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**3RD WORKSHOP ON  
MACHINE LEARNING IN  
NETWORKING (MaLeNe)  
PROCEEDINGS**

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**SEPTEMBER 1,  
2025**



**CO-LOCATED WITH  
THE 6TH INTERNATIONAL CONFERENCE ON  
NETWORKED SYSTEMS (NETSYS 2025)  
ILMENAU, GERMANY**

### 3<sup>rd</sup> Workshop on Machine Learning in Networking (MaLeNe)

The Third International Workshop on Machine Learning in Networking (MaLeNe, <https://www.uni-augsburg.de/en/fakultaet/fai/informatik/prof/netcom/events/malene2025/>) was a successful half day event held at Technical University of Ilmenau on September 1, 2025, where it was co-located with the Conference on Networked Systems (NetSys 2025). It follows the history of MaLeNe KuVS workshops (Fachgespräch) and MaLeNe NetSys workshops as the 6th edition of the MaLeNe series, and was organized by workshop co-chairs Michael Seufert (University of Augsburg, Germany), Andreas Blenk (Siemens AG, Germany), and Björn Richerzhagen (Siemens AG, Germany). The workshop accepted 7 full papers for presentation.

On the day of the workshop, the co-chairs welcomed 34 registered participants. The workshop started with an industry keynote given by Philippe Buschmann (Siemens AG, Germany) who elaborated on “Recent AI Trends in Industrial Network Environments”. He explored industrial AI and its application in smart mobility, smart infrastructure, and manufacturing. He especially highlighted the challenges and opportunities of AI adoption in these settings through the perspective of Siemens.

Afterwards, the first technical session started. Katharina Dietz (University of Würzburg, Germany) evaluated the consensus of XAI -based network intrusion detection and how to improve consensus with feature selection methods. Nasim Nezhadsistani (University of Zurich, Switzerland) presented an asynchronous consensus-driven multi-agent approach to decentralized federated learning for intrusion detection in 5G networks. Zineddine Bettouche (Deggendorf Institute of Technology, Germany) discussed spatiotemporal machine learning techniques for cellular traffic forecasting with a particular focus on Mamba deep learning architectures.

After the coffee break, Christian Maier (Salzburg Research, Austria) elaborated on predicting performance metrics in edge-cloud networks using GNNs. Timothy Harrison (University of Hagen, Germany) presented work on state cloning for high order Markov chains with the GraphLearner. Yanakorn Ruamsuk (University of Hagen, Germany) talked about emotion-controlled communication in agent networks. Finally, Alexander Niedermayer (Karlsruhe University of Applied Sciences, Germany) presented an approach for client-agnostic continuous authentication via keystroke-induced traffic patterns.

The workshop co-chairs closed the day with a short recap and thanked all speakers and participants who engaged in the fruitful discussions. As the workshop has proven to foster active collaborations in the research community, another edition will be considered in the future.

We would like to thank all the authors, reviewers, and attendants for their precious contributions towards the successful organization of the workshop!

Michael Seufert, Andreas Blenk, Björn Richerzhagen  
MaLeNe 2025 Workshop Co-Chairs

# Program

## Welcome and Workshop Opening

### Keynote

*Recent AI Trends in Industrial Network Environments*, Philippe Buschmann (Siemens AG)

### Session 1: Machine Learning for Intrusion Detection and Traffic Forecasting

*1. I Choose You: Evaluating the Impact of Feature Selection on XAI Consensus for ML-NIDS*

Katharina Dietz (University of Würzburg), Johannes Schleicher (University of Augsburg), Nikolas Wehner (University of Würzburg), Mehrdad Hajizadeh (Technical University of Chemnitz), Pedro Casas (AIT Austrian Institute of Technology), Stefan Geißler (University of Würzburg), Michael Seufert (University of Augsburg) and Tobias Hossfeld (University of Würzburg)

*2. Decentralized Federated Learning for Intrusion Detection in 5G Networks: An Asynchronous Consensus driven Multi-Agent Approach*

Nasim Nezhadsistani (University of Zurich), Francisco Enguix (Polytechnic University of Valencia), Carlos Carrascosa (Polytechnic University of Valencia) and Burkhard Stiller (University of Zurich)

*3. HiSTM: Hierarchical Spatiotemporal Mamba for Cellular Traffic Forecasting*

Zineddine Bettouche, Khalid Ali, Andreas Fischer and Andreas Kassler (Deggendorf Institute of Technology)

### Session 2: Novel Machine Learning Approaches and Applications in Networking

*4. Predicting Performance Metrics in Edge-Cloud Networks using Graph Neural Networks*

Christian Maier, Nina Großegesse and Felix Strohmeier (Salzburg Research)

*5. State Cloning with the GraphLearner*

Timothy Harrison and Herwig Unger (University of Hagen)

*6. Emotion-Controlled Communication in Agent Networks*

Yanakorn Ruamsuk and Herwig Unger (University of Hagen)

*7. Client-Agnostic Continuous Authentication via Keystroke-Induced Traffic Patterns*

Alexander Niedermayer, David Monschein and Oliver Waldhorst (Karlsruhe University of Applied Sciences)

## Wrap-up and Closing Remarks