

# **15th Automotive Meets Electronics and Control. GMM GMA Symposium. (AmEC 2024)**

GMM-Fachbericht 108

Dortmund, Germany  
14-15 March 2024

ISBN: 979-8-3313-0013-5

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2024) by VDE VERLAG GMBH  
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact VDE VERLAG GMBH  
at the address below.

VDE VERLAG GMBH  
Bismarckstr. 33  
P.O.B. 12 01 43  
10625 Berlin, Germany

Phone: +49 30 34 80 01 - 0  
Fax: +49 30 34 80 01 - 9088

[kundenservice@vde-verlag.de](mailto:kundenservice@vde-verlag.de)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

## Contents

### Automotive Architectures & Machine Learning

Session Chair: Georg Schildbach

- 01 Physics Informed Deep Learning for Motion Prediction in Autonomous Driving..... 7**  
P. Tischmann, R. Baumann, A. Stockem Novo, University of Applied Sciences Ruhr West,  
Mülheim a. d. Ruhr
- 02 Confidence Tuned Localization through Learning in the Loop..... 13**  
S. Schütte, T. Bertram, TU Dortmund; M. Kuhn, ZF Automotive Germany GmbH, Düsseldorf

### Advanced Control Strategies & Trajectory Planning

Session Chair: André Schäfer

- 03 Application of Basis-Splines for Trajectory Planning in Highway Scenarios..... 18**  
P. Dorpmüller, T. Bertram, TU Dortmund; T. Schmitz, N. Bejagam, ZF Automotive Germany  
GmbH, Düsseldorf
- 04 On the Design of Interaction-Aware SCMPc for Highway Merging Scenarios ..... 24**  
R. Kensbock, G. Schildbach, University of Lübeck

### Poster Session

Session Chair: Martin Keller

- 05 Coaction between Automobiles and Mobile Robots - Interoperability for Affordable Last  
Mile Delivery Solutions ..... 30**  
M. Y. Khandelwal, S. Tendulkar, G. A. Kolbai, F. Schrödel, Schmalkalden University of Applied  
Sciences, Schmalkalden
- 06 AI-Based Localization and Classification of Visual Anomalies on Semiconductor Devices..... 36**  
M. K. Le, J. Z. J. Chia, D. Peskes, Elmos Semiconductor SE, Dortmund,
- 07 Machine learning for improving the trustworthiness of sensors..... 41**  
G. Hussain, L. G. Thekkumthala, P. A. William, M. G. Wahl, University of Siegen
- 08 Vision-based Autonomous Trajectory Drifting using Deep Reinforcement Learning..... 47**  
F. Domberg, B. Barkow, G. Schildbach, University of Lübeck

### Infrastructure and Safety

Session Chair: Bendikt Alt

- 09 Challenges of Infrastructures for autonomous Buses in Cities: A review ..... 53**  
A. Becciu, Nuraxys GmbH, Overath; E. N. Kamau, University of Applied Sciences Cologne

- 10 Automated failure and tolerance analysis as a combined consideration for the proof of safety of electronic systems ..... 58**  
R. Müller-Hainbach, L. Ergün, S. Butzmann, University of Wuppertal

### **Machine Learning/Deep Learning in the automotive context**

Session Chair: Alessandro Becciu

- 11 CSAM anomaly detection with AI..... 63**  
J. C. Z. Jie, R. Krumm, Elmos Semiconductor SE, Dortmund

- 12 Investigation of the real-time feasibility of NMPC for air-path control in automotive fuel cell systems ..... 67**  
T. A. Nguyen, V. Neisen, D. Abel, RWTH Aachen University, Aachen

- 13 Time-Triggered Organic Computing Architecture for Autonomous Driving Vehicles Using List Scheduling..... 73**  
M. Qosja, S. Meckel, R. Obermaisser, University of Siegen

### **Future of Transportation**

Session Chair: Edwin Kamau

- 14 Robust Navigation of Autonomous Transport Units in the Extractive Industry ..... 79**  
D. Benz, D. Abel, RWTH Aachen University, Aachen

### **Innovations in Electronics**

- 15 Self-Locked Asynchronous Controller for RISC-V Architecture on FPGA..... 84**  
F. Deeg, S. M. Sattler, Friedrich-Alexander-University Erlangen-Nuremberg

- 16 Integration of a 77GHz automotive radar system into plastic surfaces using MID-technology .... 89**  
T. Mager, J. Diri, Fraunhofer Research Institute for Mechatronic Systems Design IEM, Paderborn;  
P. Kneuper, S. Kruse, C. Scheytt, Paderborn University, Paderborn