Dr. Markus Völter (Voelter)

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

LAST CHANGED 08/2019

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Markus works as an independent researcher, consultant and coach for language engineering, domain specific languages, model-driven software development, software architecture and product lines. 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 written several books on the subject and spoken at many industry conferences world-wide. An important aspect of Markus' work is to keep one foot in academia by publishing papers in peer-reviewed conferences and journals and through participation in academic conferences and workshops. 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

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. Get the book here:

http://voelter.de/data/books/GenericToolsSpecificLanguages-1.0-web.pdf

2009 - current

Independent Researcher, Architect and Consultant, with 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, völterSOFTWARE

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

Technical Competence

While I am an renowned 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 the 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 and in my podcasts.

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 350 podcast episodes (ca. 130 about software, the rest about other science and engineering topics).
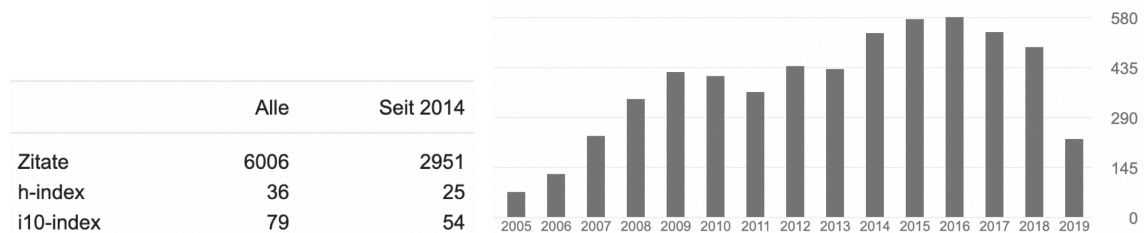
Research, Publications and Talks

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. Get the book here:

> http://voelter.de/data/books/GenericToolsSpecificLanguages-1.0-web.pdf

Citations, Indices (from Google Scholar)

	Alle	Seit 2014
Zitate	6006	2951
h-index	36	25
i10-index	79	54

http://scholar.google.nl/citations?user=pEijGjUAAAAJ&hl=en

Five Most Important Publications

1. [Book] M. Voelter, T. Stahl. *Model-Driven Software Development – Technology, Engineering, Management*. Updated translation of the German MDSD 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*, 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] Books and Booklets

1. M. Voelter. *The Design, Evolution and Use of KernelF*.
   http://voelter.de/data/books/kernelf-designEvoUse.pdf, 2018

2. M. Voelter, T. Szabo, B. Engelmann, K. Birken. *An Overview of Program Analysis using Formal Methods* (self-published).
   http://voelter.de/data/books/introToFormalMethodsAndDSLs-1.1.pdf, 2017

3. [Full Book] M. Voelter + Contributors. *DSL Engineering - Designing, Implementing and Using Domain-Specific Languages*. CreateSpace Publishing Platform (self-published),
   http://dslbook.org, 2013

4. [Full Book] 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

5. [Full Book] M. Voelter, T. Stahl, S. Efftinge, A. Haase. *Modellgetriebene Softwareentwicklung - Technik, Engineering, Management*. Updated 2nd German edition, dPunkt Verlag, 2007

6. [Full Book] M. Voelter, T. Stahl. *Model-Driven Software Development – Technology, Engineering, Management*. Updated translation of the German MDSD book, Wiley & Sons, 2006

7. [Full Book] M. Voelter, T. Stahl, J. Bettin. *Modellgetriebene Softwareentwicklung - Technik, Engineering, Management*. dPunkt Verlag, 2005

8. [Full Book] O. Vogel, I. Arnold, A. Chughtai, E. Ihler, U. Mehlig, T. Neumann, M. Voelter, U. Zdun. *Software Architektur (1st Ed)*. Spektrum Verlag, 2003

9. [Full Book] M. Voelter, M. Kircher, U. Zdun. *Remoting Patterns – Patterns for enterprise, internet & embedded middleware (*part of the Pattern Series). Wiley & Sons, 2004

10. [Full Book] 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

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

[BC] Book Chapters

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 Rummler (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 Peper (Eds.), *Component-Based Software Development for Embedded Systems,* Springer, LNCS 3778, 2005

[JP] Journal Papers (Peer-Reviewed)

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)

1. M. Voelter, S. Lisson, K. Birken, A. Rimer. *Shadow Models - Incremental Transformations for MPS*. Accepted for Tool Demos Track at the SLE 2019.

2. M. Voelter. *Fusing Modeling and Programming into Language-Oriented Programming*. Invited Paper, Unified View on Modeling and Programming Track, ISoLA 2018, 30 Pages, 2018.

3. T. Szabo, G. Bergmann, S. Erdweg, M. Voelter. *Incrementalizing Lattice-Based Program Analyses in Datalog*. OOPSLA 2018, 30 pages, 2018

4. M. Voelter. *The Design, Evolution and Use of KernelF*. ICMT 2018 (invited paper). 80 pages. 2018

5. F. Steimann, M. Frenkel, M. Voelter. *Robust Projectional Editing*. The 10th International Conference on Software Language Engineering (SLE 2017), 12 pages, 2017

6. 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)

7. 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

8. 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*

9. 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

10. 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

11. 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

12. D. Pavletic, M. Voelter, S. A. Raza, B. Kolb, T. Kehrer. *Extensible Debuggers for Extensible Languages*. Proc. of Ada-Europe 2015, 14 pages, 2015

13. 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

14. 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

15. 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

16. 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

17. 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

18. D. Ratiu, M. Voelter, B. Kolb, B. Schaetz. *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

19. M. Voelter, D. Ratiu, B. Kolb, B. Schaetz. *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

20. 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

21. 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

22. 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

23. 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

24. 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)

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*, 15th 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)

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 Experential 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

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

1. *The design and evolution of KernelF*, ICMT 2018 (International Conference on Model Transformation), 2018

2. *Domain-Specific Languages in SPLE: Why and How?*, SPLC 2018 (Systems & Software Product Line Conference), 2018

3. *Lessons learned about language engineering from the development of mbeddr*, ITSLE (Industry Track for Software Language Engineering), 2016

4. *The State of the Art in Language Workbenches*, 6th International Workshop on Domain-Specific Languages and models for Robotic systems (DSLRob-15), IROS 2015

5. *Introducing Language-Oriented Business Applications*, JAX London 2014

6. *Language Workbenches: Opportunities and Challenges for Verification and Validation*, MoDeVVA 2014 Workshop at MODELS 2014

7. *Language Shapes (Architectural) Thought*, European Conference on Software Architecture (ECSA), 2014

8. *Architecting Architecture DSLs*, International Workshop on DSL Architecting & DSL-based Architectures (DADA'14), ECSA 2014

9. *Generic Tools, Specific Languages.* Software Development Automation Conference (SDA) 2013, Amsterdam

10. *Domain-Specific Language Design - A framework for building good DSLs*, CodeGeneration Conference (CG) 2012, Cambridge

11. *Trends in Programming Languages*, International Conference on Accelerator Physics and Large Experimental Physics Control Systems (ICALEPCS) 2011, Grenoble

12. *Thoughts on DSLs und PLE,* MAPLE/Scale Workshop, SPLC 2011, München

13. *The state of the art in (external) DSLs.* Workshop on Generative Techniques WGT 2011 Workshop, Saarbrücken

14. *Language Workbenches als Basis fuer integrierte Sprachentwicklung.* 3. Workshop Methodische Entwicklung von Modellierungswerkzeugen, Informatik 2011, Berlin

15. *DSLs and Product Lines*, Fifth International Workshop on Variability Modelling of Software-intensive Systems (VAMOS) 2011, Namur

16. *Language Workbenches and Software Product Lines*, Practical Product Lines Conference, (PPL) 2009, Amsterdam

17. *MDD: The Good, The Bad and The Ugly* (together with S. Kelly), CodeGeneration Conference (CG) 2009, Cambridge

[IT] Invited Talks, Summer Schools

1. M. Voelter, *The future of DSLs - functions and formal methods*, Curry On 2019

2. M. Voelter, *Fusing Modeling and Programming into Language-Oriented Programming*, ISoLA 2018, UVMP Track, 2018

3. M. Voelter, *Modeling of Business Logic to enhance Business Agility*, Models 2018 Industry Track, 2018

4. M. Voelter, *Why Modeling Sucks Sucks.* Java User Group Ostfalen, 2018

5. M. Voelter, *How Domains Shape Languages.* SPLASH 2016, Industry/Inspiring/Invited Track, Amsterdam, 2016

6. M. Voelter, *KernelF - Designing an extensible and embeddable functional language*, IFIP WG 2.16 Meeting, Lausanne, 2016

7. M. Voelter, *Language-Oriented Business Applications - Helping End Users become Programmers*, SPLASH-I 2015, 2015

8. M. Voelter, *Die Rolle von Modellen im Embedded Software Engineering*, Modeling of Embedded Systems Conference, 2015

9. M. Voelter, *Thoughts on the Collaboration between Software Engineers and Domain Experts* (Dinner Speech), European Conference of Software Engineering Education 2014, 2014

10. M. Voelter, *mbeddr's Support for Variability - features and challenges*, FOSD Workshop, 2014

11. M. Voelter, *DSL Design*, 3rd International Summer School on Domain-Specific Modeling – Theory and Practice, Lisbon, 2012

12. M. Voelter, *mbeddr Language Design*, IFIP WG 2.16 Meeting, Austin, 2012

13. M. Voelter, *Modeling and Progamming - isn't it all the same?* CHOOSE Forum 2012

14. M. Voelter, *Models, DSLs and Code Generation*, CERN Computing Seminar, 2012

15. M. Voelter, *Trends in Programming Languages*, ICALEPCS, 2011

16. M. Voelter, *Language and IDE Development, Modularization and Composition with MPS*, GTTSE, 2011

17. M. Voelter, *Textual DSLs in Practice*, Modellierung, 2011

18. M. Voelter, *Thoughts on DSLs und PLE*, MAPLE/SCALE Workshop, 2011

19. M. Voelter, *Domain-Specific Languages for Requirements*, RefSQ Industry Track, 2011

20. M. Voelter, *Practical textual DSLs with Xtext and MPS*, Workshop on OCL and Textual Modelling, 2010

21. M. Voelter, *DSLs - Examples, Tools, Practices.* 3rd Reuse In Software Engineering (RISE) International Summer School, 2010, Salvador da Bahia, 2010

[SW] Seminars and Workshops

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

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

1. M. Voelter, *Using Language Workbenches and Domain-Specific Languages for Safety-Critical Software Development*, SE 2019

2. M. Voelter, *Build your own Language - Why and How?* GotoAMS, 2019

3. M. Voelter, *Complete Isolation of Business Logic using DSLs*, The Architecture Gathering, Munich, 2016

4. M. Voelter, *Building mbeddr – a Language Engineering Experiment.* GPCE 2014 Tech Talk

5. M. Voelter. *The Art of Building Tools – A Language Engineering Perspective.* Öredev 2013

6. M. Voelter. *The State-of-the-Art in Language Workbenches.* OOP 2013

7. M. Voelter, D. Ratiu. *Language Workbenches, Embedded Software and Formal Verification,* MODELS 2012

8. M. Voelter *Domain-Specific Language Design.* ICSE 2012

9. M. Voelter. *Testen von DSLs.* OOP 2012

10. M. Voelter. *DSLs for Product Lines - Approaches, Tools, Experiences.* SPLC 2011

11. M. Voelter. *Type Systems for DSLs.* Code Generation 2011

12. M. Voelter, E. Visser. *Language Composition and Extension with Language Workbenches.* SPLASH 2010

13. M. Voelter. *Language Definition and Extension with MPS.* GPCE 2010

14. M. Voelter. *Erweiterbare Programmiersprachen fuer die Embedded-Entwicklung.* ESE Kongress 2010

15. M.Voelter, A. Haase, H. Seeberger. *Durchstarten mit Scala.* JAX 2010

16. M. Voelter, P. Friese. *Software Engineering mit Domänenspezifischen Sprachen und Language Workbenches,* SE 2010

17. M. Voelter. *Textual DSLs and Code Generation with Eclipse Tools.* Microsoft DSL Devcon, 2010

18. M. Voelter. *Architecture As Language.* OOPSLA 2008

19. M.Voelter, B. Kolb. *An introduction to Model-driven-development using Eclipse Tools,* EclipseCon 2008

20. M. Voelter. *Writing Adaptable Software - Mechanisms for Implementing Variability in Code & Models.* JAOO 2007

21. M. Voelter, Doug Schmidt. *Model-Driven Development of Distributed Systems*. OOPSLA 2006

22. M. Voelter. *Model-Driven Development of Distributed Systems*. ICALEPCS 2005

23. M. Voelter. *The Role of Patterns in Modern Software Engineering*. JAOO 2005

24. M. Voelter. *Source Code Generation - Concepts, Techniques and Tools*. ECOOP 2003

[MM] Multimedia

1. [Conf Talk Video] Build your own Language: Why & How? GotoAMS 2019,
   https://www.youtube.com/watch?v=9BvpBLzzprA

2. [Conf. Keynote Video] *Language-Oriented Business Applications,*
   Recorded at JAX London, 2014
   http://jaxenter.com/turn-business-users-software-programmers-117248.html

3. [Conf. Talk Video] *The Art of Building Tools – A Language-Engineering Perspective,*
   Recorded at Craft Conference, 2014
   http://www.ustream.tv/recorded/46664399

4. [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/

5. [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/

6. [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

7. [Conf. Talk Video] *Working with Multiple Languages: Why and How*.
   Recorded at Code Generation 2013.
   http://www.infoq.com/presentations/tutorial-polyglotism

8. [Conf. Talk Video] *DSL Design - A Framework for Building Good DSLs*.
   Recorded at Code Generation 2012.
   http://www.infoq.com/presentations/DSL-Design

9. [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

10. [Video Interview] *DSLs, Modeling, MPS, mbeddr*
    Recorded at Code Generation 2012.
    http://www.infoq.com/interviews/voelter-mps-modeling-dsl

11. [Conf. Talk Video] *Type Systems for DSLs*
    Recorded at Code Generation 2011.
    http://www.infoq.com/presentations/Type-Systems-for-DSLs

12. [Video Interview] *Software Architecture Documentation*
    Recorded at OOPSLA 2007
    http://www.infoq.com/interviews/MarkusVoelteraboutSoftwareArchitectureDocumentation

Other Committee Memberships

Formal Methods Europe, Industry Panel, 2019 – now.

Software Language Engineering Conference, Steering Committee, 2015 – 2019

Conference/Program Chairs

Models 2019 Tool Demo Track Co-Chair

SLE 2015 Program Co-Chair

MODELS 2008, Experience Track co-chair

GPCE 2003, Demonstrations chair

Conference Program Committees

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

Language Workbench Challenge @ SLE 2016

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

Produktliniem 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-Variabilitaet im gesamten Lebenszyklus (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. Schwanninger, 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. Gonzalez-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 specifications for DSLs (with T. Cleenewerck, K. Czarnecki, J. Striegnitz), ECOOP 2004

Reuse in Constrained Environments (with M. Kircher, U. Zdun, C. Schwanninger, 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. Wegener, 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. Czarnecki), 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. Eckstein, 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

GPCE 2017

GEMOC 2017

GEMOC 2016

DSLDI 2016

LWC 2016

GEMOC Workshop
MODELs'15

DSL Design and Implementation,
SPLASH 2014

Globalization of Modeling Languages,
Models 2014

2nd Workshop on View-Based, Aspect-
Oriented and Orthographic Software
Modelling, STAF 2014

Open Source Software for MDE
MODELS'14

Domain-Specific Modeling,
SPLASH 2013

Model-Driven Approaches in Product
Line Engineering, SPLC 2012

Product LinE Approaches in Software
Engineering, ICSE 2011

Model-based Engineering for Real-Time
Embedded Systems, MoBE-RTES 2011

Domain Specific Modeling, SPLASH 2012

Domain Specific Modeling, SPLASH 2010

Product LinE Approaches in
Software Engineering, ICSE 2010

Automated Configuration and Tailoring of
Applications, ASE 2010

Academic Software Development Tools,
ASE 2010

Model-Driven Approaches in PLE,
SPLC 2010

Model-Driven Product Line Engineering,
ECMFA 2010

From code centric to model centric -
Evaluating the effectiveness of MDD,
ECMFA 2010

Domain-Specific Modeling,
OOPSLA 2009

Aspect Oriented Modeling Workshop,
AOSD 2009

Domain Specific Modeling 2008,
OOPSLA 2008

Early Aspects @ SPLC, SPLC 2008

Domain Specific Modeling 2007,
OOPSLA 2007

Aspect Oriented Modeling,
MODELS 2007

Aspect-Oriented Modeling, ECMDA 2007

MDSD heute, SE 2007

Aspect-Oriented Modeling, AOSD 2007

Domain-Specific Modeling,
OOPSLA 2006

Aspect-Oriented Product Line
Engineering, GPCE 2006

Research Projects/Grants

IETS3 (2016 – 2018)

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

- 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

IFIP Working Group 2.16 on Programming Language Design

Association for Computing Machinery

Hillside Europe

Teaching Experience

[FC] Full Courses

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 Bezivin)

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

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*.*
*P*rof. 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. *MDSD and textual DSLs*.
*P*rof. 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, *MDSD Best Practices*.
Prof. Dr. Mira Mezini, 2007

[SU] Student Supervision

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, Studiengant, 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

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

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 320 episodes on topics such as particle physics, astronomy, biochemistry, space and aviation.

Industry Experience

Innovation Projects

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 afforted by MPS. We have designed, build and introduced languages in the domains of automotive, insurance, health, salary calculation, and others.

Management & Leadership

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

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, Voluntis, ClosedLoopMedicine

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

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.

2019

Language and tool consulting for Closed Loop Medicine in the UK.

SIGI continued from 2018

DATEV continued from 2018.

Language design consulting for another department of DATEV.

2018

Managing the technical aspects of the development of a DSL for payroll calculations for DATEV, Germany's primary payroll service provide.

Consulting with SIGI, Luxembourg, on the design, implementation and runtime architecture of a DSL for public administration software.

Consulting with BOSCH CR on the design and development of a DSL for safety analysis using model checking and fault trees.

Development of a tutorial that teaches non-programmers the basics of programming: https://markusvoelter.github.io/ProgrammingBasics/

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, working on the approach to using DSLs in safety-critical systems.

Consultung 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 developmenet

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 Technlogies.

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

MDSD 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

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 Spoofax

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)