

# Activity Report 2011–2013

Institute of Communications Engineering

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## Impressum

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Dezember 2013

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## Preface

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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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### Professors

|                                    |                                                                            |
|------------------------------------|----------------------------------------------------------------------------|
| Prof. Dr.-Ing. Martin Bossert      | <a href="mailto:martin.bossert@uni-ulm.de">martin.bossert@uni-ulm.de</a>   |
| Prof. Dr.-Ing. Robert Fischer      | <a href="mailto:robert.fischer@uni-ulm.de">robert.fischer@uni-ulm.de</a>   |
| Prof. Dr. Dr.-Ing. Wolfgang Minker | <a href="mailto:wolfgang.minker@uni-ulm.de">wolfgang.minker@uni-ulm.de</a> |

#### Associated and Retired Professors

|                                   |                                                                                      |
|-----------------------------------|--------------------------------------------------------------------------------------|
| Prof. Dr.-Ing. Uwe-Carsten Fiebig | <a href="mailto:uwe.fiebig@dlr.de">uwe.fiebig@dlr.de</a>                             |
| Prof. Dr. Hans Peter Großmann     | <a href="mailto:hans-peter.grossmann@uni-ulm.de">hans-peter.grossmann@uni-ulm.de</a> |
| Prof. Dr.-Ing. Jürgen Lindner     | <a href="mailto:juergen.lindner@uni-ulm.de">juergen.lindner@uni-ulm.de</a>           |

### Secretary

|              |                                                                      |
|--------------|----------------------------------------------------------------------|
| Ulrike Stier | <a href="mailto:ulrike.stier@uni-ulm.de">ulrike.stier@uni-ulm.de</a> |
| Ilse Walter  | <a href="mailto:ilse.walter@uni-ulm.de">ilse.walter@uni-ulm.de</a>   |

### Technical Staff

|                             |                                                                        |
|-----------------------------|------------------------------------------------------------------------|
| Werner Birkle               | <a href="mailto:werner.birkle@uni-ulm.de">werner.birkle@uni-ulm.de</a> |
| Dipl.-Ing. (FH) Werner Hack | <a href="mailto:werner.hack@uni-ulm.de">werner.hack@uni-ulm.de</a>     |
| Heike Schewe                | <a href="mailto:heike.schewe@uni-ulm.de">heike.schewe@uni-ulm.de</a>   |

### Senior Researcher

|                               |                                                                                  |
|-------------------------------|----------------------------------------------------------------------------------|
| Dr.-Ing. Vahid Forutan        | <a href="mailto:vahid.forutan@uni-ulm.de">vahid.forutan@uni-ulm.de</a>           |
| Dr.-Ing. Carolin Huppert      | (until 07/13)                                                                    |
| Dr.-Ing. Dejan Lazich         | (until 05/13)                                                                    |
| Dr. Sandra Mann               | (04/13–09/13)                                                                    |
| Dr. Johan S.R. Nielsen, M.Sc. | <a href="mailto:johan.nielsen@uni-ulm.de">johan.nielsen@uni-ulm.de</a>           |
| Dr.-Ing. Steffen Schober      | <a href="mailto:steffen.schober@uni-ulm.de">steffen.schober@uni-ulm.de</a>       |
| Dr.-Ing. Christian Senger     | (until 03/13)                                                                    |
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| Dr. rer. nat. Werner Teich    | <a href="mailto:werner.teich@uni-ulm.de">werner.teich@uni-ulm.de</a>             |

## Research Assistants

|                                    |                               |
|------------------------------------|-------------------------------|
| Dipl.-Inf. Gregor Bertrand         | (until 05/13)                 |
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| Dipl.-Ing. Sebastian Heinrichs     | (06/12–05/13)                 |
| Dipl.-Inf. Tobias Heinroth         | (until 06/12)                 |
| Hansjörg Hofmann, M.Sc.            | hansjoerg.hofmann@daimler.com |
| Dipl.-Ing. Sabine Kampf            | (until 02/12)                 |
| Dipl.-Ing. Johannes Klotz          | johannes.klotz@uni-ulm.de     |
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| Dipl.-Inf. Helmut Lang             | (until 05/13)                 |
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| Dipl.-Ing. Susanne Sparrer         | susanne.sparrer@uni-ulm.de    |
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| Thanawat Thiasiriphet, M.Sc.       | (until 05/13)                 |
| Dipl.-Inf. Stefan Ultes            | stefan.ultes@uni-ulm.de       |
| Antonia Wachter-Zeh, M.Sc.         | (until 10/13)                 |
| Florian Wäckerle, M.Sc.            | florian.waeckerle@uni-ulm.de  |
| Kseniya Zablotskaya, M.Sc.         | (until 10/12)                 |
| Sergey Zablotskiy, M.Sc.           | (until 02/13)                 |
| Dipl.-Ing. Ing. ENST Alexander Zeh | (until 10/13)                 |
| Dipl.-Ing. Henning Zörlein         | henning.zoerlein@uni-ulm.de   |

## 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, Helmut Lang, Alexander Schmitt 06/2012
- **University of Granada, Spain**  
Wolfgang Minker, Stefan Ultes, Helmut Lang, Alexander Schmitt 11/2012
- **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, Maxim Sidorov, Sergey Zablotskiy 01/2013
- **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, Tatiana Gasanova, Maxim Sidorov, Dmitry Zaykovskiy 09/2013
- **University of Granada, Spain**  
Wolfgang Minker, Stefan Ultes 11/2013

## 3 Awards

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- **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

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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)

**Multuser 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"; Multuser 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).<sup>1</sup>

- **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 Transcriptional 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**

<sup>1</sup>SPP: “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

■ **Analog 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](http://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 21st 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.
- [11] Sabine Kampf. Bounds on Collaborative Decoding of Interleaved Hermitian Codes and Virtual Extension. *3ICMCTA Special Issue of Designs, Codes and Cryptography*, Vol. , 2012.
- [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.
- [13] Johannes G. Klotz, Martin Bossert, Steffen Schober. On the Predecessor Problem in Boolean Network Models of Regulatory Networks. *International Journal of Computers and Applications IJCA*, Vol. 19, No. 2, 2012.
- [14] Johannes G. Klotz, Martin Bossert, Steffen Schober. Computing preimages of Boolean networks. *BMC Bioinformatics*, Vol. 14, No. Suppl 10, pp. S4, 2013.
- [15] Johannes G. Klotz, Martin Bossert, Steffen Schober. On the Noise Sensitivity and Mutual Information of (Nested-) Canalizing Boolean Functions. In *Proceedings of the IEEE Information Theory Workshop 2013.*, Sep. 2013.
- [16] Johannes G. Klotz, Ronny Feuer, Oliver Sawodny, Martin Bossert, Michael Ederer, Steffen Schober. Properties of Boolean networks and methods for their tests. *EURASIP Journal on Bioinformatics and Systems Biology*, Vol. 2013, No. 1, pp. 1,

- 2013.
- [17] Johannes G. Klotz, Reinhard Heckel, Steffen Schober. Bounds on the Average Sensitivity of Nested Canalizing Functions. *PLoS ONE*, Vol. 8, No. 5, pp. e64371, 2013.
  - [18] Johannes G. Klotz, David Kracht, Martin Bossert, Steffen Schober. Canalizing Boolean Functions Maximize the Mutual Information. In *Proc. 9th International ITG Conference on Systems, Communications and Coding 2013*, Jan. 2013.
  - [19] Johannes G. Klotz, Gero Viertel, Ronny Feuer, Katrin Gottlieb, Oliver Sawodny, Georg A. Sprenger, Martin Bossert, Michael Ederer, Steffen Schober. Prediction of Regulatory Impact Under Defined Environmental Conditions Based on a Combination of Metabolic and Transcriptional Networks. In *Proc. 9th International Workshop on Computational Systems Biology (WCSB 2012)*, Ulm, Germany, June 2012. accepted.
  - [20] Frederic Knabe, Carolin Huppert. Reducing the Receiver Complexity by Applying Tomlinson-Harashima Precoding in Quantized Broadcast Channels. In *Proc. 8th International Symposium on Wireless Communication Systems*, Aachen, Germany, Nov. 2011.
  - [21] Frederic Knabe, Omar Mohamed, Carolin Huppert. Achievable Sum-Rates in Gaussian Multiple-Access Channels with MIMO-AF-Relay and Direct Links. In *2012 IEEE Information Theory Workshop*, pp. 447–451. IEEE, Sep. 2012.
  - [22] Frederic Knabe, Omar Mohamed, Carolin Huppert. Superiority of TDMA in a Class of Gaussian Multiple-Access Channels with a MIMO-AF-Relay. In *2012 International Symposium on Wireless Communication Systems (ISWCS)*, pp. 621–625. IEEE, Aug. 2012.
  - [23] Antti Larrjo, Steffen Schober, Muhammad Farhan, Martin Bossert, Olli Yli-Harja, editors. *Proceedings of the 9th International Workshop on Computational Systems Biology, WCSB 2012*, number 61 in TICSP Series, Tampere, 2012. Tampere International Center for Signal Processing.
  - [24] Dejan E. Lazich, Henning Zörlein, Martin Bossert. Low Coherence Sensing Matrices Based on Best Spherical Codes. In *Proceedings of 9th International ITG Conference on Systems, Communication and Coding (SCC)*, Munich, Germany, Jan. 2013.
  - [25] Wenhui Li. On Syndrome Decoding of Chinese Remainder Codes. In *The 13th Int. Workshop on Algebraic and Combinatorial Coding Theory*, 2012.
  - [26] Wenhui Li, Vladimir R. Sidorenko. On the error-eraser-decoder of the Chinese remainder codes. In *Problems of Redundancy in Inform. and Control Systems, XIII Int. Symposium on*, pp. 37–40. IEEE, 2012.
  - [27] Wenhui Li, Vladimir R. Sidorenko, Di Chen. On transform-domain decoding of Gabidulin codes. In *The International Workshop on Coding and Cryptography (WCC 13)*, pp. 37–40, Apr. 2013.
  - [28] Wenhui Li, Vladimir R. Sidorenko, Johan S. R. Nielsen. On Decoding Interleaved Chinese Remainder Codes. In *IEEE International Symposium on Information Theory (ISIT 13)*, July 2013.
  - [29] Markus Maucher, David Kracht, Steffen Schober, Martin Bossert, Hans A. Kestler. Inferring Boolean functions via higher-order correlations. *Computational Statistics*, Vol. , pp. 1–19, 2012.
  - [30] Katharina Mir, Klaus Neuhaus, Siegfried Scherer, Martin Bossert, Steffen Schober. Predicting Statistical Properties of Open Reading Frames in Bacterial Genomes. *PLoS ONE*, Vol. 7, No. 9, pp. e45103, 2012.
  - [31] Steffen Schober. Some Worst-Case Bounds for Bayesian Estimators of Discrete Distributions. In *Proc IEEE International Symposium on Information Theory 2013*, Istanbul, Turkey, July 2013.
  - [32] Steffen Schober, David Kracht, Reinhard Heckel, Martin Bossert. Detecting controlling nodes of boolean regulatory networks. *EURASIP Journal on Bioinformatics & Systems Biology*, Vol. 2011, No. 1, pp. 6, 2011. PMID: 21989141.
  - [33] Steffen Schober, Ahmed Mansour. On the Estimation of Entropy for Unknown Support Size. In *Proc. IEEE Information Theory Workshop 2012 (ITW 2012)*, Lausanne, Switzerland, Sep. 2012.
  - [34] Steffen Schober, Katharina Mir, Klaus Neuhaus, Martin Bossert. Design of Short Barcodes for Next Generation Sequencing of DNA and RNA. In *Proc. 2012 IEEE International Workshop on Genomic Signal Processing and Statistics (GENSIPS'12)*, Washington, DC, US, Dec. 2012.
  - [35] Christian Senger. The periodicity transform in algebraic decoding of Reed–Solomon codes. In *Communication, Control, and Computing (Allerton), 2012 50th Annual Allerton Conference on*, pp. 168–175. IEEE, Oct. 2012.
  - [36] Christian Senger, Alexander Zeh, Fan Yu, Steffen Schober. Adaptive End-to-End Network Coding based on Algebraic Codes. In *First International Workshop on Performance Evaluation and Modeling in Wireless Networks (PEMWN2012)*, Tunis, Tunisia, Nov. 2012.
  - [37] Vladimir R. Sidorenko, Martin Bossert. Fast skew-feedback shift-register synthesis. *Designs, Codes and Cryptography*, Vol. , pp. 1–13, 2012.
  - [38] Vladimir R. Sidorenko, Martin Bossert, Francesca Vatta. Properties and encoding aspects of direct product convolutional codes. In *Information Theory Proceedings (ISIT), 2012 IEEE International Symposium on*, pp. 2351–2355, 2012.
  - [39] Vladimir R. Sidorenko, Robert F. H. Fischer. Low-Complexity List Decoding of Reed-Solomon Coded Pulse Position Modulation. *ITG-Fachbericht-SCC 2013*,

- Vol. , 2013.
- [40] Vladimir R. Sidorenko, Antonia Wachter-Zeh, Di Chen. On fast decoding of interleaved Gabidulin codes. In *Problems of Redundancy in Information and Control Systems (RED)*, 2012 XIII International Symposium on, pp. 78–83, 2012.
  - [41] Vladimir R. Sidorenko, Antonia Wachter-Zeh, Di Chen. On fast Decoding of Interleaved Gabidulin Codes. In *Int. Symp. Probl. Redundancy Inf. Control Systems*, pp. 78–83, Sep. 2012.
  - [42] Antonia Wachter-Zeh. Bounds on List Decoding Gabidulin Codes. In *Int. Workshop Alg. Combin. Coding Theory (ACCT)*, pp. 329–334, June 2012.
  - [43] Antonia Wachter-Zeh. Bounds on List Decoding of Rank Metric Codes. *accepted for IEEE Trans. Inform. Theory*, Vol. , 2013.
  - [44] Antonia Wachter-Zeh. Bounds on Polynomial-Time List Decoding of Rank Metric Codes. In *IEEE Int. Symp. Inf. Theory (ISIT)*, July 2013.
  - [45] Antonia Wachter-Zeh, Valentin Afanassiev, Vladimir R. Sidorenko. Fast Decoding of Gabidulin Codes. *Des. Codes Cryptogr.*, Vol. 66, No. 1, pp. 57–73, 2013.
  - [46] Antonia Wachter-Zeh, Vladimir R. Sidorenko. Rank Metric Convolutional Codes for Random Linear Network Coding. In *IEEE Int. Symp. Network Coding (Netcod)*, July 2012.
  - [47] Antonia Wachter-Zeh, Markus Stinner, Martin Bossert. Efficient Decoding of Partial Unit Memory Codes of Arbitrary Rate. In *IEEE Int. Symp. Inf. Theory (ISIT)*, pp. 2356–2360, July 2012.
  - [48] Antonia Wachter-Zeh, Alexander Zeh. Interpolation-Based Decoding of Interleaved Gabidulin Codes. In *Int. Workshop Coding Cryptogr. (WCC)*, Apr. 2013.
  - [49] Antonia Wachter-Zeh, Alexander Zeh, Martin Bossert. Decoding Interleaved Reed-Solomon Codes Beyond Their Joint Error-Correcting Capability. *accepted for Des. Codes Cryptogr.*, Vol. , 2012.
  - [50] Jos H. Weber, Vladimir R. Sidorenko, Christian Senger, Khaled A. S. Abdel-Ghaffar. Asymptotic Single-Trial Strategies for GMD Decoding with Arbitrary Error-Erasure Tradeoff. *Problems of Information Transmission*, Vol. 48, No. 4, pp. 324–333, 2012.
  - [51] Rafael Wyrembelski, Aydin Sezgin, Holger Boche. Secrecy in Broadcast Channels with Receiver Side Information. In *Proceedings of 2011 Asilomar Conference on Signals, Systems, and Computers*, St. Pacific Grove, USA, November 2011.
  - [52] Alexander Zeh, Sergey V. Bezzateev. Describing a Cyclic Code by Another Cyclic Code. In *IEEE International Symposium on Information Theory (ISIT)*, pp. 2896–2900, Boston, USA, July 2012.
  - [53] Alexander Zeh, Sergey V. Bezzateev. A New Bound on the Minimum Distance of Cyclic Codes Using Small-Minimum-Distance Cyclic Codes. *Designs, Codes and Cryptography*, Vol. , pp. 1–18, 2012.
  - [54] Alexander Zeh, Sergey V. Bezzateev. A New Error and Erasure Decoding Approach for Cyclic Codes. In *International Workshop on Algebraic and Combinatorial Coding Theory (ACCT)*, Pomorie, Bulgaria, 2012.
  - [55] Alexander Zeh, Antonia Wachter, Martin Bossert. Unambiguous Decoding of Generalized Reed–Solomon Codes Beyond Half the Minimum Distance. In *International Zurich Seminar (IZS)*, pp. 63–66, Zurich, Switzerland, 2012.
  - [56] Alexander Zeh, Antonia Wachter-Zeh, Sergey V. Bezzateev. Decoding Cyclic Codes up to a New Bound on the Minimum Distance. *IEEE Trans. Inform. Theory*, Vol. 58, No. 6, pp. 3951–3960, 2012.
  - [57] Alexander Zeh, Antonia Wachter-Zeh, Maximilien Gadouleau, Sergey V. Bezzateev. Generalizing Bounds on the Minimum Distance of Cyclic Codes Using Cyclic Product Codes. In *IEEE Int. Symp. Inf. Theory (ISIT)*, July 2013.
  - [58] Henning Zörlein, Akram Faisal, Martin Bossert. Dictionary Adaptation in Sparse Recovery Based on Different Types of Coherence. In *Proceedings of 2nd International Workshop on Compressed Sensing applied to Radar (CoSeRa)*, Bonn, Germany, Sep. 2013.
  - [59] Henning Zörlein, Dejan E. Lazich, Martin Bossert. Performance of Error Correction Based on Compressed Sensing. In *Proceedings of 8th International Symposium on Wireless Communication Systems (ISWCS)*, pp. 301–305, Aachen, Germany, Nov. 2011.
  - [60] Henning Zörlein, Dejan E. Lazich, Martin Bossert. On the Noise-Resilience of OMP with BASC-Based Low Coherence Sensing Matrices. In *Proceedings of 10th international conference on Sampling Theory and Applications (SampTA)*, pp. 468–471, Bremen, Germany, July 2013.
  - [61] Henning Zörlein, Mina Shehata, Martin Bossert. Concatenated Compressed Sensing-Based Error Correcting Codes. In *Proceedings of 9th International ITG Conference on Systems, Communication and Coding (SCC)*, Munich, Germany, Jan. 2013.

## Publications by Prof. Fischer's Group

### Books and Book Chapters

- [1] Robert F.H. Fischer, Christian Siegl. Peak-to-Average Power Ratio Reduction in Multi-Antenna Scenarios. In H. Rohling, editor, *OFDM — Concepts for Future Communication Systems*, Signals and Communication Technology, pp. 69–80. Springer Verlag, Berlin, Heidelberg, 2011.
- [2] Robert F.H. Fischer, Clemens Stierstorfer. Single- vs. Multicarrier Transmission in MIMO and Multiuser Scenarios. In H. Rohling, editor, *OFDM — Concepts for Future Communication Systems*, Signals and Communication Technology, pp. 81–89. Springer Verlag, Berlin, Heidelberg, 2011.
- [3] Andreas Schenk, Robert F.H. Fischer. Coding, Modulation and Detection for Power-Efficient Low-Complexity Receivers in Impulse-Radio Ultra Wideband Transmission Systems. In T. Zwick, R. Thomä, H. Willms, editors, *UKoLoS — Ultra-Wideband Radio Technologies for Communications, Localization and Sensor Applications*, pp. 123–132. Intech, Mar. 2013.

### Journal and Conference Papers

- [1] Michael Cyran, Robert F.H. Fischer, Johannes B. Huber. Selection Precoding for the Finite-Field Multiplicative Matrix Channel. *IEEE Communications Letters*, to be published. 2013.
- [2] Robert F.H. Fischer. Complexity-Performance Trade-Off of Algorithms for Combined Lattice Reduction and QR Decompositions. *International Journal of Electronics and Communications (AEÜ)*, Vol. 66, No. 11, pp. 871–879, 2012.
- [3] Robert F.H. Fischer, Sebastian Heinrichs. The Network MIMO Downlink with Per-Antenna Power Constraint: Linear Preequalization vs. Tomlinson-Harashima Precoding. In *Proceedings of International ITG/IEEE Workshop on Smart Antennas (WSA)*, Mar. 2013.
- [4] Robert F.H. Fischer, Florian Wäckerle. Peak-to-Average Power Ratio Reduction in OFDM via Sparse Signals: Transmitter-Side Tone Reservation vs. Receiver-Side Compressed. In *Proceedings of 16. International OFDM Workshop (InOWo)*, Aug. 2012.
- [5] Robert F.H. Fischer, Christoph Windpassinger, Clemens Stierstorfer, Christian Siegl, Andreas Schenk, Ümit Abay. Lattice-Reduction-Aided MMSE Equalization and the Successive Estimation of Correlated Data. *International Journal of Electronics and Communications (AEÜ)*, Vol. 65, No. 8, pp. 688–693, 2011.

- [6] Alexey Frolov, Victor Zyablov, Vladimir Sidorenko, Robert F.H. Fischer. On a Multiple-Access in a Vector Disjunctive Channel. In *Proceedings of International Symposium on Information Theory (ISIT)*, July 2013.
- [7] Andreas Schenk, Robert F.H. Fischer. Design Rules for Bit-Interleaved Coded Impulse-Radio Ultra-Wideband Modulation with Autocorrelation-Based Detection. In *Proceedings of IEEE International Symposium on Wireless Communication Systems (ISWCS)*, pp. 146–150, Aachen, Germany, Nov. 2011.
- [8] Andreas Schenk, Robert F.H. Fischer. Low-Complexity Soft-Output Detection for Impulse-Radio Ultra-Wideband Systems Via Combining Multiple Observations. In *Proceedings of International Zurich Seminar (IZS)*, pp. 119–122, Zurich, Switzerland, Mar. 2012.
- [9] Andreas Schenk, Robert F.H. Fischer. Noncoherent Detection in Massive MIMO Systems. In *Proceedings of International ITG/IEEE Workshop on Smart Antennas (WSA)*, Stuttgart, Germany, Mar. 2013.
- [10] Andreas Schenk, Robert F.H. Fischer, Johannes B. Huber. Performance Estimation of Bit-Interleaved Coded Modulation Based On Information Processing Characteristics. In *Proceedings of International Symposium on Information Theory (ISIT)*, pp. 2416–2420, Cambridge, USA, July 2012.
- [11] Mathis Seidl, Michael Cyran, Robert F.H. Fischer, Johannes B. Huber. A Differential Encoding Approach to Random Linear Network Coding. In *Proceedings of 9. International ITG Conference on Systems, Communications and Coding (SCC)*, Munich, Germany, Jan. 2013.
- [12] Vladimir Sidorenko, Robert F.H. Fischer. Low-Complexity List Decoding of Reed-Solomon Coded Pulse Position Modulation. In *Proceedings of International ITG Conference on Systems, Communications and Coding (SCC)*, Munich, Germany, Jan. 2013.
- [13] Susanne Sparrer, Robert F.H. Fischer. Discrete Compressed Sensing Algorithms. Poster presentation at *Matheon Workshop on Compressed Sensing and its Applications 2013*, Berlin, Dec. 2013.
- [14] Susanne Sparrer, Andreas Schenk, Robert F.H. Fischer. Communication Over Impulsive Noise Channels: Channel Coding vs. Compressed Sensing. In *Proceedings of 9. International ITG Conference on Systems, Communications, and Coding (SCC)*, Munich, Germany, Jan. 2013.
- [15] Sebastian Stern, Robert F.H. Fischer. Efficient Assessment of the Instantaneous Power Distributions of Pulse-Shaped Single- and Multi-Carrier Signals. In *Proceedings of International Black Sea Conference on Communications and Networking (BlackSeaCom)*, July 2013.
- [16] Florian Wäckerle, Sebastian Stern, Robert F.H. Fischer. Iterative Bit and Power

Loading for Coherent Optical OFDM to Account for Fiber Nonlinearities. In *Proceedings of European Conference and Exhibition on Optical Communication (ECOC)*, Sep. 2013.

- [17] Gerhard Wunder, Robert F.H. Fischer, Holger Boche, Simon Litsyn, Jong-Seon No. The PAPR Problem in OFDM Transmission: New Directions for a Long-Lasting Problem. *IEEE Signal Processing Magazine*, Vol. 30, No. 6, pp. 130–144, 2013.

## Publications by Prof. Lindner's Group

### Books and Book Chapters

- [1] Dayang Lin, Michael Mirbach, Thanawat Thiasiriphet, Jürgen Lindner, Wolfgang Menzel, Hermann Schmachter, Mario Leib, Bernd Schleicher. UWB in Medicine — High Performance UWB Systems for Biomedical Diagnostics and Short Range Communications. In T. Zwick, R. Thomä, H. Willms, editors, *UKoLoS — Ultra-Wideband Radio Technologies for Communications, Localization and Sensor Applications*, pp. 439–488. Intech, Mar. 2013.
- [2] Jürgen Lindner. Spreading. In H. Rohling, editor, *OFDM — Concepts for Future Communication Systems*, Signals and Communication Technology, pp. 47–53. Springer Verlag, Berlin, Heidelberg, 2011.
- [3] Mohamad Mostafa, Werner G. Teich, Jürgen Lindner. Stability analysis of vector equalization based on recurrent neural networks. In Kyandoghere Kyamakya, Wolfgang A. Halang, Wolfgang Mathis, Jean Camberlain Chedjou, Zhong Li, editors, *Selected topics in nonlinear dynamics and theoretical electrical engineering*, Vol. 459 of *Studies in Computational Intelligence*, chapter 18, pp. 329–349. Springer Berlin Heidelberg, 2013.
- [4] Werner G. Teich, Christian Pietsch. Transmit Diversity and Space-Time Block Coding. In Roberto Verdone, Alberto Zanella, editors, *Pervasive Mobile and Ambient Wireless Communications — COST Action 2100*, chapter 7.6, pp. 329–334. Springer-Verlag, London, 2012.
- [5] Werner G. Teich, Matthias Wetz. Iterative Techniques. In Roberto Verdone, Alberto Zanella, editors, *Pervasive Mobile and Ambient Wireless Communications — COST Action 2100*, chapter 9.2, pp. 380–386. Springer-Verlag, London, 2012.

### Journal and Conference Papers

- [1] Nardine Farah, Eva Peiker-Feil, Werner G. Teich, Jürgen Lindner. Comparison of CDD and MC-CAFS for the MIMO-OFDM DL in LTE. In *IC 1004 4th MC and*

*Scientific Meeting*, Lyon, France, 2012.

- [2] Ji Lianghai, Werner G. Teich. An Improved Chip Detector for OFDM-IDMA over Fast Time-Variant Channels. In *10th International Symposium on Wireless Communication Systems (ISWCS'13)*, August 27–30, 2013, Aug. 2013.
- [3] Mohamad Mostafa, Werner G. Teich, Jürgen Lindner. Analysis of high order recurrent neural networks for analog decoding. In *7th International Symposium on Turbo Codes and Iterative Information Processing ISTC*, pp. 116–120, Gothenburg, Sweden, Aug. 2012.
- [4] Mohamad Mostafa, Werner G. Teich, Jürgen Lindner. Vector equalization based on continuous-time recurrent neural networks. In *6th International Conference on Signal Processing and Communication Systems ICSPCS*, Gold Coast, Australia, Dec. 2012.
- [5] Mohamad Mostafa, Werner G. Teich, Jürgen Lindner. Comparison of belief propagation and iterative threshold decoding based on dynamical systems. In *IEEE International Symposium on Information Theory ISIT*, Istanbul, Turkey, July 2013.
- [6] Mohamad Mostafa, Werner G. Teich, Jürgen Lindner. Local stability analysis of discrete-time, continuous-state, complex-valued recurrent neural networks with inner state feedback. Accepted in *IEEE Transactions on Neural Networks and Learning Systems TNNLS*, Vol. , 2013.
- [7] Eva Peiker-Feil, Werner G. Teich, Jürgen Lindner. Extending the Bandwidth Efficiency of OFDM-MFSK. In *IC 1004 6th MC and Scientific Meeting*, TD(13)06046, Malaga, Spain 2013, February 2013.
- [8] Eva Peiker-Feil, Matthias Wetz, Werner G. Teich. OFDM-MFSK as a Special Case of Noncoherent Communication Based on Subspaces. In *Proc. 17th International OFDM Workshop 2012 (InOWo'12)*, pp. 1–5, Essen, Germany, August 2012.
- [9] Eva Peiker-Feil, Matthias Wetz, Werner G. Teich. OFDM-MFSK as a Special Case of Noncoherent Communication Based on Subspaces. In *IC 1004 5th MC and Scientific Meeting*, TD(12)05017, Bristol, Great Britain, September 2012.
- [10] Werner G. Teich, Paul Wallner. Soft Iterative Interference Cancellation with Successive Over Relaxation for Digital Transmission Schemes based on Multiple Sets of Orthogonal Spreading Codes. In *6th International Conference on Signal Processing and Communication Systems (ICSPCS)*, Australia, Gold Coast, Dec. 2012.
- [11] Werner G. Teich, Paul Wallner. Soft Iterative Interference Cancellation with Successive Over Relaxation for Digital Transmission Schemes based on Multiple Sets of Orthogonal Spreading Codes. In *IC 1004 6th MC and Scientific Meeting*, Malaga, Spain, 2013.
- [12] Thanawat Thiasiriphet, Jürgen Lindner, Mohamed Ibrahim. Compressed Sensing

for UWB medical radar applications. In *2012 IEEE International Conference on Ultra-Wideband (ICUWB)*, pp. 106–110, 2012.

## Publications by Prof. Minkers's Group

### Books and Book Chapters

- [1] Amparo Albalade, Wolfgang Minker. *Semi-Supervised and Unsupervised Machine Learning*. ISTE/Wiley, London (United Kingdom), 2011.
- [2] Matthias Bezold, Wolfgang Minker. *Adaptive Multimodal Interactive Systems*. Springer, Boston (USA), 2011.
- [3] Dirk Bühler, Wolfgang Minker. *Domain-Level Reasoning for Spoken Dialogue Systems*. Springer, Boston (USA), 2011.
- [4] Mohamed Elmahdy, Rainer Gruhn, Wolfgang Minker. *Novel Techniques for Dialectal Arabic Speech Recognition*. Springer, Boston (USA), 2012. To appear.
- [5] Rainer Gruhn, Wolfgang Minker, Satoshi Nakamura. *Statistical Pronunciation Modeling for Non-Native Speech Processing*. Springer Verlag, Heidelberg (Germany), 2011.
- [6] Tobias Heinroth, Wolfgang Minker, editors. *Next Generation Intelligent Environments: Ambient Adaptive Systems*. Springer, Boston (USA), 2011.
- [7] Tobias Heinroth, Wolfgang Minker. *Introducing Spoken Dialogue Systems into Intelligent Environments*. Springer, Boston (USA), 2013.
- [8] Tobias Herbig, Franz Gerl, Wolfgang Minker. *Self-Learning Speaker Identification - A System for Enhanced Speech Recognition*. Springer Verlag, Heidelberg (Germany), 2011.
- [9] Hansjörg Hofmann, Andreas Eberhardt, Ute Ehrlich. Accessing Web Resources in Different Languages Using a Multilingual Speech Dialog System. In Ramón López-Cózar Delgado, Tetsunori Kobayashi, editors, *Proceedings of the International Workshop on Spoken Dialogue Systems*, pp. 9–15. Springer New York, 2011. 10.1007/978-1-4614-1335-6\_3.
- [10] Wolfgang Minker, Gary Geunbae Lee, Joseph Mariani, Satoshi Nakamura, editors. *Spoken Dialogue Systems Technology and Design*. Springer, Boston (USA), 2011.
- [11] Gaëtan Pruvost, Tobias Heinroth, Yacine Bellik, Wolfgang Minker. *User Interaction Adaptation within Ambient Environments*, chapter 5, pp. 153–194. Springer, Boston (USA), next generation intelligent environments: ambient adaptive systems edition, 2011.

- [12] Alexander Schmitt, Wolfgang Minker. *Towards Adaptive Spoken Dialog Systems*. Springer, Boston (USA), 2013.
- [13] Daniel Vásquez, Rainer Gruhn, Wolfgang Minker. *Hierarchical Neural Network Structures for Modeling Inter and Intra Phonetic Information for Phoneme Recognition*. Springer Verlag, Heidelberg (Germany), 2013.

### Journal and Conference Papers

- [1] Amparo Albalade, Wolfgang Minker, David Suendermann. On Cluster Validation for Detecting the number of Clusters in a Dataset. *International Journal on Artificial Intelligent Tools (IJAIT)*, Vol. 20, No. 5, pp. 13, 2011.
- [2] Gregor Bertrand, Florian Nothdurft, Wolfgang Minker. What Do You Want to Do Next? Providing the User with More Freedom in Adaptive Spoken Dialogue Systems. In *Intelligent Environments (IE), 2012 8th International Conference on*, pp. 290–296, June 2012.
- [3] Mohamed Elmahdy, Mark Hasegawa-Johnson, Eiman Mustafawi, Rehab Duwairi, Wolfgang Minker. Challenges and Techniques for Dialectal Arabic Speech Recognition and Machine Translation. In *Qatar Foundation Annual Research Forum*, Nov. 2011.
- [4] Fernando Fernández-Martínez, Kseniya Zablotskaya, Wolfgang Minker. Text Categorization Methods for Automatic Estimation of Verbal Intelligence. *Expert Systems with Applications*, Vol. 39, No. 10, pp. 9807–9820, 2012.
- [5] C. R. Garcia, O. K. Tonguz. Increasing safety and efficiency of railway. In *IEEE ICC 2012 Workshop on Intelligent Vehicular Networking: V2V/V2I Communications and Applications*, June 2012.
- [6] Hani Hagra, Christian Wagner, Achilles Kameas, Christos Goumopoulos, Apostolos Meliones, Lambrini Seremeti, Yacine Bellik, Gaëtan Pruvost, Tobias Heinroth, Wolfgang Minker. Symbiotic Ecologies in Next Generation Ambient Intelligent Environments. *International Journal of Next-Generation Computing*, Vol. 3, No. 1, 2012.
- [7] Tobias Heinroth, Dan Denich. Spoken Interaction within the Computed World: Evaluation of a Multitasking Adaptive Spoken Dialogue System. In *35th Annual IEEE International Computer Software and Applications Conference (COMPSAC 2011)*. IEEE, 2011.
- [8] Tobias Heinroth, Dan Denich, Wolfgang Minker. A Multitasking Approach to Adaptive Spoken Dialogue Management. In *Proceedings of the HCI International 2011*, 2011.
- [9] Tobias Heinroth, Maximilian Grotz, Florian Nothdurft, Wolfgang Minker. Adaptive Speech Recognition for Intuitive Model-based Spoken Dialogues. In *Proceed-*

- ings of the Eighth Conference on International Language Resources and Evaluation (LREC'12). European Language Resources Association (ELRA), 2012.
- [10] Tobias Heinroth, Achilles Kameas, Gaëtan Pruvost, Lambrini Seremeti, Yacine Bellik, Wolfgang Minker. Human-Computer Interaction in Next Generation Ambient Intelligent Environments. *Intelligent Decision Technologies - Special Issue on Knowledge-based environments and services in HCI*, Vol. 5, No. 1, pp. 31–46, 2011.
- [11] Tobias Herbig, Franz Gerl, Wolfgang Minker. Self-Learning Speaker Identification for Enhanced Speech Recognition. *Computer Speech and Language*, Vol. 26, No. 3, pp. 210–227, 2012.
- [12] Hansjörg Hofmann, Andreas Eberhardt, Ute Ehrlich. Information Extraction from the World Wide Web Using a Speech Interface. In *3rd International Conference on Automotive User Interfaces and Interactive Vehicular Applications, Adjunct Proceedings*, 2011.
- [13] Hansjörg Hofmann, Ute Ehrlich, Klaus Bader, Ilona Nothelfer, A. Berton. A Natural In-Car Speech Interface to Internet Services Using Hybrid ASR. In *Proceedings of Interspeech*, 2012.
- [14] Hansjörg Hofmann, Ute Ehrlich, A. Berton, Angela Mahr, Rafael Math, Christian Müller. Evaluation of Speech Dialog Strategies for Internet Applications in the Car. In *Proceedings of 14th Annual SIGdial Meeting on Discourse and Dialogue*, Aug. 2013.
- [15] Hansjörg Hofmann, Ute Ehrlich, A. Berton, Wolfgang Minker. Speech Interaction with the Internet - A User Study. In *Intelligent Environments*, June 2012.
- [16] Hansjörg Hofmann, Ute Ehrlich, A. Berton, Wolfgang Minker. Speech Interaction with the Internet - A User Study. In *Intelligent Environments*, June 2012.
- [17] Hansjörg Hofmann, Ute Ehrlich, Sven Reichel, A. Berton. Development of a Conversational Speech Interface Using Linguistic Grammars. In *5th International Conference on Automotive User Interfaces and Interactive Vehicular Applications, Adjunct Proceedings*, 2013.
- [18] Hansjörg Hofmann, Sakriani Sakti, Chiori Hori, Hideki Kashioka, Satoshi Nakamura, Wolfgang Minker. Sequence-based Pronunciation Variation Modeling for Spontaneous ASR Using a Noisy Channel Approach. *The Journal of The Institute of Electronics, Information and Communication Engineers*, Vol. E95-D, No. 8, 2012.
- [19] Hansjörg Hofmann, Anna Silberstein, Ute Ehrlich, A. Berton, Angela Mahr. Development of Speech-based In-car HMI Concepts for Information Exchange Internet Apps. In *Proceedings of International Workshop on Spoken Dialogue Systems*. Springer New York, Nov. 2012.
- [20] Hansjörg Hofmann, Anna Silberstein, Ute Ehrlich, A. Berton, Anja Naumann, Sebastian Möller. Entwicklung von Dialogstrategien zur Sprachbedienung von Web Transactions im Fahrzeug. In *Elektronische Sprachsignalverarbeitung*, Aug. 2012.
- [21] Frank Honold, Felix Schüssel, Florian Nothdurft, P. Kurzok. Companion technology for multimodal interaction. In *Proceedings of the 14th ACM international conference on Multimodal interaction*. ACM, 2012.
- [22] Frank Honold, Felix Schüssel, Michael Weber, Florian Nothdurft, Gregor Bertrand, Wolfgang Minker. Ein Goal-basierter Ansatz für adaptive multimodale Systeme. In *Mensch und Computer*, 2011.
- [23] Frank Honold, Felix Schüssel, Michael Weber, Florian Nothdurft, Gregor Bertrand, Wolfgang Minker. Context Models for Adaptive Dialogs and Multimodal Interaction. In *Intelligent Environments*, July 2013.
- [24] Helmut Lang, Melina Klepsch, Florian Nothdurft, Tina Seufert, Wolfgang Minker. Are computers still social actors? In *CHI '13 Extended Abstracts on Human Factors in Computing Systems*, CHI EA '13, pp. 859–864, New York, NY, USA, 2013. ACM.
- [25] Helmut Lang, Wolfgang Minker. A collaborative web-based help-system. In *Proceedings of the 2nd International Conference on Web Intelligence, Mining and Semantics*, WIMS '12, pp. 60:1–60:5, New York, NY, USA, 2012. ACM.
- [26] Helmut Lang, Christian Mosch, Bastian Boegel, David Benoit, Wolfgang Minker. An Avatar-Based Help System for Web-Portals. In *14th International Conference on Human-Computer Interaction*, pp. 537–546, 2011.
- [27] Helmut Lang, Florian Nothdurft. An avatar-based help system for a grid computing web portal. In *Proceedings of the 14th ACM international conference on Multimodal interaction*. ACM, 2012.
- [28] Andreas Lehner, C. R. Garcia, Thomas Strang, Oliver Heirich. Measurement and Analysis of the Direct Train to Train Propagation Channel in the 70 cm UHF-Band. In Thomas Strang, Andreas Festag, Alexey Vinel, Rashid Mehmood, C. R. Garcia, Matthias Röckl, editors, *Communication Technologies for Vehicles*, Vol. 6596 of *Lecture Notes in Computer Science*, pp. 45–57. Springer Berlin Heidelberg, 2011.
- [29] Andreas Lehner, Thomas Strang, C. R. Garcia. A multi-broadcast communication system for high dynamic vehicular ad-hoc networks. *International Journal of Vehicle Information and Communication Systems (IJVICS)*, Vol. 2, No. 3/4, pp. 286–302, 2011.
- [30] Florian Nothdurft, Gregor Bertrand, Helmut Lang, Wolfgang Minker. Adaptive Explanation Architecture for Maintaining Human-Computer Trust. In *36th Annual*

- IEEE Computer Software and Applications Conference, COMPSAC*, June 2012.
- [31] Florian Nothdurft, Tobias Heinroth, Wolfgang Minker. The Impact of Explanation Dialogues on Human-Computer Trust. In *Human-Computer Interaction. Users and Contexts of Use*, pp. 59–67. Springer, 2013.
- [32] Florian Nothdurft, Frank Honold, P. Kurzok. Using explanations for runtime dialogue adaptation. In *Proceedings of the 14th ACM international conference on Multimodal interaction*. ACM, 2012.
- [33] Florian Nothdurft, Helmut Lang, Melina Klepsch, Wolfgang Minker. Bases of human-computer trust and explanations. In *CHI '13 Extended Abstracts on Human Factors in Computing Systems*, CHI EA '13, pp. 1737–1742, New York, NY, USA, 2013. ACM.
- [34] Florian Nothdurft, Wolfgang Minker. Explanation Architecture for Companion Systems. In *2011 IEEE Jordan Conference on Applied Electrical Engineering and Computing Technologies (AECT 2011)*, Amman, Jordan, Dec. 2011.
- [35] Florian Nothdurft, Wolfgang Minker. Using Multimodal Resources for Explanation Approaches in Technical Systems. In *Proceedings of the Eighth Conference on International Language Resources and Evaluation (LREC'12)*. European Language Resources Association (ELRA), 2012.
- [36] Alexander Schmitt, Stefan Ultes, Wolfgang Minker. A Parameterized and Annotated Corpus of the CMU Let's Go Bus Information System. In *International Conference on Language Resources and Evaluation (LREC)*, May 2012.
- [37] Roman Sergienko, Eugene Semkin. Multistep Fuzzy Classifier Forming with Cooperative-Competitive Coevolutionary Algorithm. In *Advances in Swarm Intelligence. Third International Conference, ICSI 2012, Shenzhen, China, June 17-20, 2012 Proceedings, Part I*, Vol. 7331 of *Lecture Notes in Computer Science*. Springer Berlin Heidelberg, 2012.
- [38] Maxim Sidorov, Sergey Zablotskiy, Eugene Semkin, Wolfgang Minker. Evolutionary Design of Neural Networks for Forecasting of Financial Time Series. *Bulletin of Siberian State Aerospace University named after academician M.F. Reshetnev*. In Press, Vol. , 2012.
- [39] Stefan Ultes, Robert ElChabb, Wolfgang Minker. Application and Evaluation of a Conditioned Hidden Markov Model for Estimating Interaction Quality of Spoken Dialogue Systems. In Joseph Mariani, Laurence Devillers, Martine Garnier-Rizet, Sophie Rosset, editors, *Proceedings of the 4th International Workshop On Spoken Dialogue Systems (IWSDS)*, pp. 141–150. Springer, Nov. 2012.
- [40] Stefan Ultes, Robert ElChabb, Alexander Schmitt, Wolfgang Minker. JACHMM: A JAVA-BASED CONDITIONED HIDDEN MARKOV MODEL LIBRARY. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2013. IEEE, May 2013.
- [41] Stefan Ultes, Wolfgang Minker. HIS-OwlSpeak: A Model-driven Dialogue Manager With Multiple Control Modes. In *Intelligent Environments (IE), 2013 9th International Conference on*, pp. 108–115. IEEE, July 2013.
- [42] Stefan Ultes, Wolfgang Minker. Improving Interaction Quality Recognition Using Error Correction. In *Proceedings of the 14th Annual Meeting of the Special Interest Group on Discourse and Dialogue*. Association for Computational Linguistics, Aug. 2013.
- [43] Stefan Ultes, Alexander Schmitt, Robert ElChabb, Wolfgang Minker. Statistical Modeling of Interaction Quality in Spoken Dialogue Systems: A Comparison of (Conditioned) Hidden-Markov-Model-based Classifiers vs. Support Vector Machines. *Bulletin of Siberian State Aerospace University named after academician M.F. Reshetnev*, Vol. , 2012.
- [44] Stefan Ultes, Alexander Schmitt, Wolfgang Minker. Towards Quality-Adaptive Spoken Dialogue Management. In *NAACL-HLT Workshop on Future directions and needs in the Spoken Dialog Community: Tools and Data (SDCTD 2012)*, pp. 49–52, Montreal, Canada, June 2012. Association for Computational Linguistics.
- [45] Stefan Ultes, Alexander Schmitt, Wolfgang Minker. On Quality Ratings for Spoken Dialogue Systems – Experts vs. Users. In *Proceedings of the 2013 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies*, pp. 569–578. Association for Computational Linguistics, June 2013.
- [46] Kseniya Zablotskaya, Mohsin Abbas, Sergey Zablotskiy, Steffen Walter, Wolfgang Minker. Measuring Verbal Intelligence using Linguistic Analysis. In *The 7th International Conference on Intelligent Environments*, 2011.
- [47] Kseniya Zablotskaya, Fernando Fernández-Martínez, Wolfgang Minker. Estimating Adaptation of Dialogue Partners with Different Verbal Intelligence. In *13th annual SIGdial Meeting on Discourse and Dialogue*, 2012.
- [48] Kseniya Zablotskaya, Fernando Fernández-Martínez, Wolfgang Minker. Investigating Verbal Intelligence using the TF-IDF Approach. In *International Conference on Language Resources and Evaluation (LREC 2012)*, 2012.
- [49] Kseniya Zablotskaya, Umair Rahim, Fernando Fernández-Martínez, Wolfgang Minker. Relating Dominance of Dialogue Participants with their Verbal Intelligence Scores. In *International Conference on Language Resources and Evaluation (LREC 2012)*, 2012.
- [50] Kseniya Zablotskaya, Umair Rahim, Sergey Zablotskiy, Steffen Walter, Wolfgang Minker. Conversation Peculiarities of People with Different Verbal Intelligence. In *IWSDS 2011: Workshop on Paralinguistic Information and its Integration in*

*Spoken Dialogue Systems*, 2011.

- [51] Kseniya Zablotskaya, Sergey Zablotskiy, Fernando Fernández-Martínez, Wolfgang Minker. Language Style Matching and Verbal Intelligence. *Bulletin of Siberian State Aerospace University named after academician M.F. Reshetnev*. In Press, Vol. , 2012.
- [52] Kseniya Zablotskaya, Sergey Zablotskiy, Steffen Walter, Wolfgang Minker. A Simple One-Way Analysis of Variance as a Way to Determine More Informative Features for Speech-Based User's Verbal Intelligence Estimation. In *XIV International Conference Speech and Computer (SPECOM 2011)*, 2011.
- [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.
- [55] Sergey Zablotskiy, Alexander Shvets, Eugene Semenko, Wolfgang Minker. Recognized Russian Syllables Concatenation by means of Co-Evolutionary Asymptotic Algorithm. In *XIV International Conference Speech and Computer (SPECOM 2011)*, 2011.
- [56] Sergey Zablotskiy, Alexander Shvets, Maxim Sidorov, Eugene Semenko, Wolfgang Minker. Speech and Language Resources for LVCSR of Russian. In *International Conference on Language Resources and Evaluation (LREC)*, May 2012.
- [57] Sergey Zablotskiy, Kseniya Zablotskaya, Wolfgang Minker. Automatic Pre-processing of the Russian Text Corpora for Language Modeling. In *XIV International Conference Speech and Computer (SPECOM 2011)*, 2011.

## 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 Wackerle. *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 Grieser (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/Erase 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 Verkehrsmanagementsystem 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] Jinchen 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 Lücke. *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 “Bioinformatics 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*