

Program

AMEC

Automotive meets Electronics & Control

15th GMM GMA Symposium

AmEC 2024

Automotive meets Electronics & Control

March 14 – 15, 2024
Dortmund, Westfalenhalle

www.ame-konferenz.de



VDE VDI⁷ GMM

Preface

AmEC 2024 – Automotive meets Electronics & Control

Last year we decided to merge the two conferences Automotive meets Electronics and AUTOREG. Both conferences share many topics but there were also different foci. This joint conference covers a wider field.

The first core field to mention is on applications of artificial intelligence/machine learning (AI/ML) to many different domains. Obviously, the existing algorithms are not sufficient to solve the problem of dynamically changing environments, whereas AI/ML with their inherent flexibility are much more promising. The second core field is trajectory planning, where of course a strong interaction exists with AI/ML. Additional topics cover reliability, fuel cells, sensor technology and new computer architectures which become important for automotive.

The AmEC is a conference featuring scientific papers as well as industrial keynotes, providing an excellent mixture of both worlds and thus the unique opportunity to an effective cross fertilization.

Automotive meets Electronics & Control and we are looking forward to meeting you in Dortmund!

Your Conference Chairs

Prof. Dr. Marin Keller, Fachhochschule Südwestfalen

Prof. Dr. Georg Schildbach, Universität zu Lübeck

*Prof. Dr. Michael Wahl, Universität Siegen,
Digital University Kerala*

Table of content

Conference Organization	4
Information	4
Conference Management	5
Program Committee	5
Invited Talks.....	6
Conference Program	
Thursday, March 14 th ,2024	8
Friday, March15 th , 2024.....	12
General Information.....	16
Conference Organization	16
Registration	16
Conference Fees.....	17
Payment Information	17
Cancellation	17
Contact Information	17
Venue and Directions.....	18
Social Event	19
Sponsors	4. Cover page

Conference Organization

VDE/VDI Gesellschaft Mikroelektronik, Mikrosystem- und
Feinwerktechnik GMM
Merianstraße 28
63069 Offenbach am Main
Phone: +49 (0)69-6308-227
Fax: +49 (0)69-6308-9828
E-Mail: gmm@vde.com
www.ame-konferenz.de

Scientific conference management

G. Schildbach, Universität zu Lübeck
M. Keller, Fachhochschule Südwestfalen
M. Wahl, Universität Siegen & DUK, Kerala

Organizational conference management

Ronald Schnabel, VDE/VDI GMM, Offenbach am Main

Program Committee

D. Abel, RWTH Aachen University
B. Alt, Robert Bosch GmbH, Renningen
A. Becciu, Nuraxys GmbH, Overath
K. Belhoula, Continental Automotive Technologies GmbH,
Wetzlar
N. Beringer, CARIAD SE, Nürnberg
T. Bertram, Technische Universität Dortmund
R. Denkelmann, Aptiv Services Deutschland GmbH, Wiehl
P. Farber, Robert Bosch GmbH, Reutlingen
M. Fohlmeister, Cognizant Mobility GmbH
S. Frei, Technische Universität Dortmund
E. Kamau, Technische Hochschule Köln
M. Keller, Fachhochschule Südwestfalen, Hagen
L. Kiltz, ZF Friedrichshafen AG, Friedrichshafen
T. Liebetrau, Infineon AG, Nürnberg
R. Montino, Elmos AG, Dortmund
R. Obermaisser, Universität Siegen
H. Pu, XCMG European Research Center GmbH
C. Ress, Consultant, Aachen
S. Sattler, Friedrich-Alexander-Universität, Erlangen-
Nürnberg
A. Schäfer, KYOCERA AVX Components GmbH, Werne
G. Schildbach, Universität zu Lübeck
R. Schnabel, VDE/VDI GMM, Offenbach am Main
D. Schramm, Universität Duisburg-Essen, Duisburg
A. Stockem Novo, Hochschule Ruhr-West, Mülheim
N. Wagner, Adam Opel AG, Rüsselsheim
M. Wahl, Universität Siegen & DUK, Kerala
R. Wille, Consultant, Bönen
A. Zlocki, fka GmbH, Aachen

Invited Talks

AUTotech.agil – Expansion of the UNICARagil-Architecture for L4-Automated Driving towards Future Mobility Concepts

Lutz Eckstein

RWTH Aachen University

Opportunities with Vehicle-to-X Communication

Ignacio Llatser Marti, Frank Hoffmann

Robert Bosch GmbH

Towards the Software-Defined Vehicle

Falco Bapp

Vector Informatik, Stuttgart

Fuel Cells for Heavy Trucks

Roland Dold, Ottmar Gehring

Daimler Truck AG, Leinfelden-Echterdingen

DynaCell – Dynamic Operation and Model-based Control of Fuel Cells in mobile and stationary Applications

Heike Vallery

RWTH Aachen University

Harry Hoster

Universität of Duisburg-Essen

08:00 Registration

09:00 Opening

M. Keller, Fachhochschule Südwestfalen, Hagen

G. Schildbach, Universität zu Lübeck

R. Schnabel, VDE/VDI/GMM, Frankfurt am Main

M. Wahl, Universität Siegen & DUK, Kerala

Session 1 – Automotive Architectures & Machine Learning

Session Chair: Georg Schildbach

09:15 **Invited talk**

AUTotech.agil – Expansion of the UNICARagil-Architecture for L4-Automated Driving towards Future Mobility Concepts

Lutz Eckstein, RWTH Aachen University

10:00 **Physics Informed Deep Learning for Motion Prediction in Autonomous Driving**

Patrik Tischmann, Anne Stockem Novo,

University of Applied Sciences Ruhr West

10:25 **Confidence Tuned Localization through Learn-ing in the Loop**

Stefan Schütte¹, Markus Kuhn²,

Torsten Bertram¹

¹ TU Dortmund

² ZF Automotive Germany GmbH

10:50 **Coffee & Discussion**

Session 2 – Advanced Control Strategies & Trajectory Planning

Session Chair: André Schäfer

11:20 Application of Basis-Splines for Trajectory Planning in Highway Scenarios

*Philipp Dorpmüller¹, Thomas Schmitz²,
Naveen Bejagam², Torsten Bertram¹*

¹ TU Dortmund

² ZF Automotive Germany GmbH

11:45 On the Design of Interaction-Aware SCMPC for Complex Lane Change Maneuvers

*Robin Kensbock, Georg Schildbach,
University of Lübeck*

12:10 Lunch Break**Session 3 – Cooperative Driving**

Session Chair: Lothar Kiltz

**13:10 Invited Talk
Opportunities with Vehicle-to-X
Communication**

*Ignacio Llatser Marti, Frank Hoffmann, Robert
Bosch GmbH*

**13:55 Invited Talk
Towards the Software-Defined Vehicle**
Falco Bapp, Vector Informatik GmbH, Stuttgart

Session 4 – Poster Session & Coffee Break

Session Chair: Martin Keller

14:40 Postersession

- 1 Coaction between Automobiles and Mobile Robots - Interoperability for Affordable Last Mile Delivery Solutions**
Mayank Yogesh Khandelwal, Swaraj Tendulkar, G. Alexander Kolbai, Frank Schrödel, Hochschule Schmalkalden
- 2 AI-Based Localization and Classification of Visual Anomalies on Semiconductor Devices**
Minh Khai Le, Jason Zi Jie Chia, Dennis Peskes, Elmos Semiconductor SE, Dortmund
- 3 Machine Learning for Improving the Trustworthiness of Sensors**
George Thekkumthala, Peter William, Ghazanfer Hussain, Michael Wahl, University of Siegen
- 4 Vision-based Autonomous Trajectory Drifting using Deep Reinforcement Learning**
Fabian Domberg, Ben Barkow, Georg Schildbach, University of Lübeck

Session 5 – Infrastructure and Safety

Session Chair: Bendikt Alt

16:00 Challenges of Infrastructure for Autonomous Buses in Cities: A Review

Alessandro Becciu¹, Prof. Dr. Edwin Kamau¹

¹ Nuraxys GmbH

² University of Applied Sciences Cologne

16:25 Automated failure and tolerance analysis as a combined consideration for the proof of safety of electronic systems

Roman Müller-Hainbach, Levent Ergün, Stefan Butzmann, University of Wuppertal

17:30 Departure to Social Event

Details see page 19

08:00 Registration**Session 6 – Machine Learning and AI in the automotive context**

Session Chair: Alessandro Becciu

08:30 Personalization in Automotive Control Systems

Benedikt Alt, Gergo Ferenc Igneczi, Tuelin Baysal, Michael Hilsch, Robert Bosch GmbH, Renningen

08:55 CSAM Anomaly Detection with AI

Jason Zi Jie, Roland Krumm, Elmos Semiconductor SE, Dortmund

09:20 Investigation of the real-time feasibility of NMPC for air-path control in automotive fuel cell systems

Thuc Anh Nguyen, Verena Neisen, Dirk Abel, RWTH Aachen University, Aachen

09:45 Time-Triggered Organic Computing Architecture for Autonomous Driving Vehicles Using List Scheduling

Mario Qosja, Simon Meckel, Roman Obermaisser, University of Siegen

10:10 Coffee & Discussion**Session 7 – Future of Transportation**

Session Chair: Edwin Kamau

10:40 Invited Talk**Fuel Cells for Heavy Trucks**

Roland Dold, Ottmar Gehring, Daimler Truck AG, Leinfelden Echterdingen

11:25 Invited Talk**DynaCell – Dynamic Operation and Model-based Control of Fuel Cells in mobile and stationary Applications**

Heike Vallery¹, Harry Hoster²
¹ *Institute Automatic Control, RWTH Aachen University*
² *ZBT – The Hydrogen and Fuel Cell Center/ Universität of Duisburg-Essen*

12:10 Robust Navigation of Autonomous Transport Units in the Extractive Industry

David Benz, Dirk Abel, Heike Vallery, RWTH Aachen University

12:35 Lunch Break**13:30 Panel Session****Machine Learning for Autonomous Driving**

Hongjun Pu, XCMG European Research Center GmbH; Benedikt Alt, Robert Bosch GmbH; Christian Nunn, Aptiv Services Deutschland GmbH; Ronald Schnabel, VDE/VDI GMM, (Moderator)

Session 8 – Innovations I Electronics

Session Chair: Ralf Montino

14:15 Self-Locked Asynchronous Controller for RISC-V Architecture on FPGA

*Florian Deeg, Vittorio Serra, Sebastian Sattler,
Friedrich-Alexander-Universität Erlangen-
Nürnberg*

14:40 Integration of a 77GHz Automotive Radar System Into Plastic Surfaces Using MID-Technology

*Thomas Mager¹, Pascal Keuper², Jabil Diri¹,
Stephan Kruse³, Christoph Scheytt²*

*¹ Fraunhofer Research Institute for Mechatronic
Systems Design IEM*

² Heinz Nixdorf Institute, Paderborn

³ Paderborn University

15:05 Best Contribution Closing

*M. Keller, Fachhochschule Südwestfalen,
Hagen; G. Schildbach, Universität zu Lübeck;
R. Schnabel, VDE/VDI GMM, Offenbach am
Main; Wahl, Universität Siegen & DUK, Kerala*

General Information

Conference Organization / Registration

If you have any questions about registration, please contact:

VDE Conference Service
Ms. Judith Sanders
Merianstraße 28
63069 Offenbach am Main
Phone: +49 (0)69-6308-229
Fax: +49 (0)69-6308-144
E-Mail: judith.sanders@vde.com
URL: www.vde.com

Registration

Please register for the Automotive meets Electronics and Control Conference via the VDE Conference Service. As to the registration link, please visit the event homepage www.ame-konferenz.de

You will receive your conference badge at the conference office on site before the start of the event.

Registration fees

	Registration until 16.02.2024	Registration after 16.02.2024
Non VDE-Member	640,00 €	750,00 €
Personal VDE Member*	610,00 €	720,00 €
University	450,00 €	530,00 €
Presenter/Program Committee/ Session Chair	410,00 €	410,00 €
Students* (without proceedings)	110,00 €	190,00 €

* Discount only if you send a copy of your VDE/VDI membership card or student ID!

The conference fee includes the proceedings.

Payment of Registration Fees

Please do not transfer the registration fee to the specified account until you have received confirmation of your registration. The name of the participant and the invoice number must be indicated on the bank transfer.

If you register at short notice, please pay the registration fee in cash at the conference office at the venue. Participants who register on site must be aware that no conference batch can be issued.

Please note: A definite reservation for the conference will only be made after receipt of your payment.

Cancellation

If you cancel by 16.02.2024, the participation fee will be refunded minus € 90.00 for processing costs; if you cancel after this date, the participation fee cannot be refunded. However, it is possible to nominate a substitute participant.

Phone contact person during the conference

The conference office can be reached via

Phone: 0171 / 4695 118 (Ronald Schnabel)

Venue

KHC Westfalenhallen
Strobelallee 45, 44139 Dortmund
Contact: Frau Sabrina Leue
Phone: +49 (0)231 1204-1151
E-Mail: sabrina.leue@kongress-dortmund.de

Directions to Dortmund

Via Train

Please book your journey to Dortmund main station. At the central station you change to the subway line U 45 direction Westfalenhallen.

Public transportation

The subway line 45 (direction Westfalenhallen) takes you comfortably from Dortmund main station to the „Westfalenhallen“ stop in 10 minutes.

From Dortmund City Center (U-Bahn stations Reinoldikirche or Stadtgarten), the U 46 (direction Westfalenhallen) will also take you to the „Westfalenhallen“ stop in about 5 minutes.

Alternatively, take the U 42 line (direction Hombruch) to the „Theodor-FlieBner-Heim“ stop. From here it is only a few minutes' walk to the conference site.

For information call: 01803 50 40 30

By car

Direct connection to the highways via the B 1 (A 40):

- A 1 Hansalinie
- A 45 Sauerlandlinie
- A 2 Berlin - Hannover - Dortmund - Oberhausen
- A 42 Duisburg - Dortmund
- A 44 Dortmund - Kassel

If you are traveling on the B1/A 40, take the exit to the B54 towards Hagen (not City Center). Turn right again immediately and cross the traffic circle to parking lot P5 which is reserved exclusively for AmEC participants.

If you are approaching via the B54, follow the signs to ‚Stadtkrone‘. The exit also leads you to parking lot P5 via the traffic circle.

If you use a GPS, please enter "Strobelallee" or the special destination „Westfalenhallen“ as destination address.

Directions



Social Event, Thursday, March 14th, 2024

Planetarium Bochum

18:30 Destination: FUTURE – From now to eternity

Zeiss Planetarium Bochum
Castroper Straße 67
44791 Bochum

Dinner

20:00 – 22:30

MemorieZ
Brennaborstraße 12
44149 Dortmund
Phone +49 (0)231 9416 4999

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