

Martin Schweigler, M.Sc. RWTH

Contact



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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.

Ongoing

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Past

- [A GPS-aided Inertial Navigation System for Pedelecs](#)
- [Enhanced Pedelec Odometry supported by Acceleration Measurement](#)
- [Concept and Implementation of a Real-Time Lane Position Estimation System with Side Cameras using Deep Learning Algorithms for Autonomous Vehicles](#)
- [Balance Point dependent Vehicle Dynamics Control](#)
- [Tethering semi-autonomous Vehicles by relative Positioning](#)

- [Enhanced GPS positioning using a smartphone IMU and odometer](#)
- [Development of a communication unit to control a pedelec](#)
- [Ground surface pattern recognition for enhanced positioning](#)

Teaching

SS2017

- [Cyber-Physische Systeme in Medizintechnik und Mobilität](#) (S)

WS2017/18:

- [Dynamic Systems for Computer Scientists](#) (V)
- [Cyber-Physische Systeme in Medizintechnik und Mobilität](#) (S)

SS2017

- [Eingebettete Software in Medizintechnik & eMobilität](#) (S)

WS2016/17:

- [Dynamic Systems for Computer Scientists](#) (V)
- [Eingebettete Software in Medizintechnik & eMobilität](#) (S)

SS2016:

- [Eingebettete Software in Medizintechnik & eMobilität](#) (S)

WS2015/16:

- [Dynamic Systems for Computer Scientists](#) (V)
- [Eingebettete Signalverarbeitung in Medizintechnik & eMobilität](#) (S)

SS2015:

- [Eingebettete Signalverarbeitung in Medizintechnik & eMobilität](#) (S)

WS2014/15:

- [Dynamic Systems for Computer Scientists](#) (V)
- [Entwicklung von Fahrerinformationssystemen mit Android und OpenXC](#) (P)
- [Ausgesuchte Themen zur Eingebetteten Software](#) (S)

SS2014:

- [NXT-Programmierung mit Java](#) (P)

Projects and Committees

- [Project engineer in the Ford global mobility challenge 2016](#)

- Project engineer in the project Real-Time Demonstrator 2015
- Colaboration in the Velocity Aachen project 2015-2016
- Advisor of the Carolo-Cup teams 2015-2017
- Colaboration in the project Mobility & Transport Engineering 2014-2015
- Colaboration in the Future Mobility Lab 2014-2017
- Member of the examination board automation technology 2013-2017

Patents

- Elektrisch angetriebene Transportvorrichtung für wenigstens eine Person sowie Steuerungsverfahren hierfür (102016217804.0, 16.09.2016)
- Transportsystem mit automatischer Folgefunktion sowie Steuerungsverfahren (102016217805.9, 16.09.2016)
- Verfahren zur Vortriebssteuerung eines dreispurigen Fahrzeugs sowie Fahrzeug (102016221367.9, 28.10.2016)
- Fahrzeug mit elektromotorisch angetriebenen Rädern und Verfahren zum Lenken desselben (102016221366.0, 28.10.2016)
- Tethering of a Semi-Autonomous Vehicle (83866252, 03.08.2017)
- Conveying System with an Automatic Tethering Function (FMC 8418 PUSA, 14.09.2017)

Publications

[Sch21]

[PDF](#)[BIB](#)

Schweigler, M., "Ground surface pattern recognition for enhanced navigation", PhD Thesis, Aachen, 2021.

Ground surface pattern recognition for enhanced navigation

Bibtex entry :

```
@phdthesis { Sch21,
  author = { Schweigler, Martin },
  othercontributors = { Kowalewski, Stefan and Abel, Dirk },
  title = { Ground surface pattern recognition for enhanced
navigation },
  publisher = { RWTH Aachen University },
  school = { RWTH Aachen University },
  pages = { 1 Online-Ressource : Illustrationen, Diagramme, Karten },
  series = { Aachener Informatik-Berichte },
  year = { 2021 },
  address = { Aachen },
  doi = { 10.18154/RWTH-2021-05828 },
  typ = { PUB:(DE-HGF)11 },
  reportid = { RWTH-2021-05828 },
  cin = { 122810 / 120000 },
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url = {  
http://publications.rwth-aachen.de/record/820793/files/820793.pdf },  
}
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[GSA+18]

[PDFBIB](#)

Grochowski, M., Schweigler, M., Alrifaae, B., and Kowalewski, S., "A GPS-aided Inertial Navigation System for Vehicular Navigation using a Smartphone", *IFAC-PapersOnLine*, vol. 51, iss. 10, pp. 121-126, 2018

A GPS-aided Inertial Navigation System for Vehicular Navigation using a Smartphone

Bibtex entry :

```
@article { GSA+18,  
  author = { Grochowski, Marco and Schweigler, Martin and Alrifaae,  
    Bassam and Kowalewski, Stefan },  
  title = { A GPS-aided Inertial Navigation System for Vehicular  
    Navigation using a Smartphone },  
  journal = { IFAC-PapersOnLine },  
  pages = { 121-126 },  
  volume = { 51 },  
  number = { 10 },  
  year = { 2018 },  
  address = { Laxenburg },  
  issn = { 2405-8963 },  
  organization = { 3. IFAC Conference on Embedded Systems,  
    Computational  
    Intelligence and Telematics in Control, Farod (Portugal),  
    2018-06-06 - 2018-06-08 },  
  doi = { 10.1016/j.ifacol.2018.06.247 },  
  typ = { PUB:(DE-HGF)16 },  
  reportid = { RWTH-2018-227583 },  
  cin = { 122810 / 120000 },  
  url = { http://publications.rwth-aachen.de/record/731577 },  
}
```

[SGT+18]

[PDFBIB](#)

Schweigler, M., Grochowski, M., Tamrakar, S., and Kowalewski, S., "Ground Surface Pattern Recognition with Hidden Markov Models for Low Cost Positioning Improvement", in *Proc. 8th International Conference on Pattern Recognition Systems (ICPRS 2017) : 11-13 July 2017*, [Stevenage], 2018, IET, pp. 1-6.

Ground Surface Pattern Recognition with Hidden Markov Models for Low Cost Positioning Improvement

Bibtex entry :

```
@inproceedings { SGT+18,
  author = { Schweigler, Martin and Grochowski, Marco and Tamrakar,
    Sujan
      and Kowalewski, Stefan },
  title = { Ground Surface Pattern Recognition with Hidden Markov
    Models
      for Low Cost Positioning Improvement },
  booktitle = { 8th International Conference on Pattern Recognition
    Systems
      (ICPRS 2017) : 11-13 July 2017 },
  publisher = { IET },
  pages = { 1-6 },
  year = { 2018 },
  address = { [Stevenage] },
  organization = { 8. International Conference of Pattern Recognition
    Systems,
      Madrid (Spain), 2017-07-11 - 2017-07-13 },
  doi = { 10.1049/cp.2017.0166 },
  typ = { PUB:(DE-HGF)7 },
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  cin = { 122810 / 120000 },
  url = { http://publications.rwth-aachen.de/record/752258 },
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[KBS+17]

[PDFBIB](#)

Kühn, J., Brendle, C., Stollenwerk, A., Schweigler, M., Kowalewski, S., Janisch, T., Rossaint, R., Leonhardt, S., Walter, M., and Kopp, R., "Decentralized safety concept for closed-loop controlled intensive care : Supervision of a blood pump during extracorporeal circulation", *Biomedical engineering = Biomedizinische Technik*, vol. 62, iss. 2, pp. 213-224, 2017

Decentralized safety concept for closed-loop controlled intensive care : Supervision of a blood pump during extracorporeal circulation

Bibtex entry :

```
@article { KBS+17,
  author = { K{"u}hn, Jan and Brendle, Christian and Stollenwerk,
    André
      and Schweigler, Martin and Kowalewski, Stefan and Janisch,
      Thorsten and Rossaint, Rolf and Leonhardt, Steffen and
      Walter, Marian and Kopp, R{"u}dger },
  title = { Decentralized safety concept for closed-loop controlled
    intensive care : Supervision of a blood pump during
    extracorporeal circulation },
  journal = { Biomedical engineering = Biomedizinische Technik },
  publisher = { de Gruyter },
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pages = { 213-224 },
volume = { 62 },
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issn = { 1862-278X },
doi = { 10.1515/bmt-2016-0087 },
typ = { PUB:(DE-HGF)16 },
reportid = { RWTH-2017-09486 },
cin = { 611010 / 122810533000-2533000-3 / 120000533000-3533000-2 },
url = { http://publications.rwth-aachen.de/record/707857 },
}
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[TSN+16]

PDFBIB

Thönnessen, D., Schweigler, M., Ney, O., and Kugelmeier, M., "Conveying system with an automatic tethering function", 2016.

Conveying system with an automatic tethering function

Bibtex entry :

```
@techreport { TSN+16,
  author = { Th{"o"}nnessen, David and Schweigler, Martin and Ney,
Oliver
    and Kugelmeier, Mirko },
  title = { Conveying system with an automatic tethering function },
  pages = { 1-7 },
  year = { 2016 },
  typ = { PUB:(DE-HGF)23 },
  reportid = { RWTH-CONV-236287 },
  url = {
https://worldwide.espacenet.com/patent/search?q=pn%3DUS20180081372A1 },
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