

# Dr.-Ing. Hilal Diab

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Büro: Raum 2321 (Gebäude H)

## Interessen

- Erreichbarkeitsanalyse hybrider Systeme
- Skalierte Fahrzeuge als Versuchsträgers 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 },
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http://publications.rwth-aachen.de/record/465272/files/465272_source.zip },
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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 },
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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 = { Hänsch, Paul and Diab, Hilal and Ben Makhlof,
Ibtissem
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    title = { Reachability Analysis of Linear Systems with Stepwise
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    journal = { Electronic notes in theoretical computer science :
ENTCS },
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    volume = { 297 },
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[BDK12]

[PDFBIB](#)

Ben Makhlof, 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 Makhlof, Ibtissem and Diab, Hilal and Kowalewski,
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Design of Hybrid Systems (ADHS 12), Eindhoven, NL },
pages = { 333-338 },
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Hybrid Systems,
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doi = { 10.3182/20120606-3-NL-3011.00053 },
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[DBK12]

[PDFBIB](#)

Diab, H., Ben Makhlof, 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 Makhlof, Ibtissem and Kowalewski,
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    booktitle = { 2012 15th International IEEE Conference on
Intelligent
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              Anchorage, Alaska, USA },
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Transportation Systems, Anchorage (USA), 16-09-2012 -
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    url = { http://publications.rwth-aachen.de/record/197725 },
}
```

[RDK+12]

[PDFBIB](#)

Reuter, S., Diab, H., Kowalewski, S., Hauck, E., and Jeschke, S., "Design and implementation of a vehicle dynamics control system by means of torque vectoring for an autonomous vehicle", in *Proc. IEEE International Conference on Robotics and Biomimetics (ROBIO), 2012 : 11 - 14 Dec. 2012, Guangzhou, China / 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 { RDK+12,
    author = { Reuter, Sebastian and Diab, Hilal and Kowalewski, Stefan and
              Hauck, Eckart and Jeschke, Sabina },
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                  (ROBIO), 2012 : 11 - 14 Dec. 2012, Guangzhou, China /
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    pages = { 1691-1696 },
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    organization = { 2012 IEEE International Conference on Robotics and
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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 withUncertain Inputs Using Zonotopes

## Bibtex entry :

```
@inproceedings { BMH+11,
    author = { Ben Makhlof, Ibtissem and Maschuw, Jan P. and
H{"a}nsch,
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withUncertain Inputs Using Zonotopes },
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        28 - September 2, 2011, Università Cattolica del Sacro
Cuore, Milano Italy / Ed.: Sergio Bittanti ... },
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    pages = { 9769-9774 },
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2011-08-28 -
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    url = { http://publications.rwth-aachen.de/record/100991 },
}
```

[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
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        Kowalewski, Stefan },
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    booktitle = { International Micro Air Vehicle conference and }
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competitions
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organization = { International Micro Air Vehicle conference and
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doi = { 10.4233/uuid:19adedb6-e3d9-4cff-8ebc-6497b026adfe },
typ = { PUB:(DE-HGF)8 },
reportid = { RWTH-CONV-198392 },
cin = { 122810 / 120000 },
url = { http://publications.rwth-aachen.de/record/128268 },
}

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[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 },
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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 Makhlof,
              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
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                 de Congrès de L'Impérial Palace, Annecy, France },
    pages = { 169-174 },
    number = { TuP011.1 },
    year = { 2010 },
    organization = { 2. IFAC Workshop on Distributed Estimation and
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    typ = { PUB:(DE-HGF)8 },
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    url = { http://publications.rwth-aachen.de/record/118448 },
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[CBD+10a]

[PDF](#)

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

## Regelung und Sicherheitsanalyse einer Gruppe Massenpunkt Fahrzeuge mit Hilfe energiebasierter Methoden

**Bibtex entry :**

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@inproceedings { CBD+10a,
    author = { Chávez Grunewald, Martin Guillermo and Ben Makhlof,
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    title = { Regelung und Sicherheitsanalyse einer Gruppe
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volume = { 58 },
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[DCB+10]

[PDFBIB](#)

Diab, H., Chávez Grunewald, M. G., Ben Makhlof, 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,
    author = { Diab, Hilal and Chávez Grunewald, Martin Guillermo and Ben
Makhlof, Ibtissem and Abel, Dirk and Kowalewski, Stefan },
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    booktitle = { 13th International IEEE Conference on Intelligent
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IEEE },
    publisher = { IEEE },
    pages = { 1718-1723 },
    year = { 2010 },
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Transportation Systems, Madeira Island (Portugal),
2010-09-19 - 2010-09-22 },
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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,
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    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/> - **Informatik 11 - Embedded Software**



Permanent link:

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

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