

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*, pp. 1-15, 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 },  
  pages = { 1-15 },  
  year = { 2023 },  
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  issn = { 2379-8858 },  
  doi = { 10.1109/TIV.2023.3234189 },  
  typ = { PUB:(DE-HGF)16 },  
  reportid = { RWTH-2023-00601 },  
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  url = { http://publications.rwth-aachen.de/record/862885 },  
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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,  
    Maximilian Martin and Alrifaae, Bassam },  
  title = { Sequential Convex Programming Methods for Real-time
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Optimal

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Trajectory Planning in Autonomous Vehicle Racing },
journal = { IEEE Transactions on Intelligent Vehicles : T-IV },
publisher = { IEEE },
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volume = { 8 },
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cin = { 122810 / 120000 },
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}

```

[KDK+22]

[PDFBIB](#)

Kloock, M. M., Dirksen, M., Kowalewski, S., and Alrifaaee, 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,
  author = { Kloock, Maximilian Martin and Dirksen, Matthis and
    Kowalewski, Stefan and Alrifaaee, Bassam },
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    using Non-Cooperative Games },
  booktitle = { 2022 IEEE Intelligent Vehicles Symposium (IV) : 4-9
    June
      2022 / publisher: IEEE },
  publisher = { IEEE },
  pages = { 1-8 },
  year = { 2022 },
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  organization = { 33. IEEE Intelligent Vehicles Symposium, Aachen
    (Germany),
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  doi = { 10.1109/IV51971.2022.9827431 },
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    http://publications.rwth-aachen.de/record/852149/files/852149.pdf },
}

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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 :

```
@inproceedings { KHK+21,  
  author = { Kloock, Maximilian Martin and He, Qingyun and  
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  title = { Trajectory Verification for Networked and Autonomous  
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  booktitle = { 2021 IEEE International Intelligent Transportation  
Systems  
    Conference (ITSC) : 19-22 Sept. 2021 / publisher: IEEE },  
  publisher = { IEEE },  
  pages = { 244-250 },  
  year = { 2021 },  
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  organization = { 24. International Intelligent Transportation  
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  doi = { 10.1109/ITSC48978.2021.9564414 },  
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[KSM+21]

[PDFBIB](#)

Kloock, M. M., Scheffe, P., Maczijewski, 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,
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author = { Kloock, Maximilian Martin and Scheffe, Patrick and
           Maczijewski, Janis and Kampmann, Alexandru and Mokhtarian,
           Armin and Kowalewski, Stefan and Alrifaae, Bassam },
title = { Cyber-Physical Mobility Lab : An Open-Source Platform for
          Networked and Autonomous Vehicles },
booktitle = { 2021 European Control Conference (ECC) },
publisher = { IEEE },
pages = { 1937-1944 },
year = { 2021 },
address = { [Piscataway, NJ] },
organization = { 2021 European Control Conference, online,
2021-06-29 -
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doi = { 10.23919/ECC54610.2021.9654986 },
typ = { PUB:(DE-HGF)7 },
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[KST+20]

PDFBIB

Kloock, M. M., Scheffe, P., Tülleners, I., Maczijewski, 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
            T{"u"}lleners, Isabelle and Maczijewski, Janis and
            Kowalewski, Stefan and Alrifaae, Bassam },
  title = { Vision-Based Real-Time Indoor Positioning System for
            Multiple Vehicles },
  journal = { IFAC-PapersOnLine },
  publisher = { Elsevier },
  pages = { 15446-15453 },
  volume = { 53 },
  number = { 2 },
  year = { 2020 },
  address = { Frankfurt },
  issn = { 2405-8963 },
  organization = { 21. IFAC World Congress, online, 2020-07-11 -
2020-07-17 },
  doi = { 10.1016/j.ifacol.2020.12.2367 },
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[SMK+20]

[PDFBIB](#)

Scheffe, P., Maczijewski, J., Kloock, M. M., Kampmann, A., Derks, A., Kowalewski, S., and Alrifaaee, 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 Maczijewski, Janis and Kloock,  
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http://publications.rwth-aachen.de/record/817552/files/817552.pdf },  
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[KKM+19]

[PDFBIB](#)

Kloock, M. M., Kragl, L., Maczijewski, J., Alrifaaee, 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 :

```
@inproceedings { KKM+19,
  author = { Kloock, Maximilian Martin and Kragl, Ludwig and
    Maczijewski,
      Janis and Alrifaae, Bassam and Kowalewski, Stefan },
  title = { Distributed Model Predictive Pose Control of Multiple
    Nonholonomic Vehicles },
  booktitle = { IV19 : 30th IEEE Intelligent Vehicles Symposium :
    9-12 June
      2019, Paris / publisher: IEEE },
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  pages = { 1620-1625 },
  year = { 2019 },
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  organization = { 30. IEEE Intelligent Vehicles Symposium, Paris
    (France),
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  doi = { 10.1109/IVS.2019.8813980 },
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[KSB+19]

[PDFBIB](#)

Kloock, M. M., Scheffe, P., Botz, L., Maczijewski, 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 Maczijewski, Janis and Alrifaae, Bassam and
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  title = { Networked Model Predictive Vehicle Race Control },
  booktitle = { The 2019 IEEE Intelligent Transportation Systems
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publisher = { IEEE },
pages = { 1552-1557 },
year = { 2019 },
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Conference,
    Auckland (New Zealand), 2019-10-27 - 2019-10-30 },
doi = { 10.1109/ITSC.2019.8917222 },
typ = { PUB:(DE-HGF)7 },
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[KSM+19]

[PDFBIB](#)

Kloock, M. M., Scheffe, P., Marquardt, S., Maczijewski, 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
    Marquardt, Sascha and Maczijewski, Janis and Alrifaae,
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  title = { Distributed Model Predictive Intersection Control of
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  booktitle = { The 2019 IEEE Intelligent Transportation Systems
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  year = { 2019 },
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}

[VKR+19]

PDFBIB

Völker, M., Kloock, M. M., Rabanus, L., Alrifaaee, 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,
  author = { V{"o"}lker, Marcus and Kloock, Maximilian Martin and
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  title = { Verification of Cooperative Vehicle Behavior using
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