

# Dr.-Ing. Hilal Diab

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Büro: Raum 2321 (Gebäude H)

## Interessen

- Erreichbarkeitsanalyse hybrider Systeme
- Skalierte Fahrzeuge als Versuchsträger für autonomes Fahren

## Projekte

- \* [Sicherheitsanalyse und Regelung von Fahrzeugkolonnen](#)
- \* [Teilnahme am Carolo Cup](#)

## Veröffentlichungen

[Dia15]

[PDFBIB](#)

Diab, H., "Experimental validation and mathematical analysis of cooperative vehicles in a platoon", PhD Thesis, Aachen, 2015.

## Experimental validation and mathematical analysis of cooperative vehicles in a platoon

### Bibtex entry :

```
@phdthesis { Dia15,  
  author = { Diab, Hilal },  
  othercontributors = { Kowalewski, Stefan and Abel, Dirk },  
  title = { Experimental validation and mathematical analysis of  
    cooperative vehicles in a platoon },  
  publisher = { Fachgruppe Informatik, RWTH Aachen University },  
  school = { RWTH Aachen University },  
  pages = { X, 131 S. : Ill., graph. Darst. },  
  series = { Aachener Informatik-Berichte },  
  year = { 2015 },  
  address = { Aachen },
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typ = { PUB:(DE-HGF)29 },
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url = {
http://publications.rwth-aachen.de/record/465272/files/465272_source.zi
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[BDK13]

[PDFBIB](#)

Ben Makhlof, I., Diab, H., and Kowalewski, S., "Reachability Analysis for Managing Platoons at Intersections", in *Proc. 2013 21st Mediterranean Conference on Control & Automation (MED 2013) : [Platanias], Chania, Crete, Greece, 25 - 28 June 2013 ; [conference proceedings] / [sponsor: Mediterranean Control Association. Technical co-sponsors: IEEE Control Systems Society; IEEE Robotics & Automation Society ... Ed. by Panos Antsaklis ...]. - 1-2, Piscataway, NJ, 2013, IEEE, pp. 1141-1147.*

## Reachability Analysis for Managing Platoons at Intersections

### Bibtex entry :

```
@inproceedings { BDK13,
  author = { Ben Makhlof, Ibtissem and Diab, Hilal and Kowalewski,
    Stefan },
  title = { Reachability Analysis for Managing Platoons at
    Intersections },
  booktitle = { 2013 21st Mediterranean Conference on Control &
    Automation
      (MED 2013) : [Platanias], Chania, Crete, Greece, 25 - 28
      June 2013 ; [conference proceedings] / [sponsor:
      Mediterranean Control Association. Technical co-sponsors:
      IEEE Control Systems Society; IEEE Robotics & Automation
      Society ... Ed. by Panos Antsaklis ...]. - 1-2 },
  publisher = { IEEE },
  pages = { 1141-1147 },
  year = { 2013 },
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}
```

[HDB+13]

[PDFBIB](#)

Hänsch, P., Diab, H., Ben Makhlof, I., and Kowalewski, S., "Reachability Analysis of Linear Systems with Stepwise Constant Inputs", *Electronic notes in theoretical computer science : ENTCS*, vol. 297, pp. 61-74, 2013

# Reachability Analysis of Linear Systems with Stepwise Constant Inputs

## Bibtex entry :

```
@article { HDB+13,  
  author = { H{"a}nsch, Paul and Diab, Hilal and Ben Makhlouf,  
  Ibtissem  
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  title = { Reachability Analysis of Linear Systems with Stepwise  
  Constant Inputs },  
  journal = { Electronic notes in theoretical computer science :  
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[BDK12]

[PDFBIB](#)

Ben Makhlouf, I., Diab, H., and Kowalewski, S., "Safety Verification of a Controlled Cooperative Platoon Under Loss of Communication Using Zonotopes", in *Proc. Inproceeding of the 4th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS 12), Eindhoven, NL, 2012*, pp. 333-338.

# Safety Verification of a Controlled Cooperative Platoon Under Loss of Communication Using Zonotopes

## Bibtex entry :

```
@inproceedings { BDK12,  
  author = { Ben Makhlouf, Ibtissem and Diab, Hilal and Kowalewski,  
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  title = { Safety Verification of a Controlled Cooperative Platoon  
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  booktitle = { Inproceeding of the 4th IFAC Conference on Analysis  
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typ = { PUB:(DE-HGF)8 },
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[DBK12]

[PDFBIB](#)

Diab, H., Ben Makhoulf, I., and Kowalewski, S., "A Platoon of Vehicles Approaching an Intersection: A Testing Platform for Safe Intersections", in *Proc. 2012 15th International IEEE Conference on Intelligent Transportation Systems (ITSC) : 16 - 19 Sept. 2012, Anchorage, Alaska, USA*, Piscataway, NJ, 2012, IEEE, pp. 1918-1923.

## A Platoon of Vehicles Approaching an Intersection: A Testing Platform for Safe Intersections

### Bibtex entry :

```
@inproceedings { DBK12,
  author = { Diab, Hilal and Ben Makhoulf, Ibtissem and Kowalewski, Stefan },
  title = { A Platoon of Vehicles Approaching an Intersection: A Testing Platform for Safe Intersections },
  booktitle = { 2012 15th International IEEE Conference on Intelligent Transportation Systems (ITSC) : 16 - 19 Sept. 2012, Anchorage, Alaska, USA },
  publisher = { IEEE },
  pages = { 1918-1923 },
  year = { 2012 },
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  doi = { 10.1109/ITSC.2012.6338822 },
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}
```

[RKH+12]

[PDFBIB](#)

Reuter, S., Kowalewski, S., Hauck, E., Diab, H., and Jeschke, S., "Design and implementation of a vehicle dynamics control system by means of torque vectoring for an autonomous vehicle", in *Proc. 2012 IEEE International Conference on Robotics and Biomimetics (ROBIO 2012) : Guangzhou, China, 11 - 14 December 2012 / [sponsored by IEEE Robotics and Automation Society (RAS) ...]*, Piscataway, NJ, 2012, IEEE, pp. 1691-1696.

## Design and implementation of a vehicle dynamics

## control system by means of torque vectoring for an autonomous vehicle

### Bibtex entry :

```
@inproceedings { RKH+12,
  author = { Reuter, Sebastian and Kowalewski, Stefan and Hauck, Eckart
    and Diab, Hilal and Jeschke, Sabina },
  title = { Design and implementation of a vehicle dynamics control
    system by means of torque vectoring for an autonomous
    vehicle },
  booktitle = { 2012 IEEE International Conference on Robotics and
    Biomimetics (ROBIO 2012) : Guangzhou, China, 11 - 14
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    Society (RAS) ...] },
  publisher = { IEEE },
  pages = { 1691-1696 },
  year = { 2012 },
  address = { Piscataway, NJ },
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}
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[BMH+11]

[PDFBIB](#)

Ben Makhlof, I., Maschuw, J. P., Hänsch, P., Diab, H., Kowalewski, S., and Abel, D., "Safety Verification of a Cooperative Vehicle Platoon with Uncertain Inputs Using Zonotopes", in *Proc. Proceedings of the 18th IFAC World Congress, 2011 : August 28 - September 2, 2011, Università Cattolica del Sacro Cuore, Milano Italy / Ed.: Sergio Bittanti ...*, Milano, Italy, 2011 in IFAC-PapersOnLine, Curran, pp. 9769-9774.

## Safety Verification of a Cooperative Vehicle Platoon with Uncertain Inputs Using Zonotopes

### Bibtex entry :

```
@inproceedings { BMH+11,
  author = { Ben Makhlof, Ibtissem and Maschuw, Jan P. and
    H{"a"}nsch, Paul and Diab, Hilal and Kowalewski, Stefan and Abel, Dirk },
  title = { Safety Verification of a Cooperative Vehicle Platoon
    with Uncertain Inputs Using Zonotopes },
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    August
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    Cuore, Milano Italy / Ed.: Sergio Bittanti ... },
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    url = { http://publications.rwth-aachen.de/record/100991 },
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[DFD+11]

[PDFBIB](#)

Dernehl, C., Franke, D., Diab, H., and Kowalewski, S., "An Architecture with Integrated Image Processing for Autonomous Micro Aerial Vehicles", in *Proc. International Micro Air Vehicle conference and competitions 2011 (IMAV 2011)*, 't Harde, The Netherlands, September 12-15, 2011, 2011, IMAV, pp. 138-145.

## An Architecture with Integrated Image Processing for Autonomous Micro Aerial Vehicles

### Bibtex entry :

```
@inproceedings { DFD+11,
    author = { Dernehl, Christian and Franke, Dominik and Diab, Hilal
and
    Kowalewski, Stefan },
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Autonomous Micro Aerial Vehicles },
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    year = { 2011 },
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    url = { http://publications.rwth-aachen.de/record/128268 },
}
```

[MDA+11]

[PDFBIB](#)

Maschuw, J. P., Diab, H., Abel, D., and Kowalewski, S., "Control Design for Generalized Platoon Problems", *Automatisierungstechnik : at*, vol. 59, iss. 12, pp. 721-729, 2011

# Control Design for Generalized Platoon Problems

## Bibtex entry :

```
@article { MDA+11,  
  author = { Maschuw, Jan P. and Diab, Hilal and Abel, Dirk and  
            Kowalewski, Stefan },  
  title = { Control Design for Generalized Platoon Problems },  
  journal = { Automatisierungstechnik : at },  
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  address = { M{"u"}nchen },  
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  doi = { 10.1524/auto2011.0965 },  
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```

[CBD+10]

[PDFBIB](#)

Chávez Grunewald, M. G., Ben Makhlouf, I., Diab, H., Abel, D., and Kowalewski, S., "On the Effects of Network Delays on an Energy-based Controller", , TuPO11.1, 2010.

## On the Effects of Network Delays on an Energy-based Controller

## Bibtex entry :

```
@techreport { CBD+10,  
  author = { Chávez Grunewald, Martin Guillermo and Ben Makhlouf,  
            Ibtissem and Diab, Hilal and Abel, Dirk and Kowalewski,  
            Stefan },  
  title = { On the Effects of Network Delays on an Energy-based  
            Controller },  
  booktitle = { NecSys'10 : 2nd IFAC Workshop on Distributed  
            Estimation and  
            Control in Networked Systems ; 13-14 September, 2010, Centre  
            de Congrès de L'Impérial Palace, Annecy, France },  
  pages = { 169-174 },  
  number = { TuPO11.1 },  
  year = { 2010 },  
  typ = { PUB:(DE-HGF)8 },  
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}

[CBD+10a]

[PDFBIB](#)

Chávez Grunewald, M. G., Ben Makhlouf, I., Diab, H., Mut, V., Kowalewski, S., and Abel, D., "Regelung und Sicherheitsanalyse einer Gruppe Massenpunktfahrzeuge mit Hilfe energiebasierter Methoden", in *Proc. Automatisierungstechnik : at*, München, 2010, vol. 58, Oldenbourg, pp. 227-235.

## Regelung und Sicherheitsanalyse einer Gruppe Massenpunktfahrzeuge mit Hilfe energiebasierter Methoden

**Bibtex entry :**

```
@inproceedings { CBD+10a,
  author = { Chávez Grunewald, Martin Guillermo and Ben Makhlouf,
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}
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[DCB+10]

[PDFBIB](#)

Diab, H., Chávez Grunewald, M. G., Ben Makhlouf, I., Abel, D., and Kowalewski, S., "A testing platform for cooperative vehicle platoon controllers", in *Proc. 13th International IEEE Conference on Intelligent Transportation Systems : ITSC 2010 ; 19 - 22 September, 2010, Madeira Island, Portugal ; conference proceedings / IEEE*, Piscataway, NJ, 2010, IEEE, pp. 1718-1723.

## A testing platform for cooperative vehicle platoon controllers

**Bibtex entry :**

```
@inproceedings { DCB+10,
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```

author = { Diab, Hilal and Chávez Grunewald, Martin Guillermo and
Ben
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booktitle = { 13th International IEEE Conference on Intelligent
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2010, Madeira Island, Portugal ; conference proceedings /
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url = { http://publications.rwth-aachen.de/record/118439 },
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[DBK+09]

PDFBIB

Diab, H., Ben Makhlouf, I., Kowalewski, S., Chávez, M., and Abel, D., "Control and Safety Analysis of a Platoon under Communication Constraints", in *Proc. NE\[/S/T\]COC, Sept. 28/29, Stuttgart, Priority Program 1305 Posters S.5, 2009, pp. 70-71.*

## Control and Safety Analysis of a Platoon under Communication Constraints

### Bibtex entry :

```

@inproceedings { DBK+09,
author = { Diab, Hilal and Ben Makhlouf, Ibtissem and Kowalewski,
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title = { Control and Safety Analysis of a Platoon under
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Constraints },
booktitle = { NE\[/S/T\]COC, Sept. 28/29, Stuttgart, Priority
Program 1305
Posters S.5 },
pages = { 70-71 },
year = { 2009 },
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cin = { 416610 / 122810 },
url = { http://publications.rwth-aachen.de/record/100238 },
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# Abschlussarbeiten

- \* Sichere Überquerung einer Kreuzung mit einer Fahrzeugkolonne
- \* Effiziente Überquerung einer ampelgesteuerten Kreuzung mit einer Fahrzeugkolonne
- \* [Unterstützung eines fahrzeuginternen Ortungssystems durch Sensorfusion](#)

## Lehre

- Wintersemester 2011/2012
  - [Praktikum Systemprogrammierung](#)
- Sommersemester 2011
  - [Praktikum Systemprogrammierung](#)
  - [Entwicklung NXT gesteuerter LEGO-Fahrzeuge mit Java](#)
- Wintersemester 2010/2011
  - [Hardwarenahe Programmierung](#)
- Sommersemester 2010
  - [Automatisierungssoftware](#)
- Wintersemester 2009/2010
  - [Einführung in die Technische Informatik](#)

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<https://www.embedded.rwth-aachen.de/doku.php?id=lehrstuhl:mitarbeiter:diab>

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