

Maximilian Kloock, M.Sc. RWTH

Member of the [Cyber-physical Mobility Group](#)

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Research

My research in the [Cyber-physical Mobility Group](#) focuses on the interdisciplinary intersection of software engineering, control engineering, optimization, and communications. Currently, I work in the project [AutoKnigge](#) and in the [Cyber-Physical Mobility Lab](#).

Theses

Within the scope of my research activities, topics for final theses arise continuously. If you are interested, please contact me by e-mail or personally in my office.

Open Student Positions

Initiative applications are welcome. Please include in your application: transcript of records (Bachelor and possibly Master), short CV, and certificates.

Publikationen

[KA23]

[PDFBIB](#)

Kloock, M. M. and Alrifaae, B., "Coordinated Cooperative Distributed Decision-Making Using Synchronization of Local Plans", *IEEE Transactions on Intelligent Vehicles*, vol. 8, iss. 2, pp. 1292-1306, 2023

Coordinated Cooperative Distributed Decision-Making Using Synchronization of Local Plans

Bibtex entry :

```
@article { KA23,  
  author = { Kloock, Maximilian Martin and Alrifaae, Bassam },  
  title = { Coordinated Cooperative Distributed Decision-Making Using  
    Synchronization of Local Plans },  
  journal = { IEEE Transactions on Intelligent Vehicles },  
  publisher = { IEEE },  
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  number = { 2 },  
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[KA23a]

[PDFBIB](#)

Kloock, M. M. and Alrifaae, B., "Cooperative Pose Control of Non-Holonomic Vehicles Using Synchronization", in *Proc. 2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC) : [Proceedings]*, 2023, IEEE.

Cooperative Pose Control of Non-Holonomic Vehicles Using Synchronization

Bibtex entry :

```
@inproceedings { KA23a,  
  author = { Kloock, Maximilian Martin and Alrifaae, Bassam },  
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    doi = { 10.1109/ITSC57777.2023.10422078 },
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    und Absicherung von Verhalten f{"u}r Kooperativ
Interagierende Automobile (273237627) },
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```

[Klo23]

[PDFBIB](#)

Kloock, M. M., "Synchronization-based cooperative trajectory planning of networked vehicles", PhD Thesis, Aachen, 2023.

Synchronization-based cooperative trajectory planning of networked vehicles

Bibtex entry :

```

@phdthesis { Klo23,
    author = { Kloock, Maximilian Martin },
    othercontributors = { Kowalewski, Stefan and Althoff, Matthias },
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networked vehicles },
    publisher = { RWTH Aachen University },
    school = { RWTH Aachen University },
    pages = { 1 Online-Ressource : Illustrationen, Diagramme },
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[KSA23]

[PDFBIB](#)

Kloock, M. M., Scheffe, P., and Alrifaae, B., "Testing distributed trajectory planning in the cyber-physical mobility lab", *Automatisierungstechnik*, vol. 71, iss. 4, pp. 317-325, 2023

Testing distributed trajectory planning in the cyber-physical mobility lab

Bibtex entry :

```
@article { KSA23,  
  author = { Kloock, Maximilian Martin and Scheffe, Patrick and  
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[KSG+23]

[PDFBIB](#)

Kloock, M. M., Scheffe, P., Gress, O., and Alrifaae, B., "An Architecture for Experiments in Connected and Automated Vehicles", *IEEE open journal of intelligent transportation systems*, vol. 4, pp. 175-186, 2023

An Architecture for Experiments in Connected and Automated Vehicles

Bibtex entry :

```
@article { KSG+23,  
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[SHK+23]

[PDFBIB](#)

Scheffe, P., Henneken, T. M., Kloock, M. M., and Alrifaae, B., "Sequential Convex Programming Methods for Real-time Optimal Trajectory Planning in Autonomous Vehicle Racing", *IEEE Transactions on Intelligent Vehicles : T-IV*, vol. 8, iss. 1, pp. 661-672, 2023

Sequential Convex Programming Methods for Real-time Optimal Trajectory Planning in Autonomous Vehicle Racing

Bibtex entry :

```

@article { SHK+23,
    author = { Scheffe, Patrick and Henneken, Theodor Mario and Kloock,
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    title = { Sequential Convex Programming Methods for Real-time
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    journal = { IEEE Transactions on Intelligent Vehicles : T-IV },
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```

[KDK+22]

[PDFBIB](#)

Kloock, M. M., Dirksen, M., Kowalewski, S., and Alrifaae, B., "Generation of Coupling Topologies for Multi-Agent Systems using Non-Cooperative Games", in *Proc. 2022 IEEE Intelligent Vehicles Symposium (IV) : 4-9 June 2022 / publisher: IEEE, Piscataway, NJ, 2022, IEEE*, pp. 1-8.

Generation of Coupling Topologies for Multi-Agent Systems using Non-Cooperative Games

Bibtex entry :

```
@inproceedings { KDK+22,  
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June  
2022 / publisher: IEEE },  
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[KHK+21]

[PDFBIB](#)

Kloock, M. M., He, Q., Kowalewski, S., and Alrifaae, B., "Trajectory Verification for Networked and Autonomous Vehicles using Temporal Logic and Model Checking", in *Proc. 2021 IEEE International Intelligent Transportation Systems Conference (ITSC) : 19-22 Sept. 2021 / publisher: IEEE, [Piscataway, NJ], 2021, IEEE*, pp. 244-250.

Trajectory Verification for Networked and Autonomous Vehicles using Temporal Logic and Model Checking

Bibtex entry :

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@inproceedings { KHK+21,  
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    Stefan and Alrifaae, Bassam },
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[KSM+21]

PDFBIB

Kloock, M. M., Scheffe, P., Maczijekowski, J., Kampmann, A., Mokhtarian, A., Kowalewski, S., and Alrifaae, B., "Cyber-Physical Mobility Lab : An Open-Source Platform for Networked and Autonomous Vehicles", in *Proc. 2021 European Control Conference (ECC)*, [Piscataway, NJ], 2021, IEEE, pp. 1937-1944.

Cyber-Physical Mobility Lab : An Open-Source Platform for Networked and Autonomous Vehicles

Bibtex entry :

```

@inproceedings { KSM+21,
  author = { Kloock, Maximilian Martin and Scheffe, Patrick and
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  title = { Cyber-Physical Mobility Lab : An Open-Source Platform for
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[KST+20]

[PDFBIB](#)

Kloock, M. M., Scheffe, P., Tülleners, I., Maczjewski, J., Kowalewski, S., and Alrifaae, B., "Vision-Based Real-Time Indoor Positioning System for Multiple Vehicles", *IFAC-PapersOnLine*, vol. 53, iss. 2, pp. 15446-15453, 2020

Vision-Based Real-Time Indoor Positioning System for Multiple Vehicles

Bibtex entry :

```
@article { KST+20,  
  author = { Kloock, Maximilian Martin and Scheffe, Patrick and  
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[SMK+20]

[PDFBIB](#)

Scheffe, P., Maczjewski, J., Kloock, M. M., Kampmann, A., Derks, A., Kowalewski, S., and Alrifaae, B., "Networked and Autonomous Model-scale Vehicles for Experiments in Research and Education", *IFAC-PapersOnLine*, vol. 53, iss. 2, pp. 17332-17337, 2020

Networked and Autonomous Model-scale Vehicles for Experiments in Research and Education

Bibtex entry :

```
@article { SMK+20,
  author = { Scheffe, Patrick and Maczijekowski, Janis and Kloock,
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  title = { Networked and Autonomous Model-scale Vehicles for
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[KKM+19]

[PDFBIB](#)

Kloock, M. M., Kragl, L., Maczijekowski, J., Alrifaae, B., and Kowalewski, S., "Distributed Model Predictive Pose Control of Multiple Nonholonomic Vehicles", in *Proc. IV19 : 30th IEEE Intelligent Vehicles Symposium : 9-12 June 2019, Paris / publisher: IEEE, Piscataway, NJ, 2019, IEEE, pp. 1620-1625.*

Distributed Model Predictive Pose Control of Multiple Nonholonomic Vehicles**Bibtex entry :**

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@inproceedings { KKM+19,
  author = { Kloock, Maximilian Martin and Kragl, Ludwig and
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9-12 June
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  year = { 2019 },
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address = { Piscataway, NJ },
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[KSB+19]

[PDFBIB](#)

Kloock, M. M., Scheffe, P., Botz, L., Maczjewski, J., Alrifaae, B., and Kowalewski, S., "Networked Model Predictive Vehicle Race Control", in *Proc. The 2019 IEEE Intelligent Transportation Systems Conference - ITSC : Auckland, New Zealand, 27-30 October 2019 / IEEE, IEEE-ITSC 2019, ITSS - IEEE Intelligent Transportation Systems Society, Piscataway, NJ, 2019, IEEE*, pp. 1552-1557.

Networked Model Predictive Vehicle Race Control

Bibtex entry :

```
@inproceedings { KSB+19,
    author = { Kloock, Maximilian Martin and Scheffe, Patrick and Botz,
    Lukas and Maczjewski, Janis and Alrifaae, Bassam and
    Kowalewski, Stefan },
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    booktitle = { The 2019 IEEE Intelligent Transportation Systems
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[KSM+19]

[PDFBIB](#)

Kloock, M. M., Scheffe, P., Marquardt, S., Maczjewski, J., Alrifaae, B., and Kowalewski, S.,

"Distributed Model Predictive Intersection Control of Multiple Vehicles", in *Proc. The 2019 IEEE Intelligent Transportation Systems Conference - ITSC : Auckland, New Zealand, 27-30 October 2019 / IEEE, IEEE-ITSC 2019, ITSS - IEEE Intelligent Transportation Systems Society*, Piscataway, NJ, 2019, IEEE, p. 8917117, 1735-1740.

Distributed Model Predictive Intersection Control of Multiple Vehicles

Bibtex entry :

```
@inproceedings { KSM+19,
  author = { Kloock, Maximilian Martin and Scheffe, Patrick and
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    IEEE-ITSC 2019, ITSS - IEEE Intelligent Transportation
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[VKR+19]

[PDFBIB](#)

Völker, M., Kloock, M. M., Rabanus, L., Alrifaae, B., and Kowalewski, S., "Verification of Cooperative Vehicle Behavior using Temporal Logic", *IFAC-PapersOnLine*, vol. 52, iss. 8, pp. 99-104, 2019

Verification of Cooperative Vehicle Behavior using Temporal Logic

Bibtex entry :

```
@article { VKR+19,
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