

# Dr. Markus Völter (Voelter)

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**Born** February 14, 1974, in Heidenheim/Brenz, Germany  
**Degrees** Dipl. Ing. (FH) Physikalische Technik (Physics Eng.)  
PhD In Computer Science



*LAST CHANGED 05/2018*

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Markus works as an independent researcher, consultant and coach for language engineering, domain specific languages, model-driven software development, product lines and software architecture. He helps bridge the gap from industry and business domains to software systems: he analyses domains, design user-friendly languages and supporting analyses, and implements language tools and IDEs, and architects efficient and reliable backends based on interpreters and generators. He also work on formalisms and meta-tools for language engineering.

For 20 years, Markus has consulted, coached and developed in a wide range of industries, including finance, automotive, health, science and IT. He has published numerous papers in peer-reviewed conferences and journals, has written several books on the subject and spoken at many industry conferences world-wide. Markus has a diploma in technical physics from FH Ravensburg-Weingarten and a PhD in computer science from TU Delft. He is a member of the [ACM](#), [Hillside Europe](#) and the [IFIP WG 2.16 on Programming Language Design](#).

A abbreviated version of this CV is at: <http://voelter.de/data/cv/cv-brief.pdf>

A list of every publication/talk, including PDFs and slides, is at: <http://voelter.de>

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## Education & Professional Work

2010 - 2014

PhD with Prof. Dr. Eelco Visser and his Software Language Design and Engineering research group at TU Delft

Researching *Generic Tools, Specific Languages*, the concept of using language engineering and language workbenches to tackle problems in domains and areas where languages have not traditionally been applied. mbeddr is the case study for such systems.

2009 - current

Independent Researcher, Architect and Consultant for itemis

My main customer since 2009 is itemis AG in Stuttgart, where we are developing languages based on the JetBrains MPS language workbench. I am co-program manager for all projects relating to MPS and lead the research activities in language engineering.

2007 - 2008 (ca. 11 months)

Independent Consultant for Intentional Software

Helped with Intentional's customer projects, for example, the Achmea insurance in the Netherlands. Worked on tutorials for and gave feedback to the developers of the Intentional Domain Workbench.

2002 - current

Independent Consultant, voelter – ingenieurbüro für softwaretechnologie

Focus on software language engineering, domain-specific languages, software architecture, model-driven software development and product line engineering in embedded, enterprise and business systems. Working for companies all over Europe in these areas.

2000 - 2002 (ca. 22 months)

Mathema AG, Senior Consultant, Technical Lead for Mathema's Ulm office, and Mathema's chief technologist.

My main task at Mathema was technical lead of the Ulm office. Additionally, I was assigned several projects as consultant (architecture, technology, J2EE) and gave trainings on topics relating to object-oriented software development. Within Mathema I was also responsible for the technological focus of the company, for the evaluation of new technologies, and for the training of the employees.

1995 - 2000

Independent Developer and Consultant, völderSOFTWARE

Part-time while was studying, later full-time. Several development, training and consulting projects, among others for IBM and DaimlerChrysler.

1994 - 1999

Study of Technical Physics at Ravensburg-Weingarten  
University of Applied Sciences (Fachhochschule)

Finished as Dipl. Ing. (FH) with a average grade of 1,3. Specialization in robot and sensor technology. Practical semesters at ict (development of a medical lab information system in Clipper), DASA (CORBA with C++ and Java) and at Klinikum Heidenheim hospital (Intranet, Internet).

1993 - 1994

Community Service (Zivildienst) at Klinikum Heidenheim Hospital  
Department of Finance and Controlling

Creation of several statistics and reports with Excel, development of several support tools for data entry, analysis and evaluation.

1993

Abitur at Werkgymnasium Heidenheim/Brenz

Math and Physics Leistungskurs, average grade 1,3.

## **Core Skills**

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### **Technical Competence**

While I am an expert in a few very specific topics, I have a very good and broad overview over software engineering, from years of experience in different fields as well as from reading many books, recording more than 120 SE Radio podcasts, and from hanging out on many industry and academic conferences. I like to work on the conceptual level (see my publications) and on the applied level (see my list of projects).

### **Innovative**

I have pioneered several (now established) techniques in industry: Eclipse-based business applications (when there was no RCP yet); generative component infrastructures (which led to being hired by BMW to build the AUTOSAR proof of concept); GMF-style generation of graphical editors (when there was only GEF on Eclipse); model-driven development and textual DSLs (when UML was mainstream); and using projectional editing for exploiting modular languages and mixing DSLs and GPLs (as exemplified in the mbeddr project).

### **Motivation and Leadership**

If I am enthusiastic about a topic or approach, I am very good at getting others motivated as well; I am good at understanding the various positions of team members, reflect them, make a decision and then communicate the result.

### **Communication**

I am a good communicator. I have very good skills in written and spoken English (see my books) and written and spoken technical communication. I can systematically explain complex topics (a skill obtained partially from interviewing many people in podcasts and from conference talks). I can understand and recap customer requirements. I like to apply these skills in the context of technical PR and technical marketing.

### **Engaging Speaker**

I love public speaking, and I am known to be a competent, engaging and entertaining presenter. I have done over 200 talks at conferences and recorded and published over 250 podcast episodes (ca. 130 about software, the rest about other science and engineering topics).

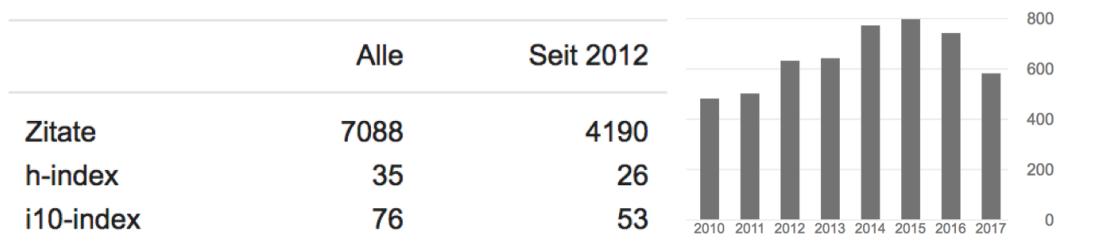
# Research, Publications and Talks

## My PhD Thesis: Generic Tools, Specific Languages

Today's software engineering tools are hard to adapt to particular domains. A major reason is that while platforms such as Eclipse support easy extension of the *tool* (views, editors, buttons, menus) they do not easily support the extension of the data formats or *languages* that underlie a tool. My thesis introduces and evaluates a new approach to developing domain-specific software engineering tools called Generic Tools, Specific Languages. It shifts the focus from adapting the engineering tool to the adapting the underlying languages. It relies on language workbenches (the generic tool) and recent advances in language engineering, particularly, user-friendly projectional editing.

The thesis introduces the approach and relates it to existing approaches in tool development and language engineering. To validate the approach, the thesis relies on mbeddr, an extensible set of integrated languages for embedded software engineering. mbeddr is discussed below, in the section on research projects.

## Citations, Indices (from Google Scholar)



<http://scholar.google.nl/citations?user=pEijGjUAAAAAJ&hl=en>

## Five Most Important Publications

1. [Book] M. Voelter, T. Stahl. *Model-Driven Software Development – Technology, Engineering, Management*. Updated translation of the German MDSB book, Wiley & Sons, 2006
2. [Book] M. Voelter + Contributors. *DSL Engineering - Designing, Implementing and Using Domain-Specific Languages*. CreateSpace Publishing Platform (self-published), [dslbook.org](http://dslbook.org), 2013
3. [Conference Paper] M. Voelter, A. van Deursen, B. Kolb, S. Eberle. *Using C Language Extensions for Developing Embedded Software: A Case Study*. OOPSLA 2015, 20 pages, 2015
4. [Journal Paper] M. Voelter, B. Kolb, T. Szabo, D. Ratiu, A. van Deursen. Lessons learned from building mbeddr – a case study in language engineering. *International Journal on Software and Systems Modeling (SOSYM)*, January 2017, 46 pages, <http://rdcu.be/oo3W>, 2017; selected as one of the best SOSYM papers of the year, and presented at MODELS 2017
5. [Conference Paper] Z. Molotnikov, M. Voelter, D. Ratiu. *Automated Domain-Specific C Verification with mbeddr*. Proceedings of the 29th IEEE/ACM International Conference on Automated Software Engineering (ASE 2014), 20 pages, 2014

(these are copied from the exhaustive lists below – don't count them twice ☺)

## [FB] Full Books

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1. M. Voelter + Contributors. *DSL Engineering - Designing, Implementing and Using Domain-Specific Languages*. CreateSpace Publishing Platform (self-published), <http://dslbook.org>, 2013
2. J. Bergin, J. Eckstein, M. Voelter, M. Sipos, E. Wallingford, K. Marquardt, J. Chandler, H. Sharp, M. L. Manns. *Pedagogical Patterns: Advice For Educators*. Joseph Bergin Software Tools (self-published), 2012
3. M. Voelter, T. Stahl, S. Efftinge, A. Haase. *Modellgetriebene Softwareentwicklung - Technik, Engineering, Management*. Updated 2nd German edition, dPunkt Verlag, 2007
4. M. Voelter, T. Stahl. *Model-Driven Software Development – Technology, Engineering, Management*. Updated translation of the German MDSD book, Wiley & Sons, 2006
5. M. Voelter, T. Stahl, J. Bettin. *Modellgetriebene Softwareentwicklung - Technik, Engineering, Management*. dPunkt Verlag, 2005
6. O. Vogel, I. Arnold, A. Chughtai, E. Ihler, U. Mehlig, T. Neumann, M. Voelter, U. Zdun. *Software Architektur (1st Ed)*. Spektrum Verlag, 2003
7. M. Voelter, M. Kircher, U. Zdun. *Remoting Patterns – Patterns for enterprise, internet & embedded middleware* (part of the Pattern Series). Wiley & Sons, 2004
8. M. Voelter, A. Schmid, E. Wolff. *Server Component Patterns – Component Infrastructures Illustrated w/ EJB* (part of the Pattern Series). Wiley & Sons, 2002

## [EB] Edited Books

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1. D. Manulescu, M. Voelter, J. Noble (Eds.). *Pattern Languages of Program Design 5*. Addison-Wesley Professional, 2007

## [BC] Book Chapters

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1. B. Bryant, J.-M. Jezequel, R. Laemmel, M. Schindler, F. Steimann, J.-P. Tolvanen, A. Vallecillo, M. Voelter, *Globalized Domain Specific Language Engineering*, in B. H. C. Cheng, B. Combemale, R. B. France, J.-M. Jezequel, B. Rumpe (editors), *Globalizing Domain-Specific Languages*, LNCS 9400, 2015
2. C. Elsner, I. Groher, L. Fiege, M. Voelter. *Model-Driven Engineering Support for Product Line Engineering* in Awais Rashid, Jean-Clause Royer, Andreas Rummmler (editors), *Aspect-Oriented Model-Driven Product Lines - The AMPLE Way*, Cambridge University Press, 2011
3. M. Voelter. *Architecture As Language* in Kyo C Kang, Vijayan Sugumaran, Sooyong Park (editors), *Applied Software Product Line Engineering*, Auerbach Publishing, 2009
4. I. Groher, C. Schwanninger, M. Voelter. *Model-Driven Aspect-Oriented Product Line Engineering: An industrial Case Study* in Kyo C Kang, Vijayan Sugumaran, Sooyong Park (editors), *Applied Software Product Line Engineering*, Auerbach Publishing, 2009
5. M. Voelter, C. Salzmann, M. Kircher. *MDSD in the Context of Embedded Component Infrastructures* in Colin Atkinson, Christian Bunse, Hans-Gerhard Gross, Christian Pepper (Eds.), *Component-Based Software Development for Embedded Systems*, Springer, LNCS 3778, 2005

## **[JP] Journal Papers (Peer-Reviewed)**

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1. M. Voelter, B. Kolb, K. Birken, F. Tomassetti, P. Alff, L. Wiart, A. Wortmann, A. Nordmann, *Using Language Workbenches and Domain-Specific Languages for Safety-critical Software Development*, International Journal on Software and Systems Modeling (SOSYM), -Online-, 25 pages, <https://link.springer.com/article/10.1007/s10270-018-0679-0>, 2018
2. D. Ratiu, M. Volter, D. Pavletic, *Automated Testing of DSL Implementations - Experiences from Building mbeddr*. Software Quality Journal, 41 pages, Accepted for Publication, 2017
3. M. Voelter, B. Kolb, T. Szabo, D. Ratiu, A. van Deursen. *Lessons learned from building mbeddr – a case study in language engineering*. International Journal on Software and Systems Modeling (SOSYM), January 2017, 46 pages, <http://rdcu.be/oo3W>, 2017
4. S. Erdweg, T. v. d. Storm, M. Voelter, L. Tratt et al., *Evaluating and Comparing Language Workbenches - Existing Results and Benchmarks for the Future*, Computer Languages, Systems and Structures, Volume 44, Part A, December 2015, Pages 24–47, 2015
5. M. Voelter, B. Kolb, J. Warmer. *Projecting a Modular Future*. IEEE Software, Volume 32, Issue 5, Sept/Oct, Pages 46-52, 2015
6. M. Voelter, D. Ratiu, B. Kolb, B. Schaetz. *mbeddr - Instantiating a Language Workbench in the Embedded Systems Domain*. Journal of Automated Software Engineering, September 2013, Volume 20, Issue 3, Pages 339-390 (51 pages), 2013
7. M. Voelter. *Architecture As Language*. IEEE Software, Vol 27 Issue 2, Pages 56 – 64, 2010
8. I. Groher, M. Voelter. *Aspect-Oriented Model-Driven Software Product Line Development*. Transactions on Aspect-Oriented Software Development VI, LNCS 5560, Pages 111-152, 41 pages, 2009
9. U. Zdun, M. Voelter, M. Kircher. *Pattern-Based Design of an Asynchronous Invocation Framework for Web Services*. International Journal of Web Service Research, Volume 1, Issue 3, 21 pages, 2004

## **[CP] Conference Papers (Peer-Reviewed)**

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1. F. Steimann, M. Frenkel, M. Voelter. *Robust Projectional Editing*. The 10th International Conference on Software Language Engineering (SLE 2017), 12 pages, 2017
2. M. Voelter, T. Szabo, S. Lisson, B. Kolb, S. Erdweg, T. Berger. *Efficient Development of Consistent Projectional Editors using Grammar Cells*. The 9th International Conference on Software Language Engineering (SLE 2016), 13 pages, 2016 (Distinguished Paper Nominee)
3. T. Szabo, S. Erdweg, M. Voelter. *Real-Time Feedback through Incremental Program Analysis*. Proceedings of the 31st IEEE/ACM International Conference on Automated Software Engineering (ASE 2016), 11 pages, 2016
4. E. Khalilov, J. Ross, M. Antkiewicz, M. Voelter, K. Czarnecki. *Modeling and Optimizing Automotive Electric/Electronic (E/E) Architectures: Towards Making Clafer Accessible to Practitioners*. ISoLA 2016
5. T. Szabo, S. Alperovich, M. Voelter, S. Erdweg. *An Extensible Framework for Variable-Precision Data-flow Analyses in MPS (Tool Paper)*. Proceedings of the 31st IEEE/ACM

- International Conference on Automated Software Engineering (ASE 2016), 6 pages, 2016
6. T. Berger, M. Voelter, H. P. Jensen, T. Dangprasert, J. Siegmund. *Efficiency of Projectional Editing: A Survey, an Experiment, and Lessons Learned*. FSE 2016, 12 pages, 2016
  7. M. Voelter, A. van Deursen, B. Kolb, S. Eberle. *Using C Language Extensions for Developing Embedded Software: A Case Study*. OOPSLA 2015, 20 pages, 2015
  8. D. Pavletic, M. Voelter, S. A. Raza, B. Kolb, T. Kehrer. *Extensible Debuggers for Extensible Languages*. Proc. of Ada-Europe 2015, 14 pages, 2015
  9. Z. Molotnikov, M. Voelter, D. Ratiu. *Automated Domain-Specific C Verification with mbeddr*. Proceedings of the 29th IEEE/ACM International Conference on Automated Software Engineering (ASE 2014), 20 pages, 2014
  10. M. Voelter, J. Siegmund, T. Berger, B. Kolb. *Towards User-Friendly Projectional Editors*. Proc. of the 7th Intl. Conf. on Software Language Engineering (SLE 2014), 20 pages, 2014
  11. F. Kneer, E. Kamsties, M. Voelter. *Feedback-aware Requirements Documents for Smart Devices*. Proc. of the 20th International Working Conference on Requirements Engineering: Foundation for Software Quality (RefSQ), 16 pages, 2014
  12. T. v. d. Storm, S. Erdweg, M. Voelter + 19 tool developers. *The State of the Art in Language Workbenches - Conclusions from the Language Workbench Competition*, Proc. of the the 7th International Conference on Software Language Engineering (SLE) 2013, LNCS 8225, pp 197-217, 20 pages, 2013
  13. V. Pech, A. Shatalin, M. Voelter. *JetBrains MPS as a Tool for Extending Java*. Proceedings of the 10th International Conference on Principles and Practices of Programming on the Java Platform: Virtual Machines, Languages, and Tools (PPPJ). ACM, pp 165-168, 4 pages, 2013
  14. D. Ratiu, M. Voelter, B. Kolb, B. Schaez. *Using Language Engineering to Lift Languages and Analyses at the Domain Level*. Proc. of the 5th NASA Formal Methods Symposium (NFM), LNCS 7871, pp 465-471, 7 pages, 2013
  15. M. Voelter, D. Ratiu, B. Kolb, B. Schaez. *mbeddr: an Extensible C-based Programming Language and IDE for Embedded Systems*. Proc. of the 3rd annual conference on Systems, programming, and applications: software for humanity (SPLASH), ACM, pp 121-140, 20 pages, 2013
  16. L. Bettini, D. Stoll, M. Voelter, S. Colameo. *Approaches and Tools for Implementing Type Systems in Xtext*. Proc. of the 6th International Conference on Software Language Engineering (SLE) 2012, LNCS7745, pp 392-412, 20 pages, 2013
  17. M. Voelter, E. Visser. *Product-Line Engineering using Domain-Specific Languages*. Proc. of the 15th Software Product Line Conference (SPLC) 2011, IEEE, pp 70-79, 2011
  18. M. Voelter. *Language and IDE Modularization and Composition with MPS*. International Summer School on Generative and Transformational Techniques in Software Engineering, GTTSE 2011, LNCS 7680, pp 383-430, 47 pages, 2013
  19. M. Voelter. *Embedded Software Development with Projectional Language Workbenches*. Proc. of the 13th International Conference on Model Driven Engineering Languages and Systems (MODELS) 2010, LNCS 6395, pp 32-46, 15 pages, 2010
  20. M. Voelter, I. Groher. *Product-Line Implementation using Aspect-Oriented and Model-Driven Software Development*. Proc. of the 11th Software Product Line Conference (SPLC) 2007, IEEE, pp 70-79, 10 pages, 2007



## **[WP] Workshop Papers (Peer-Reviewed)**

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1. F. Keller, M. Voelter, A. van Hoorn, K. Birken. *Leveraging Palladio for Performance Awareness in the IETS3 Integrated Specification Environment*, 7th Symposium on Software Performance, 2016
2. D. Ratiu, M. Voelter, *Automated Testing of DSL Implementations*, 11th IEEE/ACM International Workshop on Automation of Software Test (AST 2016) at ICSE 2016, 2016
3. M. Voelter, Z. Molotnikov, B. Kolb. *Towards Improving Software Security using Language Engineering and mbeddr C*, 15<sup>th</sup> Workshop on Domain Specific Modeling at SPLASH 2015, 2015
4. M. Voelter, S. Lisson. *Supporting Diverse Notations with MPS' Projectional Editor*, 2nd International Workshop on The Globalization of Modeling Languages, MODELS 2014
5. M. Voelter, *Preliminary Experience of using mbeddr for Developing Embedded Software*. Workshop on Model-Based Development of Embedded Systems (MBEES) 2014, Dagstuhl
6. M. Voelter, D. Ratiu and F. Tomassetti. *Requirements as First-Class Citizens: Integrating Requirements with Implementation Artifacts*. 6th International Workshop on Model-Based Architecting/Construction of Embedded Systems (ACES-MB) 2013, 10 pages, MODELS 2013
7. M. Voelter. *Integrating Prose as a First-Class Citizen with Models and Code*. 7th International Workshop on Multi-Paradigm Modeling (MPM'13), 10 pages, MODELS 2013
8. D. Pavletic, A. S. Raza, M. Voelter, B. Kolb, T. Kehrer. *Extensible Debuggers for Extensible Languages*. GI/ACM Workshop on Software Reengineering, 2 pages, 2013
9. F. Tomassetti, A. Vetró, M. Torchiano, M. Voelter, B. Kolb. *A Model-Based Approach to Language Integration*. 5th International Workshop on Modeling in Software Engineering (MiSE) 2013, 6 pages, ICSE 2013
10. D. Ratiu, M. Voelter, B. Schaetz, Z. Molotnikov. *Implementing Modular Domain Specific Languages and Analyses*. Proceedings of the Workshop on Model-Driven Engineering, Verification and Validation (MoDeVVA) 2012. pp 35-40, 6 pages, MODELS 2012 [Best Paper Award]
11. D. Ratiu, M. Voelter, B. Schaetz, B. Kolb. *Language Engineering as an Enabler for Incrementally-Defined Formal Analyses*. Workshop on Formal Methods in Software Engineering: Rigorous and Agile Approaches (FORMSERA 2012), pp 9-15, 6 pages, ICSE 2012
12. M. Voelter. *Implementing Feature Variability for Models and Code with Projectional Language Workbenches*. 2nd International Workshop on Feature-Oriented Software Development (FOSD) 2010, pp 41 – 48, 8 pages, 2010
13. M. Voelter, B. Merkle. *Domain Specific - a Binary Decision?* 10th Workshop on Domain-Specific Modeling (DSM 2010), 6 pages, OOPSLA 2010
14. M. Voelter. *A Family of Languages for Architecture Description*. 8th Workshop on Domain-Specific Modeling (DSM) 2008, 8 pages, OOPSLA 2008
15. I. Groher, M. Voelter. *Using Aspects to Model Product Line Variability*. Workshop on Early Aspects: Aspect-Oriented Requirements and Architecture for PLE, SPLC 2008
16. M. Voelter, I. Groher. *Handling Variability in Model Transformations and Generators*. 7th Workshop on Domain-Specific Modeling (DSM) 2010, 12 pages, OOPSLA 2007

17. I. Groher, M. Voelter. *Expressing Feature-Based Variability in Structural Models*. Workshop on Managing Variability for Software Product Lines, 6 pages, SPLC 2007
18. I. Groher, M. Voelter. *XWeave, Models and Aspects in Concert*. 10th Workshop on Aspect-oriented modeling, 6 pages, AOSD 2007
19. M. Voelter. *Jenerator – Generative Programming for Java*. Workshop on Generative Programming, OOPSLA 2001

## **[PP] Pattern Papers (Workshopped)**

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1. M. Voelter. *Variability Patterns*. 14th European Conference on Pattern Languages of Programs, 2009
2. M. Voelter. *Software Architecture Patterns*. 11th European Conference on Pattern Languages of Programs, 2006
3. M. Voelter. *Models and Aspects*. 10th European Conference on Pattern Languages of Programs, 2005
4. M. Voelter, J. Bettin. *Patterns for Model-Driven Development*. 9th European Conference on Pattern Languages of Programs, 2004
5. M. Kircher, M. Voelter, C. Schwanninger, K. Jank. *Broker Revisited*. 9th European Conference on Pattern Languages of Programs, 2004
6. M. Voelter, M. Kircher. *Command Revisited*. 9th European Conference on Pattern Languages of Programs, 2004
7. M. Voelter, U. Zdun, M. Kircher, M. Englbrecht. *Patterns for Asynchronous Invocations in Distributed Object Frameworks*. 8th European Conference on Pattern Languages of Programs, 2003
8. M. Voelter. *A Collection of Patterns for Program Generation*. 8th European Conference on Pattern Languages of Programs, 2003
9. M. Voelter. *Object-Oriented Remoting - A Pattern Language*. First Scandinavian Conference on Pattern Languages of Programs, 2002
10. M. Voelter, A. Schmid, E. Wolff. *Building EJB Applications - A Collection of Patterns*. 9th Conference on Pattern Language of Programs, 2002
11. M. Voelter. *Hope, Belief and Wizardry - Three different Perspectives on Project Management*. 7th European Conference on Pattern Languages of Programs, 2002
12. J. Eckstein, K. Marquardt, M. Voelter. *Patterns for Experiential Learning*. 6th European Conference on Pattern Languages of Programs, 2001
13. M. Voelter. *Server-Side Components - A Pattern Language*. 6th European Conference on Pattern Languages of Programs, 2001
14. M. Voelter, A. Fricke. *SEMINARS - A Pedagogical Pattern Language on how to teach seminars*. 5th European Conference on Pattern Languages of Programs, 2000
15. M. Voelter. *The Metacommand Pattern*. 5th European Conference on Pattern Languages of Programs, 2000

## [MA] Magazine Articles

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The list below is just a selection. I (co-)authored **over 75 articles** in various magazines and websites, including: iX, Java Magazin, Java Spektrum, Object Spektrum, Wiley Software Focus, sw-development, Computerwoche, Eclipse Magazin, Datenbank-Spektrum, TheServerSide, InfoQ, Heise Developer, DotNetPro, IEEE Software, Cutter Executive Update, Embedded Control Europe. The full list is at <http://voelter.de/publications/#Articles>

1. M. Voelter. *From Programming to Modeling and Back Again*. IEEE Software, Vol 28, Issue 6, pp 20 – 25, 2011
2. J. D. Mc Gregor, M. Voelter. *The Model Craftsman*. Cutter Executive Update. 2010
3. M. Voelter. *MD\* Best Practices*. Journal of Object Technology, Vol. 8, No. 6, September 2009, 23 pages, 2009
4. M. Kircher, M. Voelter. *Guest Editorial on Software Patterns*. IEEE Software, 2007
5. U. Zdun, M. Voelter, M. Kircher. *Remoting Patterns - A Systematic Approach for Design Reuse of Distributed Object Middleware Solutions*. IEEE Internet, November 2004, Special Issue on Middleware, pp 60 – 68, 2004
6. M. Voelter. *A taxonomy for components*. Journal of Object Technology, Vol. 2, No. 4, July-August 2003, 7 pages, 2003
7. J. Eckstein, M.-L. Manns, M. Voelter. *Pedagogical patterns - capturing best practices in teaching object technology*. Wiley Software Focus, 2002

## [KN] Keynotes

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1. *Lessons learned about language engineering from the development of mbeddr*, ITSLE (Industry Track for Software Language Engineering), 2016
2. *The State of the Art in Language Workbenches*, 6th International Workshop on Domain-Specific Languages and models for Robotic systems (DSLRob-15), IROS 2015
3. *Introducing Language-Oriented Business Applications*, JAX London 2014
4. *Language Workbenches: Opportunities and Challenges for Verification and Validation*, MoDeVVA 2014 Workshop at MODELS 2014
5. *Language Shapes (Architectural) Thought*, European Conference on Software Architecture (ECSA), 2014
6. *Architecting Architecture DSLs*, International Workshop on DSL Architecting & DSL-based Architectures (DADA'14), ECSA 2014
7. *Generic Tools, Specific Languages*. Software Development Automation Conference (SDA) 2013, Amsterdam
8. *Domain-Specific Language Design - A framework for building good DSLs*, CodeGeneration Conference (CG) 2012, Cambridge
9. *Trends in Programming Languages*, International Conference on Accelerator Physics and Large Experimental Physics Control Systems (ICALEPCS) 2011, Grenoble
10. *Thoughts on DSLs und PLE*, MAPLE/Scale Workshop, SPLC 2011, München

11. *The state of the art in (external) DSLs*. Workshop on Generative Techniques WGT 2011 Workshop, Saarbrücken
12. *Language Workbenches als Basis fuer integrierte Sprachentwicklung*. 3. Workshop Methodische Entwicklung von Modellierungswerkzeugen, Informatik 2011, Berlin
13. *DSLs and Product Lines*, Fifth International Workshop on Variability Modelling of Software-intensive Systems (VAMOS) 2011, Namur
14. *Language Workbenches and Software Product Lines*, Practical Product Lines Conference, (PPL) 2009, Amsterdam
15. *MDD: The Good, The Bad and The Ugly* (together with S. Kelly), CodeGeneration Conference (CG) 2009, Cambridge

## **[IT] Invited Talks, Summer Schools**

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1. M. Voelter, *How Domains Shape Languages*. SPLASH 2016, Industry/Inspiring/Invited Track, Amsterdam, 2016
2. M. Voelter, *KernelF - Designing an extensible and embeddable functional language*, IFIP WG 2.16 Meeting, Lausanne, 2016
3. M. Voelter, *Language-Oriented Business Applications - Helping End Users become Programmers*, SPLASH-I 2015, 2015
4. M. Voelter, *Die Rolle von Modellen im Embedded Software Engineering*, Modeling of Embedded Systems Conference, 2015
5. M. Voelter, *Thoughts on the Collaboration between Software Engineers and Domain Experts* (Dinner Speech), European Conference of Software Engineering Education 2014, 2014
6. M. Voelter, *mbeddr's Support for Variability - features and challenges*, FOSD Workshop, 2014
7. M. Voelter, *DSL Design*, 3rd International Summer School on Domain-Specific Modeling – Theory and Practice, Lisbon, 2012
8. M. Voelter, *mbeddr Language Design*, IFIP WG 2.16 Meeting, Austin, 2012
9. M. Voelter, *Modeling and Programming - isn't it all the same?* CHOOSE Forum 2012
10. M. Voelter, *Models, DSLs and Code Generation*, CERN Computing Seminar, 2012
11. M. Voelter, *Trends in Programming Languages*, ICALEPCS, 2011
12. M. Voelter, *Language and IDE Development, Modularization and Composition with MPS*, GTTSE, 2011
13. M. Voelter, *Textual DSLs in Practice*, Modellierung, 2011
14. M. Voelter, *Thoughts on DSLs und PLE*, MAPLE/SCALE Workshop, 2011
15. M. Voelter, *Domain-Specific Languages for Requirements*, RefSQ Industry Track, 2011
16. M. Voelter, *Practical textual DSLs with Xtext and MPS*, Workshop on OCL and Textual Modelling, 2010
17. M. Voelter, *DSLs - Examples, Tools, Practices*. 3rd Reuse In Software Engineering (RISE) International Summer School, 2010, Salvador da Bahia, 2010

## [SW] Seminars and Workshops

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1. *Thoughts on DSLs for business users*. Lorentz Workshop on Normware, 2016, Leiden
2. *Verifying Application Requirements at the C Code Level* (with D. Ratiu and Zaur Molotnikov), Dagstuhl Seminar 14062, The Pacemaker Challenge: Developing Certifiable Medical Devices, 2014
3. *Thoughts on DSLs, Applications and their Users*, Lorentz Workshop on Language Interaction Design, 2013, Leiden
4. *Generic Tools, Specific Languages*. Dagstuhl Seminar 13182, Meta-Modeling Model-Based Engineering Tools, 2013, Dagstuhl
5. *Requirements as First-Class Citizens: Integrating Requirements closely with Implementation Artifacts*. Workshop Model-Based Development of Embedded Systems (MBEES) 2013, Dagstuhl
6. *mbeddr Language Design*. IFIP WG 2.16 on Language Design, Austin, 2012
7. *Towards an Extensible C for Embedded Programming*. Workshop Model-Based Development of Embedded Systems (MBEES) 2012, Dagstuhl
8. *A textual domain specific language for AUTOSAR*, with A. Graf, Workshop Model-Based Development of Embedded Systems (MBEES) 2009, Dagstuhl

## [CT] Conference Talks or Tutorials

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I (co-)presented **over 200 talks and tutorials** at national and international conferences, including OOP, JAX, EclipseCon, Öredev, JA00, ECOOP, MODELS, OOPSLA/SPLASH, ECMDA, AOSD, GPCE, TOOLS, ICSE, QCon, SPLC, SE, Embedded Software Kongress, CodeGeneration. The following is a selection; the full list is <http://voelter.de/conferences/>

1. M. Voelter, *Complete Isolation of Business Logic using DSLs*, The Architecture Gathering, Munich, 2016
2. M. Voelter, *Building mbeddr – a Language Engineering Experiment*. GPCE 2014 Tech Talk
3. M. Voelter. *The Art of Building Tools – A Language Engineering Perspective*. Öredev 2013
4. M. Voelter. *The State-of-the-Art in Language Workbenches*. OOP 2013
5. M. Voelter, D. Ratiu. *Language Workbenches, Embedded Software and Formal Verification*, MODELS 2012
6. M. Voelter *Domain-Specific Language Design*. ICSE 2012
7. M. Voelter. *Testen von DSLs*. OOP 2012
8. M. Voelter. *DSLs for Product Lines - Approaches, Tools, Experiences*. SPLC 2011
9. M. Voelter. *Type Systems for DSLs*. Code Generation 2011
10. M. Voelter, E. Visser. *Language Composition and Extension with Language Workbenches*. SPLASH 2010
11. M. Voelter. *Language Definition and Extension with MPS*. GPCE 2010
12. M. Voelter. *Erweiterbare Programmiersprachen fuer die Embedded-Entwicklung*. ESE Kongress 2010

13. M. Voelter, A. Haase, H. Seeberger. *Durchstarten mit Scala*. JAX 2010
14. M. Voelter, P. Friese. *Software Engineering mit Domänenspezifischen Sprachen und Language Workbenches*, SE 2010
15. M. Voelter. *Textual DSLs and Code Generation with Eclipse Tools*. Microsoft DSL Devcon, 2010
16. M. Voelter. *Architecture As Language*. OOPSLA 2008
17. M. Voelter, B. Kolb. *An introduction to Model-driven-development using Eclipse Tools*, EclipseCon 2008
18. M. Voelter. *Writing Adaptable Software - Mechanisms for Implementing Variability in Code & Models*. JAOO 2007
19. M. Voelter, Doug Schmidt. *Model-Driven Development of Distributed Systems*. OOPSLA 2006
20. M. Voelter. *Model-Driven Development of Distributed Systems*. ICALEPCS 2005
21. M. Voelter. *The Role of Patterns in Modern Software Engineering*. JAOO 2005
22. M. Voelter. *Source Code Generation - Concepts, Techniques and Tools*. ECOOP 2003

## **[MM] Multimedia**

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1. [Conf. Keynote Video] *Language-Oriented Business Applications*, Recorded at JAX London, 2014  
<http://jaxenter.com/turn-business-users-software-programmers-117248.html>
2. [Conf. Talk Video] *The Art of Building Tools – A Language-Engineering Perspective*, Recorded at Craft Conference, 2014  
<http://www.ustream.tv/recorded/46664399>
3. [Audio Interview] *Language Design and Domain Specific Languages* Software Engineering Radio, Episode 200, Jan. 2014  
<http://www.se-radio.net/2014/01/episode-200-markus-volter-on-language-design-and-domain-specific-languages/>
4. [Audio Interview] *mbeddr – Ein neuer Ansatz für moderne Softwareentwicklung* Zukunftsarchitekten-Podcast, Jul. 2013  
<http://zukunftsarchitekten-podcast.de/2013/07/za056-mbeddr-ein-neuer-ansatz-fur-moderne-softwareentwicklung/>
5. [Conf. Talk Video] *The Art of Building Tools – A Language-Engineering Perspective* Recorded at Öredev 2013  
<http://oredev.org/2013/wed-fri-conference/the-art-of-building-tools--a-language-engineering-perspective>
6. [Conf. Talk Video] *Working with Multiple Languages: Why and How*. Recorded at Code Generation 2013.  
<http://www.infoq.com/presentations/tutorial-polyglotism>
7. [Conf. Talk Video] *DSL Design - A Framework for Building Good DSLs*. Recorded at Code Generation 2012.  
<http://www.infoq.com/presentations/DSL-Design>
8. [Conf. Talk Video] *mbeddr C: An Extensible Version of the C Programming Language for Embedded Programming*.

Recorded at Code Generation 2012.

<http://www.infoq.com/presentations/mbeddr-C>

9. [Video Interview] *DSLs, Modeling, MPS, mbeddr*

Recorded at Code Generation 2012.

<http://www.infoq.com/interviews/voelter-mps-modeling-dsl>

10. [Conf. Talk Video] *Type Systems for DSLs*

Recorded at Code Generation 2011.

<http://www.infoq.com/presentations/Type-Systems-for-DSLs>

11. [Video Interview] *Software Architecture Documentation*

Recorded at OOPSLA 2007

<http://www.infoq.com/interviews/MarkusVoelteraboutSoftwareArchitectureDocumentation>

## Steering Committee Memberships

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SLE Steering Committee, 2015 - now

## Conference/Programme Chairs

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SLE 2015 Program Co-Chair

MODELS 2008, Experience Track co-chair

GPCE 2003, Demonstrations chair

## Conference Program Committees

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GPCE 2017

FSE/ESEC Industry Track 2017

GTTSE 2015

GPCE 2016

SPLC 2016 Industry Track

ICSR 2016

MODELS 2015

ICSR 2015

SPLC 2014

MoDELS 2014, Applications Track

Industry Track, SLE 2013

ICSR 2013

Code Generation, 2009 - 2014

MoDELS 2013, Applications Track

ModelsWard 2013, Conference

ECMFA 2013, Applications Track

SPLC 2012, Tool and Demos Track

ECMFA 2011, Industry Track

Onward 2011

SPLC 2011 Industry Track

Industry Track SLE 2011

ECMFA 2010, Application Track

OOPSLA/SPLASH 2010, Onward Essays

MODELS 2010, Applications Track

GPCE 2009 Practice Track

MODELS 2009, Empirical Results

ICSE 2009 Practice Track

MODELS 2008

OOPSLA 2008 Tutorials

OOPSLA 2008 Demos/Posters

EuroPLoP 2002 - 2007

Models 2007

OOPSLA 2006 Posters

OOPSLA 2003 special track on  
Domain-Driven Development

OOPSLA 2001, educator's symposium

## Organized Workshops

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Language Workbench Challenge @ SLE  
2016

MD2P2 2014 - Model-Driven Development  
Processes and Practices, MoDELS  
2014

Produktlinien im Kontext (with A. Birk,  
K. Schmid), SE 2010

Model-driven Approaches in Software  
Product Line Engineering (with G.  
Botterweck, I. Groher, A. Polzer, C.  
Schwanninger, S. Thiel), SPLC 2009

Produkt-Variabilität im gesamten Le-  
benszyklus (with K. Marquardt, D.  
Schütz), SE 2009

MDD-TIF'07 Model-Driven Development  
Tool Implementers Forum (with S. Kelly,  
J. Gray), TOOLS 2007

Best Practices for Applying Aspect-  
Oriented Software Development (with C.  
Schwanninger, D. Beuche, I. Groher),  
AOSD 2007

Models and Aspects (with C. Schwan-  
ninger, I. Groher, A. Haase, A. Jackson),  
ECOOP 06

Best Practices in Applying Aspect-  
Oriented Software Development (with C.  
Schwanninger, D. Beuche, I. Groher, A.  
Haase), AOSD 06

Managing Variabilities consistently in  
Design and Code (with C. Schwanninger,  
D. Beuche, K. Czarnecki, M. Mezini, R.  
Burgstaller), OOPSLA 2005

First International Workshop on Software  
Factories (with J. Greenfield, S. Cook, K.  
Czarnecki, J. Gray, M. Stal, G. Karsai, D.  
Batory, B. Henderson-Sellers, C. Gonza-  
lez-Perez), OOPSLA 2005

Best Practices for Model Driven Software  
Development (with J. Bettin, G. van Emde  
Boas, J. Bezivin, W. Cook), OOPSLA 2005

First Workshop on Models and Aspects -  
Handling Crosscutting Concerns in

MDSD (with C. Schwanninger, I. Groher),  
ECOOP 2005

Best Practices for Model-Driven Software  
Development (with J. Bettin, G. van Emde  
Boas, A. Agrawal, J. Bezivin), OOPSLA  
2004

Managing Variabilities consistently in  
Design and Code (with C. Schwanninger,  
D. Beuche, K. Czarnecki, M. Mezini),  
OOPSLA 2004

Evolution and reuse of language specifica-  
tions for DSLs (with T. Cleenewerck, K.  
Czarnecki, J. Striegnitz), ECOOP 2004

Reuse in Constrained Environments  
(with M. Kircher, U. Zdun, C. Schwan-  
ninger, A. Schmid) OOPSLA 2003

Patterns for Component Composition and  
Adaptation (with U. Zdun), EuroPLoP  
2003

Model-Driven and Agile Development  
(with K. Czarnecki, F. Westphal, H. We-  
gener, J. Yoder), ECOOP 2003

Extendible Architectures Best Practices  
(with K. Marquardt), OT 2003

Peer To Peer Patterns (with E.  
Chtcherbina), EuroPLoP 2002

Generative Programming (with K. Czar-  
necki), ECOOP 2002

Bringing Structure to Experience With  
Agile Development (with H. Wegener, J.  
Coldewey), XP2002

Small Components (with M. Kircher, N.  
Wang), OT 2002

Agile Processes in the Large (with J. Eck-  
stein, N. Josuttis), OT 2002

Workshop on testing EJB systems (with  
O. Vogel), OOPSLA 2001



Merging pattern languages (with J.

Bergin), EuroPLoP 2001 EuroPLoP 2001

## **Workshop Program Committees**

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GPCE 2017	Academic Software Development Tools, ASE 2010
GEMOC 2017	
GEMOC 2016	Model-Driven Approaches in PLE, SPLC 2010
DSLDI 2016	Model-Driven Product Line Engineering, ECMFA 2010
LWC 2016	
GEMOC Workshop MODELS'15	From code centric to model centric - Evaluating the effectiveness of MDD, ECMFA 2010
DSL Design and Implementation, SPLASH 2014	Domain-Specific Modeling, OOPSLA 2009
Globalization of Modeling Languages, Models 2014	Aspect Oriented Modeling Workshop, AOSD 2009
2nd Workshop on View-Based, Aspect-Oriented and Orthographic Software Modelling, STAF 2014	Domain Specific Modeling 2008, OOPSLA 2008
Open Source Software for MDE MODELS'14	Early Aspects @ SPLC, SPLC 2008
Domain-Specific Modeling, SPLASH 2013	Domain Specific Modeling 2007, OOPSLA 2007
Model-Driven Approaches in Product Line Engineering, SPLC 2012	Aspect Oriented Modeling, MODELS 2007
Product Line Approaches in Software Engineering, ICSE 2011	Aspect-Oriented Modeling, ECMDA 2007
Model-based Engineering for Real-Time Embedded Systems, MoBE-RTES 2011	MDSd heute, SE 2007
Domain Specific Modeling, SPLASH 2012	Aspect-Oriented Modeling, AOSD 2007
Domain Specific Modeling, SPLASH 2010	Domain-Specific Modeling, OOPSLA 2006
Product Line Approaches in Software Engineering, ICSE 2010	Aspect-Oriented Product Line Engineering, GPCE 2006
Automated Configuration and Tailoring of Applications, ASE 2010	

## **Research Projects/Grants**

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IETS3 (2016 – ongoing)

The BMBF KMU-Innovativ project *Integrated Specification Environments for Specifying Technical Systems* is 709.000 EUR in total volume, and comprises ca. 4 people over 2 years. Bernhard Schätz and Vincent Aravantinos of Fortiss took care of the administrative aspects.

In IETS3, itemis, fortiss, Diehl and ZF will develop an IDE-like system for specification of complex technical systems. The project will rely on the experience gained in LWES and mbeddr's evolution since then, and will further the state of the art in requirements engineering and language engineering.

### LWES (2011-13)

The BMBF KMU-Innovativ project *Language Workbenches for Embedded Systems* (Fkz. 01 IS 11 014 A) was based on my ideas. I have been involved in the grant proposal, and acted as PI for the project. The project was 765.000 EUR in total volume, and comprised ca. 5 people over 2 years. Bernhard Schätz and Daniel Ratiu of Fortiss took care of the administrative aspects.

As part of LWES, itemis, fortiss and BMW Car IT developed mbeddr, which has since been open sourced and migrated to Eclipse. mbeddr is the subject of several of my publications as a major ingredient of my PhD thesis. mbeddr also serves as the basis for a commercial tool developed with Siemens PL (LMS).

### AMPLE (2006-07)

I have been working as a researcher for Siemens CT in the AMPLE project (<http://ample-project.net>), together with Christa Schwanninger and Iris Groher. I was working on integrating product line engineering with model-driven development and DSLs. Based on the openArchitectureWare platform, I have built tools to integrate models with feature management tools (such as pure::variants) to express variants of models. I have also built several model weavers, supporting variability via aspect weaving on models.

## **Community Activities**

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- Co-Initiator of the Language Workbench Challenge (<http://languageworkbenches.net>)
- Co-founder and long time (now ex-) editor and interviewer for Software Engineering Radio podcast (<http://se-radio.net>).
- Reviewer for Journal of Software and Systems Modeling (SoSyM)
- Reviewer for IEEE Software
- IEEE Software Special Issue on Software Patterns Guest Editor
- Former IEEE Software Industry Advisory Board member

## **Memberships**

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IFIP Working Group 2.16 on Programming Language Design  
Association for Computing Machinery  
Hillside Europe

## Teaching Experience

### [FC] Full Courses

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Universität Stuttgart, Sommersemester 2016, *Language Engineering*, 4 SWS  
(contact: Prof. Dr. Stefan Wagner), one-week continuous course

Universität Stuttgart, Sommersemester 2015, *Language Engineering*, 4 SWS  
(contact: Prof. Dr. Stefan Wagner)

Nantes University, April 2010, *MDD Best Practices*, 2 SWS  
(contact: Prof. Dr. Jean Bezin)

University of Leipzig, Wintersemester 2006, *Model-Driven Development*, 4 SWS  
(contact: Prof. Ulrich Eisenecker)

Fachhochschule Ulm, Sommersemester 2003, *Software-Engineering*, 4 SWS  
(contact: Prof. Dr. Stefan Traub)

Fachhochschule Ulm, Sommersemester 2002, *Software-Architektur*, 4 SWS  
(contact: Prof. Dr. Stefan Traub)

### [GL] Guest Lectures

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Chalmers University. *Language Composition: Why and How?*  
Prof. Dr. Thorsten Berger, 2016

University of Stuttgart. *System Specification with DSLs.*  
Vertr. Prof. Dr. André van Hoorn, 2016

University of Bayreuth. *Language Development with JetBrains MPS.*  
Prof. Dr. Ing. Stefan Jablonski / Lars Ackermann, 2015

IT University of Copenhagen. *Language Workbenches and JetBrains MPS.*  
Prof. Dr. Andrzej Wąsowski, 2015

University of Stuttgart. *Modelle und Softwarearchitektur: Warum und Wie?.*  
Prof. Dr. Lars Grunske, 2015

University of Karlsruhe/KIT. *Language Workbenches as the basis for MD\*.*  
Prof. Dr. Ralf Reussner / Dr. Lucia Happe, 2015

University of Leipzig. *Language Engineering with MPS.*  
Prof. Dr. Ulrich Eisenecker, 2014

University of Budapest. *Language Engineering with MPS.*  
Dr. Istvan Rath, 2014

IT University of Copenhagen. *Language Engineering with MPS.*  
Prof. Dr. Andrzej Wąsowski, 2014

University of Stuttgart. *Modelle und Softwarearchitektur: Warum und Wie?*  
Prof. Dr. Lars Grunske, 2014

RWTH Aachen University. *mbeddr as a Case Study of Language Engineering with MPS.*  
Prof. Dr. Bernhard Rumpe, 2013

University of Stuttgart. *Language Engineering and Formal Verification.*  
Prof. Dr. Stefan Wagner, 2013

University of Paderborn. *DSLs with MPS.*  
Prof. Dr. Steffen Becker, 2012

University of Stuttgart. *Embedded Development with mbeddr.*  
Prof. Dr. Stefan Wagner, 2012.

HTW Konstanz, *DSLs with MPS.*  
Prof. Dr. Marko Boger, 2011

Delft Technical University. *mbeddr.*  
Prof. Dr. Eelco Visser, 2011

University of Amsterdam. *MPS.*  
Prof. Dr. Paul Klint, 2011

University of Marburg. *MDSO and textual DSLs.*  
Prof. Dr. Gabi Taentzer, 2010

University of Leipzig. *DSLs.*  
Prof. Dr. Ulrich Eisenecker, 2010

University of Stuttgart, *Architecture DSLs.*  
Prof. Dr. Jochen Ludewig, 2009

University of Darmstadt, *MDSO Best Practices.*  
Prof. Dr. Mira Mezini, 2007

## **[SU] Student Supervision**

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Fabian Keller, *Introducing Performance Awareness in an Integrated Specification Environment*, Master Thesis, Universität Stuttgart, co-supervised with André van Hoorn

Tamas Szabo. *Title tbd.* PhD Thesis, TU Darmstadt/Delft, co-supervised with Prof. Dr. Sebastian Erdweg and Prof. Dr. Mira Mezini/Prof. Dr. Eelco Visser, 2015 - ongoing

Bastian Gorholt. *Parallel programming for embedded software with mbeddr.* Master Thesis, TU Darmstadt, Studiengang Informatik, co-supervised with Dr. Sebastian Erdweg and Prof. Dr. Mira Mezini, 2014

Malte Jannasch. *Entwicklung von Datenflussanalysen für mbeddr C.* Master Thesis, Hochschule Reutlingen, Fakultät Informatik, Studiengang, co-supervised with Prof. Dr. Ing. Peter Hertkorn und Prof. Dr.-Ing. habil. Natividad Martínez Madrid, 2013

Domenik Paveltic. *A Debugging Framework for Extensible Domain-Specific Languages.* Master Thesis, Media University Stuttgart, Computer Science and Media, co-supervised with Prof. Walter Kriha and Timo Kehrer, 2012

## **[TR] Industry Trainings**

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My first training was on Software Design Patterns for Mathema in 2000. Since then I have run many multi-day industry trainings internal to companies, as well as publicly (mostly for SIGS Datacom, Germany, as well as Sioux Embedded Systems, The Netherlands).

Topics focused mostly on model-driven development, code generation and DSLs. All my trainings have a strong practical focus, with participants working on code assignments on their own laptops with tools such as openArchitectureWare, Eclipse Xtext and JetBrains MPS. Group sizes reached from 3 to 20.

## **[PC] Podcasting**

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Podcasting is a wonderful educational vehicle: the dialog between two people, one asking intelligent questions, and the other one explaining expertly, is vastly underrated as a means of explaining complex topics.

In 2006 I founded Software Engineering Radio (<http://se-radio.net>), one of the premier podcasts on software engineering. Some episodes have up to 50,000 downloads. Of the 180 episodes available at the time SE Radio was handed over to IEEE, I had acted as the interviewer for ca. 120. In addition to being an educational resource for the listeners, it has also helped me better understand many aspects of software engineering. In 2012 I handed SE Radio over to IEEE Software, because the current editing and interviewing team was running out of steam.

In 2008 I founded the omega tau podcast (<http://omegataupodcast.net>) which covers a wide range of topics from science and engineering. I had to give up SE Radio to be able to focus on omega tau. Together with my partner Nora Ludewig, we have since published over 180 episodes on topics such as particle physics, astronomy, biochemistry, space and aviation.

# Industry Experience

## Innovation Projects

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**Eclipse Rich Clients:** Long before Eclipse RCP became a buzzword and a reality, I have been building a non-trivial Eclipse-based business application for ESG and DaimlerChrysler (as part of the Daisy project).

**Generative Component Infrastructures:** For a long time I have been working on generative component infrastructures for embedded systems. Among other things, I had written the Small Components paper. One day, BMW Car IT called and asked whether I could help implementing a proof-of-concept for the AUTOSAR standard. As it turns out, AUTOSAR uses exactly the same approach - generative component infrastructures - to realize in-vehicle component middleware. For the next year, I led the generative part of the AUTOSAR proof-of-concept. The mbeddr project takes the idea further by integrating C code and components completely.

**Generating Graphical Editors:** As part of the AUTOSAR proof-of-concept development project we have built an integrated IDE for AUTOSAR development based on Eclipse. A part of this IDE was a set of graphical, GEF based editors. After initially developing these editors manually, we started generating these editors from the domain metamodel plus specific editor description models. This is the same approach that has since been taken by the Eclipse GMF and Spray projects.

**Textual DSLs:** Textual DSLs are becoming more and more mainstream now; a major reason for this are tools like Xtext. Although I was not directly involved in the implementation of Xtext (as part of oAW, or now as part of Eclipse modeling), I have used it in real-world projects since the early days, and spent a lot of "conference talk time" explaining why textual DSLs are a good idea. In that sense, I did play a part in making textual DSLs more mainstream in the context of modeling tools. Since then, I have been involved in coaching and consulting with several customer projects for Xtext.

My focus today is mostly with projectional language workbenches, which provide a quite different approach to (textual) DSLs, simplifying language modularization and composition significantly. Intentional Software, for whom I have worked in 2007/2008 and JetBrains MPS (with which I am working today) are the two leading implementations of this idea.

**Architecture DSLs:** As part of my passion for the conceptual aspects of software architecture, I have been working on expressing architecture formally, using DSLs, and integrating variability management into it. I have since used this approach in various customer projects.

**Projectional Editing:** mbeddr aims at creating a different way of developing embedded software systems: instead of using archaic modeling tools and manually written C code, we use the open source JetBrains MPS language workbench to create a holistic approach to embedded development, where C programming, modeling, domain specific extensions, verification and product line variability are supported directly.

**Business DSLs:** Since 2015 we have focused our work on building DSLs for non-programmers, exploiting the notational flexibility and language modularity afforded by MPS. We have designed, build and introduced languages in the domains of automotive, insurance, health, salary calculation, and others.

## Management & Leadership

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Except for my 2-year stint as the Mathema Ulm office, I have never acted as a line manager. However, I have successfully led many development projects and teams. The most relevant examples are also the most recent:

Between 2011 and 2014 I acted as the PI for the mbeddr project. Together with Bernd Kolb, I led the development team through the various milestones: my original idea, a successful KMU Innovativ research grant, a successful conclusion of the project, mbeddr becoming an Eclipse project and its use in various industry projects.

Between 2013 and 2014 I was leading the 8 person itemis/fortiss team that develops the ESD tool for Siemens PL (LMS) on top of mbeddr. My responsibilities included architectural guidance, feature negotiations with the customer and management of the day-to-day activities of the developers.

Since 2015 my role is comparable to a programme manager. I oversee and coordinate several teams and projects around language engineering and MPS. These include the evolution of mbeddr, development of Siemens ESD, a DSL project in the insurance industry plus a number of smaller MPS-based projects. It also includes working with members of my team and the MPS team at JetBrains to improve language engineering itself.

## Domains and Customers

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Since 1995 I have worked in the following domains, and for the following companies:

**Automotive:** BMW, Daimler/DaimlerChrysler, Opel, Peugeot, ZF, Bosch, Dynetics, Vector, Teradyne, bara electronics, Continental, LiveDevices, FEV, Audi

**Industry/Embedded:** Pilz, Bachmann, Zwick/Roell, Wieland, Liebherr, Trumpf, BMK, Schlumberger, EADS, BSH, Bayer, testo, Sennheiser, biotronik, ASML, Dynagen, BOSCH

**Science:** National Radio Astronomy Observatory (NRAO), European Southern Observatory (ESO), European Synchrotron Radiation Facility (ESRF)

**Telecoms:** Siemens mobile, Siemens Networks, NokiaSiemens Networks, T-Mobile, Rohde&Schwarz, NetCologne

**Software/IT:** Intentional Software, IBM, Siemens CT, SAP, Sun, Borland, ESG, T-Systems, logicaCMG, Sioux Embedded Systems, Mathema, Method Park, MID, msg, gentleware, coryx, paranor, Richtmann+Eder, adkomm, zühlke, accenture, Datev, Workday, Huawei

**Healthcare:** Dräger, GE Deutschland, Kliniken Heidenheim, Labor Dr. Gärtner, Siemens Audiologische Technik, Voluntas

**Logistics/Transportation:** Deutsche Flugsicherung, Deutsche Post, HHLA, Siemens Transportations Systems, Atron, Inform

**Finance:** FJA, CreditSuisse, metris, dvg, Finanz\_IT, eurodata, Commerzbank, avanon, Zürcher Kantonalbank, Zürich Versicherungen, Datev

**Media/Web:** Bertelsmann, web.de, combots, Avid, bwin, Ethereum Foundation

**Other:** AMTEC, Hacon, Schneider Electric, TIA, Matrixware, Bundesagentur für Arbeit, Prosoz, Dutch Tax Agency

## **Consulting and Development Projects**

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The following list is a selection of the projects on which I worked between 1995 and today, in different roles. In parallel, I have run various short consulting projects for the companies listed above.

### **2017**

- Prototyping of higher-level languages for smart contract specification
- Extension of KernelF with effects tracking, boxes and transactional memory
- Consulting for the Ethereum Foundation on the design of blockchain/contract programming languages; conceptual work on integrating blockchains with DSLs
- Consulting for a DSL-based approach for implementing the algorithmic core of DATEV's next-gen wage/salary calculation system, including a temporal type system for KernelF
- Architecture and meta-language design for itemis' new web-based language workbench.
- Product management for a web-based language workbench currently developed at itemis.
- Consolidation and documentation of our work on the combination of formal methods (model checking, SMT solving, data flow analysis) and DSLs.
- Consulting for Huawei on business DSLs with MPS in domains such as telecom pricing, data transformation and IOT

### **2016**

- Program management of MPS-based projects at itemis.
- PI for the IETS3 research project where integrate formal methods with DSLs for safety-critical system specification
- Design and implementation of KernelF, an extensible/embeddable functional language
- DSL for specifying medical algorithms for Voluntis
- Consulting for Apple in the context of DSL and MPS
- Consulting for Audi AEV on specification of interfaces for automotive software
- Consulting for Workday on DSL development for cloud apps
- Supporting BOSCH with a DSL for robot software development
- Supporting BOSCH with a DSL for synchronous embedded software development

### **2015**

- Main focus was on program management of the various MPS-based projects at itemis.
- Prototype a specification/verification tool for Engineered Mechatronics, Inc.
- Helped with the introduction of DSLs as part of product development at Prosoz.
- Supported Daimler with building a DSL for industrial robot control.

### **2014**

- Technical lead for a product development project on top of mbeddr for Siemens PL (LMS)
- Supporting a DSL development project for i2s in Portugal in the insurance domain based on MPS.
- Consulting for the Dutch Tax Agency in a project to reimplement and evolve their tax rule definition language in MPS.



Design and co-development of a DSL for Behavior-Driven Development and test generation in the telecoms domain for Huawei.

Design and implementation of a DSL for requirements modeling and mathematical consistency analysis of system specifications for an unnamed company in Japan.

Support of the design and implementation of an extensible version of Clafer in MPS, together with the GSD lab of the University of Waterloo.

Design and implementation of a prototype DSL for product configuration of industrial engine controllers for Dynagen Technologies.

## 2013

Consulting for Rohde&Schwarz SIT on a project for next-gen network crypto device; helped with requirements engineering and the DSL-based development process.

Technical lead for an open source and research project on using DSLs and language extension of C for embedded development: <http://mbeddr.com>

## 2011

Development of DSLs for many domain, e.g. embedded component architectures (BMW), refrigerator cooling algorithms (Bosch-Siemens Hausgeräte), hearing aid configuration (Siemens Audiologische Technik)

## 2008 - 2010

Many smaller consulting gigs for major companies on introducing model-driven development and openArchitectureWare for example at Wieland, Liebherr, FJA, Continental, web.de, Siemens A&D, Rohde & Schwarz, Bosch and others.

## 2007 - 2008

Senior independent consultant for Intentional Software helping out with customers, PR and tool development

## 2008

Architecture Consulting for bwin

Development of an Architecture DSL for Siemens Transportation Systems/Continental

## 2007

MDSO consulting for JAIN SLEE platform development at SIEMENS Networks

## 2006

Consultant and Architect for PrismTech's MDD tooling initiative

Model-Driven tool integration for ZF Friedrichshafen

## 2005

Consulting for T-Mobiles enterprise-wide SOA

## 2004 - 2005

Working with SIEMENS in AMPLE (Aspect-Oriented Model-Driven Product Line Engineering) EU research project, development of architecture DSLs and the integration of AO, PLE and MDD

Architectural Consulting for large, Peer-To-Peer System (web.de)

Consultant for Mobile Phone Software Architecture at Siemens

## 2004

Consultant for model-driven implementation of an embedded component architecture for BMW in the context of the AUTOSAR project. Development of Eclipse-based graphical modeling tools (GEF-based)

## 2003

Chief Architect client and server for DaimlerChrysler's Daisy project (Java, Eclipse, J2EE)

J2EE architecture and OSGi integration for General Motor's Proactive Maintenance project (J2EE, OSGi)

## 2002

Consulting for European Southern Observatory's ALMA telescope project, on component architecture and development process (Java, COR-BA, C++)

Architecture and component model for Himalaya II (dvg, German Sparkassen-EDV), (one of the biggest J2EE projects worldwide at the time)

## 2001

Architecture for Peugeot's distributed diagnosis system (J2EE)

## 2000

Architect of Daimler's PRODIKOS vehicle diagnosis project (Java, MQSeries, CORBA)

## 1998

Development of a web interface for a clinical information system

## 1997

Development of ZBS's n-sell web shop system (Java, CORBA)

Development of a data collection and evaluation system for Kliniken Heidenheim (Delphi, SQL Server)

## 1994 - 1995

Development of a medical lab information system (Clipper)

## **Software Development Skills**

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My current core competencies include language engineering for DSLs, code generation and model transformation, software architecture and product lines. While these are tool-independent, I have a lot of experience with Eclipse Modeling, Xtext and JetBrains MPS. The following provides a more complete overview of my IT related skills over the years:

Languages: Xtend, Scala, Java, C++, C#, Pascal, Delphi, SQL; some Ada, Smalltalk, Python

Middleware: CORBA, .NET Remoting, Java RMI, MoMs, diff. RDBMS, XML technologies

Platforms: J2EE, EJB, JMS, .NET, Spring, Hibernate, OSGi, JSF

OO: Frameworks, Patterns, meta-level architectures

Functional Programming based on the design and implementation of KernelF

Architecture: distributed systems, redundancy, load-balancing, embedded systems, AUTOSAR

Language Workbenches: JetBrains MPS expert, Eclipse Xtext professional, some Spoofox

Experience with the architecture of large, distributed systems

Experience with architecting distributed embedded systems

Middleware and Component Technology Expert

Eclipse Plugin Development

UML Professional; Tools incl. Enterprise Architect, MagicDraw, various IBM Rational tools

Recognized Expert on Model-Driven and Generative Software Development

Recognized Expert on Domain Specific Languages, lots of experience in industry projects

Architecture Specification (DSL) and Communication

Product Line Engineering methodologies and tools (e.g. pure::variants)