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Research Activities

Within my research activities I currently elaborate on model-based techniques to analyse variant-rich model-based product lines of embedded software. To this end, I apply existing frameworks of the Eclipse framework to analyse Matlab/Simulink models with respect to different challenges. These challenges are mainly related to the complexity of such models which are caused by an increasing number of variants covered by a Simulink model and by historical growth. To manage the complexity I create logical views on Simulink models and link different software development process artefacts (i.e. implementation, requirements and tests) as well as features. Details about the research topic can be found [here](#).

Teaching

- Winter term 08/09:
 1. [Introduction to Technical Computer Science](#)
- Winter term 09/10:
 1. [Komponentenbasierte Softwareentwicklung am Beispiel von Android](#)
 2. [Hardwarenahe Programmierung](#) (Betreuung eines Versuchs)
- Winter term 10/11:
 1. [Model-based Analysis of Simulink Models](#)
 2. [Hardwarenahe Programmierung](#) (Betreuung eines Versuchs)

Theses

I continuously derive topics for theses from my research activities. If you are interested in a thesis please contact me via email.

Publications

[Mer14]

[PDFBIB](#)

Merschen, D., "Integration und Analyse von Artefakten in der modellbasierten Entwicklung

eingebetteter Software", PhD Thesis, Aachen, 2014.

Integration und Analyse von Artefakten in der modellbasierten Entwicklung eingebetteter Software

Bibtex entry :

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@phdthesis { Mer14,  
  author = { Merschen, Daniel },  
  othercontributors = { Kowalewski, Stefan },  
  title = { Integration und Analyse von Artefakten in der  
    modellbasierten Entwicklung eingebetteter Software },  
  publisher = { Shaker },  
  pages = { XIV, 136 S. : graph. Darst. },  
  series = { Aachener Informatik-Berichte },  
  year = { 2014 },  
  address = { Aachen },  
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[MGP+13]

[PDFBIB](#)

Merschen, D., Gleis, R., Pott, J., and Kowalewski, S., "Analysis of Simulink Models Using Databases and Model Transformations", in *Proc. Model-Based Methodologies for Pervasive and Embedded Software : 8th International Workshop, MOMPES 2012, Essen, Germany, September 4, 2012. Revised Papers / edited by Ricardo J. Machado, Rita Suzana P. Maciel, Julia Rubin, Goetz Botterweck*, Berlin, Heidelberg, 2013 in *Lecture Notes in Computer Science*, Springer, pp. 69-84.

Analysis of Simulink Models Using Databases and Model Transformations

Bibtex entry :

```
@inproceedings { MGP+13,  
  author = { Merschen, Daniel and Gleis, Robert and Pott, Julian and  
    Kowalewski, Stefan },  
  title = { Analysis of Simulink Models Using Databases and Model  
    Transformations },  
  booktitle = { Model-Based Methodologies for Pervasive and Embedded  
    Software : 8th International Workshop, MOMPES 2012, Essen,  
    Germany, September 4, 2012. Revised Papers / edited by  
    Ricardo J. Machado, Rita Suzana P. Maciel, Julia Rubin,  
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pages = { 69-84 },
series = { Lecture Notes in Computer Science },
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    Software : 8. International Workshop, Essen (Germany),
    2012-09-04 - 2012-09-04 },
doi = { 10.1007/978-3-642-38209-3_5 },
typ = { PUB:(DE-HGF)7 },
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cin = { 122810 / 120000 },
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[WGM+13]

[PDFBIB](#)

Wiechowski, N., Gerlitz, T., Merschen, D., and Kowalewski, S., "Ein Ansatz zum merkmalsbasierten Konsistenzmanagement in der Produktlinienentwicklung", in *Proc. Informatiktage 2013 : smart life - dank Informatik ; fachwissenschaftlicher Informatik-Kongress 22. und 23. März 2013 B-IT Bonn-Aachen International Center for Information Technology, Bonn / Gesellschaft für Informatik (Hrsg.). [Red.: Ludger Porada]*, Bonn, 2013 in GI-Edition : lecture notes in informatics, Gesellschaft für Informatik e.V., pp. 2502-2516.

Ein Ansatz zum merkmalsbasierten Konsistenzmanagement in der Produktlinienentwicklung

Bibtex entry :

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@inproceedings { WGM+13,
  author = { Wiechowski, Norbert and Gerlitz, Thomas and Merschen,
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  title = { Ein Ansatz zum merkmalsbasierten Konsistenzmanagement in
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  booktitle = { Informatiktage 2013 : smart life - dank Informatik ;
fachwissenschaftlicher Informatik-Kongress 22. und 23.
M{"a"}rz 2013 B-IT Bonn-Aachen International Center for
Information Technology, Bonn / Gesellschaft f{"u"}r
Informatik (Hrsg.). [Red.: Ludger Porada] },
  publisher = { Gesellschaft f{"u"}r Informatik e.V. },
  pages = { 2502-2516 },
  series = { GI-Edition : lecture notes in informatics },
  year = { 2013 },
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life -
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[MDH+12]

[PDFBIB](#)

Merschen, D., Duhr, Y., Hedenetz, B., and Kowalewski, S., "Evolutionsunterstützung für komplexe, modellbasierte Software-Produktlinien", in *Proc. Tagungsband - Embedded Software Engineering Kongress 2012 : 3. bis 7. Dezember 2012, Sindelfingen, Würzburg, 2012*, Elektronikpraxis, Vogel Business Media GmbH & Co. KG - München \: MicroConsult Microelectronics Consulting & Training GmbH, pp. 65-71.

Evolutionsunterstützung für komplexe, modellbasierte Software-Produktlinien

Bibtex entry :

```
@inproceedings { MDH+12,  
  author = { Merschen, Daniel and Duhr, Yves and Hedenetz, Bernd and  
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  title = { Evolutionsunterst{"u"}tzung f{"u"}r komplexe,  
modellbasierte  
            Software-Produktlinien },  
  booktitle = { Tagungsband - Embedded Software Engineering Kongress  
2012 :  
            3. bis 7. Dezember 2012, Sindelfingen },  
  publisher = { Elektronikpraxis, Vogel Business Media GmbH & Co. KG  
-  
            M{"u"}nchen \: MicroConsult Microelectronics Consulting &  
            Training GmbH },  
  pages = { 65-71 },  
  year = { 2012 },  
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  url = { http://publications.rwth-aachen.de/record/752298 },  
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[MDR+12]

[PDFBIB](#)

Merschen, D., Duhr, Y., Ringler, T., Hedenetz, B., and Kowalewski, S., "Model-Based Analysis of Design Artefacts Applying an Annotation Concept", in *Proc. Proceedings 198 Software Engineering 2012 - Fachtagung des GI-Fachbereichs Softwaretechnik : 27. Februar - 2. März 2012 in Berlin / Jählich, Stefan [Hrsg.] ; Küpper, Axel [Hrsg.] ; Albayrak, Sahin [Hrsg.]*, Bonn, 2012 in GI-Edition : Proceedings, Gesellschaft für Informatik e.V., pp. 169-180.

Model-Based Analysis of Design Artefacts Applying an Annotation Concept

Bibtex entry :

```
@inproceedings { MDR+12,  
  author = { Merschen, Daniel and Duhr, Yves and Ringler, Thomas and  
    Hedenetz, Bernd and Kowalewski, Stefan },  
  title = { Model-Based Analysis of Design Artefacts Applying an  
    Annotation Concept },  
  booktitle = { Proceedings 198 Software Engineering 2012 -  
    Fachtagung des  
      GI-Fachbereichs Softwaretechnik : 27. Februar - 2. M{"a"}rz  
      2012 in Berlin / J{"a"}hnichen, Stefan [Hrsg.] ; K{"u"}pper,  
      Axel [Hrsg.] ; Albayrak, Sahin [Hrsg.] },  
  publisher = { Gesellschaft f{"u"}r Informatik e.V. },  
  pages = { 169-180 },  
  series = { GI-Edition : Proceedings },  
  year = { 2012 },  
  address = { Bonn },  
  organization = { 198 Software Engineering 2012 - Fachtagung des  
    GI-Fachbereichs Softwaretechnik, Berlin (Germany),  
    27-02-2012 - 02-03-2012 },  
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  cin = { 120000 / 122810 },  
  url = {  
    http://subs.emis.de/LNI/Proceedings/Proceedings198/article6657.html },  
}
```

[MPK12]

[PDFBIB](#)

Merschen, D., Pott, J., and Kowalewski, S., "Integration and Analysis of Design Artefacts in Embedded Software Development", in *Proc. IEEE 36th Annual Computer Software and Applications Conference workshops (COMPSACW), 2012 : 16 - 20 July 2012, Izmir, Turkey / sponsored by IEEE; IEEE Computer Society. Ed.: Xiaoying Bai ...*, Piscataway, NJ, 2012, IEEE, pp. 503-508.

Integration and Analysis of Design Artefacts in Embedded Software Development

Bibtex entry :

```
@inproceedings { MPK12,  
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    Software Development },  
  booktitle = { IEEE 36th Annual Computer Software and Applications
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Conference workshops (COMPSACW), 2012 : 16 - 20 July 2012,
Izmir, Turkey / sponsored by IEEE; IEEE Computer Society.
Ed.: Xiaoying Bai ... },
publisher = { IEEE },
pages = { 503-508 },
year = { 2012 },
address = { Piscataway, NJ },
organization = { IEEE 36. Annual Computer Software and Applications
Conference workshops, Izmir (Turkey), 2012-07-16 -
2012-07-20 },
doi = { 10.1109/COMPSACW.2012.94 },
typ = { PUB:(DE-HGF)7 },
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[MPB+11]

[PDFBIB](#)

Merschen, D., Polzer, A., Botterweck, G., and Kowalewski, S., "Experiences of Applying Model-based Analysis to Support the Development of Automotive Software Product Lines", in *Proc. VaMoS 11 : fifth International Workshop on Variability Modelling of Software-intensive Systems ; 27 -29 January, 2011, Namur, Belgium ; proceedings / Krzysztof Czarnecki ... (eds.)*, New York, NY, 2011, ACM, pp. 141-150.

Experiences of Applying Model-based Analysis to Support the Development of Automotive Software Product Lines

Bibtex entry :

```
@inproceedings { MPB+11,
  author = { Merschen, Daniel and Polzer, Andreas and Botterweck,
    G{\\"o}tz and Kowalewski, Stefan },
  title = { Experiences of Applying Model-based Analysis to Support
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    Development of Automotive Software Product Lines },
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Variability
    Modelling of Software-intensive Systems ; 27 -29 January,
    2011, Namur, Belgium ; proceedings / Krzysztof Czarnecki ...
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  publisher = { ACM },
  pages = { 141-150 },
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    2011-01-29 },
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    url = { http://publications.rwth-aachen.de/record/120031 },
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[PMB+11]

[PDF](#)BIB

Polzer, A., Merschen, D., Botterweck, G., Pleuss, A., Thomas, J., Hedenetz, B., and Kowalewski, S., "Managing Complexity and Variability of a Model-based Embedded Software Product Line", *Innovations in systems and software engineering*, vol. 2011, pp. 1-15, 2011

Managing Complexity and Variability of a Model-based Embedded Software Product Line

Bibtex entry :

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@article { PMB+11,
  author = { Polzer, Andreas and Merschen, Daniel and Botterweck,
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  title = { Managing Complexity and Variability of a Model-based
    Embedded Software Product Line },
  journal = { Innovations in systems and software engineering },
  publisher = { Springer },
  pages = { 1-15 },
  volume = { 2011 },
  year = { 2011 },
  address = { London },
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  url = { http://publications.rwth-aachen.de/record/191115 },
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```

[PMT+10]

[PDF](#)BIB

Polzer, A., Merschen, D., Thomas, J., Hedenetz, B., and Kowalewski, S., "View-Supported Rollout and Evolution of Model-Based ECU Applications", in *Proc. 7th International Workshop on Model-based Methodologies for Pervasive*, New York, NY, 2010, ACM, pp. 37-44.

View-Supported Rollout and Evolution of Model-Based ECU Applications

Bibtex entry :

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@inproceedings { PMT+10,  
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and  
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  pages = { 37-44 },  
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  address = { New York, NY },  
  organization = { 7. International Workshop on Model-based  
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