Verein zur Förderung mathematisch begabter Jugendlicher*
- Member of *Commission VDE Colloquium*
- Member of *ITG-Fachausschuss 5.1 Informations- und Systemtheorie*

Prof. Robert Fischer

- Associate Editor *IEEE Transactions on Information Theory*
- Associate Editor *International Journal of Electronics and Communications (AEÜ)*
- Member of *Studienkommission "Elektrotechnik"*
- Member of *Admission Board for the International Master Course "Communications Technology"*
- Member of *Habilitationsausschuss*
- Member of *Selection Committee for the Argus Award*
- Member of *ITG-Fachausschuss 5.1 Informations- und Systemtheorie*

Prof. Wolfgang Minker

- Head of *Industrial Internship Office*
- Member of *Admission Board of the joint B.Sc./M.Sc. Programme “Informationssystemtechnik”*
- Member of *GUC Advisory Board*

Prof. Jürgen Lindner

- Member of *Board of Trustees of the Eduard Rhein Foundation*

Dr. Werner Teich

- Member of *Studienkommission “Informationssystemtechnik”*
- Member of *Prüfungskommission “Elektrotechnik”, “Informationssystemtechnik”, and “Communications Technology”*
- Member of *Admission Boards for the Master Courses “Elektrotechnik”, “Informationssystemtechnik”, and the International Master Course “Communications Technology”*
- Student Advisor *“Elektrotechnik”, “Informationssystemtechnik”, and “Communications Technology”*

Ulrike Stier

- Member of *Fakultätsrat*