Curriculum Vitae

o.Univ.-Prof. Dr. Dr. h.c. Hanspeter Mössenböck

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PERSONAL INFORMATION

Date of Birth	20 January 1959
Place of Birth	Schwanenstadt (Upper Austria)
Citizenship	Austrian
Marital Status	Married, 2 children

EDUCATION

1978 - 1983	Diploma in Computer Science, JKU Linz
1983 - 1987	PhD in Computer Science, JKU Linz

ACADEMIC CAREER

1980 - 1983	Student assistant, JKU Linz
1983 - 1987	PhD student and teaching assistant, JKU Linz
1987 - 1988	Postdoc, University of Zurich
1988 - 1994	Assistant Professor, ETH Zurich
1990 - 1994	President of CHOOSE (Swiss Group for OO Systems)
1994 -	Full Professor of Computer Science, JKU Linz
1997 - 2000	Head of the Institute for Practical Computer Science
2004 -	Head of the Institute for System Software
2006 - 2013	Head of the Christian Doppler Laboratory for Automated Software Engineering
2019 - 2022	Head of the Academic Senate of JKU Linz

INTERNATIONAL EXPERIENCE

1987 - 1988	Postdoc, University of Zurich
1988 - 1994	Assistant Professor, ETH Zurich
1997 -	Annual Erasmus/Ceepus teaching mobility (UK, Eastern Europe)
2000	Sabbatical at Sun Microsystems, California (3 months)

MEMBERSHIPS

ACM, IEEE, OCG (Austrian Computer Society)

AWARDS AND HONORS

1983	Richard Büche Award for the Master's Thesis
1987	PhD graduation "sub auspiciis praesidentis rei publicae"
1989	Education Award from the Computer Science department of ETH Zurich for the best course of the year
2006	Honorary Doctorate from the University of Budapest (ELTE)
2018	Honorary Senator of the Technical University Graz

A RESEARCH

A.1 Research Areas

- *Programming Languages and Compilers*
  Compiler Optimizations, Compiler Generators, Domain-specific Languages

- *System Software*
  Virtual Machines, Garbage Collectors, Software Testing, Performance Monitoring

- *Software Architectures*
  Frameworks, Design Patterns, Components, Software Tools

A.2 Selected Research Projects

Dynamic Compilation and Virtual Machines
Jan. 2001 - now, funded by Oracle Labs, USA
Together with Oracle Labs we are extending and optimizing Oracle's just-in-time compilers as well as the HotSpot Java virtual machine. Some of our compiler optimizations became part of Oracle's product JDK. Currently we are working on GraalVM, Oracle's new multi-language VM with a self-optimizing language implementation framework (Truffle) and a highly optimizing just-in-time compiler (Graal). The GraalVM originated at our institute and is now an official product of Oracle. It is already used by Twitter, Goldman Sachs and other major IT companies.

Christian Doppler Laboratory for Monitoring and Evolution of Very-large-scale Software Systems
Feb.2013 - Jan. 2020, funded by CDG, Primetals, KEBA AG, Dynatrace
Our institute coordinates 2 of the 3 modules in this CD laboratory. Together with KEBA, we work on multi-modeling and evolution of software ecosystems. Together with Dynatrace, we do research on Application Performance Monitoring. This includes research on static analysis of programs, on VM monitoring and instrumentation, and on tracing and analysis of programs.

Meta-level Engineering and Tooling for Complex Concurrent Systems
March 2016 - Feb. 2021, intl. cooperation project funded by FWF and FWO
The goal of this project is to devise a common mechanism for building debugging tools that are able to represent concurrency aspects of programs in a high-level way so that developers can better understand the software they build. We also investigate how to implement such a common mechanism efficiently.

Christian Doppler Laboratory for Automated Software Engineering
Feb.2006 - Jan. 2013, funded by CDG, Siemens VAI, KEBA AG, BMD GmbH
Located at the Institute for System Software (JKU Linz) and headed by H. Mössenböck. 6 PhD students, several master students; major research areas:
- Software Product Line Engineering (with Siemens VAI and Siemens AG)
- Tracing and Analysis of Real-time automation systems (with KEBA AG)
- Plugin Component Architectures (with BMD GmbH)

Generalization of Just-in-Time Trace Compilation for Java
Jul. 2010 - Sept. 2013, funded by the FWF, P 22493-N18
This project dealt with new techniques for JIT-compiling frequently executed traces of interpreted programs to machine code. In contrast to other trace compilers, which concentrate on traces that start at loop headers, we looked at generalized traces that can start everywhere. An important aspect of this research is trace inlining, in which we exploit context information from call sites in order to specialize the inlined traces.

Compiler Generation Tools for C#
Sept. 2002 - Aug. 2003, funded by Microsoft
Our compiler generator Coco/R was extended so that it can parse non LL(1) grammars. Based on this tool we created a general parsing framework for C# programs that can be used as the core of other tools such as analyzers, preprocessors or testing tools.

Flexible Notification Semantics in Distributed Object Systems
Sept. 2001 - Aug. 2003, funded by the FWF (Austrian Science Foundation), P14575-INF
Notifications are used to keep distributed data on different computers consistent. In most cases it is not possible to use only one approach of notification handling to model different aspects of distribution, consistency, optimizations, data mapping, etc. The goal of this project was to implement a framework which controls the flow of notifications between (distributed) components. The flow of notifications is specified in a flexible way by composition of different connection types and data mappings.

REFORM – A Reusable Framework for Rolling Mills
Dec.1996 - Nov. 1999, funded by the EU, Esprit 22897
Development of an object-oriented framework for the steel industry. This was a European Esprit project with an industrial touch. Our part was the mathematical modeling and the visualization framework for the plant.
Partners: Siemens (Germany), Mandator (Sweden), Voest Alpine Stahl (Austria), USP (Austria), Universities of Hamburg and Linz.

Framework Design and Documentation
Sept. 1996 - Apr. 1999, funded by the FWF, P11350-TEC
We developed a new design method for object-oriented frameworks, which we called "design by stepwise generalization". We also developed a text framework with hypertext elements that allowed users to document object-oriented software by annotations directly in the source code.

Structuring and Browsing of Object-Oriented Programs
Sept. 1994 - Aug. 1995, funded by the FWF, P10271-TEC
We developed a tool, which traces the message flow in object-oriented programs and visualizes it. We used zooming, filtering and folding techniques to manage the enormous amount of objects and messages in a running system. We also developed hypertext techniques (linking, folding, annotating, versioning) to structure the source code of a program.

A.3 Publications

Books

(9) H. Mössenböck: *Compilerbau - Grundlagen und Anwendungen*. dpunkt.verlag, 2024

(8) H. Mössenböck: *Sprechen Sie Java? Eine Einführung in das systematische Programmieren*. dpunkt.verlag
- First edition 2000
- Second edition 2001
- Third extended edition 2005
- Fourth extended edition 2011
- Fifth extended edition 2014

(7) H. Mössenböck: *Kompaktkurs C#*. dpunkt.verlag
- First German edition 2003
- Second extended German edition 2006
- Third extended German edition 2009 (renamed to *Kompaktkurs C# 4.0*)
- Fourth extended German edition 2015
- Sixth extended German edition 2016 (renamed to *Kompaktkurs C# 6.0*)
- Seventh extended German edition 2019 (renamed to *Kompaktkurs C# 7*)
- English edition 2005 (*C# to the Point,* Addison-Wesley)

(6) W. Beer, D. Birngruber, H. Mössenböck, A. Wöß: *Die .NET-Technologie*. dpunkt.verlag
- First German edition 2002
- Second German edition 2006
- English edition 2004 (*.NET Application Development,* Addison-Wesley)

(5) H. Mössenböck (ed.): *Modular Programming Languages*. Proceedings of the Joint Modular Languages Conference 1997. Lecture Notes in Computer Science 1204, Springer-Verlag 1997

(4) H. Mössenböck: *Object-Oriented Programming in Oberon-2*. Springer-Verlag
- German edition 1993
- English edition 1993
- Third, revised edition 1998

(3) P. Rechenberg, H. Mössenböck: *A Compiler Generator for Microcomputers*. Hanser-Verlag
- German edition 1985 (1st edition), 1988 (2nd edition)
- English edition 1988 (published by Prentice Hall)
- Japanese edition 1991 (published by Information and Computing)

(2) H. Mössenböck: *Compilererzeugende Systeme für Mikrocomputer*. PhD thesis, Trauner-Verlag, 1987.

(1) G. Blaschek, A. Diener, H. Mössenböck, G. Pomberger, F. Ritzinger, W. Wininger: *Lilith und Modula-2; Werkzeuge der Softwaretechnik*. Hanser-Verlag, 1985.

Book Chapters

(6) P. Rechenberg, H. Mössenböck: Programmierung. In: H. Czichos und M. Hennecke (Hrsg.): Hütte – Das Ingenieurwissen. 33. Auflage, Springer-Verlag, 2008.

(5) H. Mössenböck: *Web-Programmierung*. In: P. Rechenberg, G. Pomberger: Informatik-Handbuch, 4. Auflage, Hanser-Verlag 2006.

(4) G. Pomberger, H. Mössenböck, P. Rechenberg: *Niklaus Wirth - A Pioneer of Computer Science*. In: Böszörmeny et al.(eds): The School of Niklaus Wirth, dpunkt.verlag 2000, pp.5-20

(3) H. Mössenböck: *Compiler Construction - The Art of Niklaus Wirth*. In: Böszörmeny et al.(eds): The School of Niklaus Wirth, dpunkt.verlag 2000, pp.55-68

(2) H. Mössenböck: *Übersetzer*. In: P.Rechenberg, G.Pomberger: Informatik-Handbuch, Hanser-Verlag 1997.

(1) H. Mössenböck: *Systemsoftware*. In: P.Rechenberg, G.Pomberger: Informatik-Handbuch, Hanser-Verlag 1997.

Refereed Papers in Journals and International Conferences

(163) Garn, J.; Angerer, F.; Mössenböck, H.: Generating Java Interfaces for Accessing Foreign Objects. Work-in-progress paper. Intl. Conf. on Managed Programming Languages & Runtimes (MPLR'23), Oct. 22, 2023, Lisbon, pp.173-178

(162) Pichler, Ch.; Li, P.; Schatz, R.; Mössenböck, H.: Hybrid Execution: Combining Ahead-of-Time and Just-in-Time Compilation. Intl. Workshop on Virtual Machines and Language Implementations (VMIL'23), Oct. 23, 2023, Lisbon, pp.39-49

(161) Pekarek, D.; Mössenböck, H.: Extraction of Virtual Machine Execution Traces. Work-in-progress paper. Intl. Workshop on Virtual Machines and Language Implementations (VMIL'23), Oct. 23, 2023, Lisbon, pp.94-99

(160) Kloibhofer, S; Makor, L.; Leopoldseder, D.; Bonetta, D; Stadler, L; Mössenböck, H.: Control Flow Duplication for Columnar Arrays in a Dynamic Compiler. The Programming Journal, vol. 7, issue 3, article 9, February 2023, , pp.1-38. Presentation at the <Programming> Conference 2023, March 13-17, 2023, Tokyo, Japan

(159) Mosaner, R.; Barany, G.; Leopoldseder, D.; Mössenböck, H.: Improving Vectorization Heuristics in a Dynamic Compiler with Machine Learning Models. Workshop on Virtual Machines and Language Implementations (VMIL'22), at SPLASH'22, Dec.5-10, 2022, Auckland, New Zealand, pp.36-47

(158) Kreindl, J.; Bonetta, D.; Stadler, L.; Leopoldseder, D.; Mössenböck, H.: Dynamic Taint Analysis with Label-Defined Semantics. 19th Intl. Conf. on Managed Programming Languages and Runtimes (MPLR'22), Brussels, Sept. 14-15, 2022, pp.64-84

(157) Makor, L.; Kloibhofer, S.; Leopoldseder, D.; Bonetta, D.; Stadler, L.; Mössenböck, H.: Automatic Array Transformation to Columnar Storage at Run Time. 19th Intl. Conf. on Managed Programming Languages and Runtimes (MPLR'22), Brussels, Sept. 14-15, 2022, pp.16-28

(156) Mosaner, R.; Leopoldseder, D.; Kisling, W.; Stadler, L.; Mössenböck, H.: Machine-Learning-Based Self-optimizing Compiler Heuristics. 19th Intl. Conf. on Managed Programming Languages and Runtimes (MPLR'22), Brussels, Sept. 14-15, 2022, pp.98–111

(155) Mosaner, R.; Leopoldseder, D.; Kisling, W.; Stadler, L.; Mössenböck, H.: Compilation Forking: A Fast and Flexible Way of Generating Data for Compiler-Internal Machine Learning Tasks. The Programming Journal, vol. 7, issue 1, article 3, June 2022, pp.1-29

(154) Latifi, F.; Leopoldseder, D.; Wimmer, C.; Mössenböck, H.: CompGen: Generation of Fast JIT Compilers in a Multi-Language VM. 17th Dynamic Languages Symposium (DLS'21) at SPLASH'21, Oct. 17-22, 2021, Chicago, IL, USA, pp.34-47

(153) Kreindl, J.; Bonetta, D.; Stadler, L.; Leopoldseder, D.; Mössenböck, H.: Low-Overhead Multi-Language Dynamic Taint Analysis on Managed Runtimes through Speculative Optimization. 18th Intl. Conf. on Managed Programming Languages and Runtimes (MPLR'21), Sept. 29-30, 2021, Münster, Germany, pp.70-87.

(152) Mosaner, R.; Leopoldseder, D.; Stadler, L.; Mössenböck, H.: Using Machine Learning to Predict the Code Size Impact of Duplication Heuristics in a Dynamic Compiler. WIP paper, 18th Intl. Conf. on Managed Programming Languages and Runtimes (MPLR'21), Sept. 29-30, 2021, Münster, Germany, pp.127-135.

(151) Pekarek, D.; Mössenböck, H.: Architecture-Agnostic Dynamic Type Recovery. WIP paper, 18th Intl. Conf. on Managed Programming Languages and Runtimes (MPLR'21), Sept. 29-30, 2021, Münster, Germany, pp.54-60.

(150) Schörgenhumer, A.; Natschläger, T.; Grünbacher, P.; Kahlhofer, M.; Chalupar, P.; Mössenböck, H.: An Approach for Ranking Feature-based Clustering Methods and its Application in Multi-System Infrastructure Monitoring. Euromicro Conference on Software Engineering and Advanced Applications (SEAA'21), September 1-3, 2021, Palermo, Italy, pp.178-187

(149) Weninger, M.; Gander, E.; Mössenböck, H.: Guided Exploration: A Method for Guiding Novice Users in Interactive Memory Monitoring Tools. Proceedings of the ACM on Human-Computer Interaction (PACMHCI'21), Vol. 5, Issue EICS, Article 209, 2021, pp.1-34.

(148) Aumayr, D.; Marr, S.; Kaleba, S.; Gonzalez Boix, E.; Mössenböck, H.: Capturing High-level Nondeterminism in Concurrent Programs for Practical Concurrency Model Agnostic Record & Replay. The Art, Science, and Engineering of Programming, Vol. 5, Issue 3, Article 14, 2021, pp.1-38.

(147) Weninger, M.; Makor, L.; Mössenböck, H.: Memory Leak Analysis using Time-Travel-based and Timeline-based Tree Evolution Visualizations. 7th Conference on Smart Tools and Applications in Graphics (STAG'20), November 12 - 13, 2020, Online, pp.1-13 (Best Paper Award).

(146) Schörgenhumer, A.; Grünbacher, P.; Mössenböck, H.: Selecting Time Series Clustering Methods based on Run-Time Costs. 11th Symposium on Software Performance (SSP'20) - published in GI Softwaretechnik-Trends, November 12 - 13, 2020, Leipzig, Germany, Paper no.1.

(145) Weninger, M.; Makor, L.; Mössenböck, H.: Heap Evolution Analysis Using Tree Visualizations. 11th Symposium on Software Performance (SSP'20) - published in GI Softwaretechnik-Trends, November 12 - 13, 2020, Leipzig, Germany, Paper no.6.

(144) Weninger, M.; Gander, E.; Mössenböck, H.: Investigating High Memory Churn via Object Lifetime Analysis to Improve Software Performance. 11th Symposium on Software Performance (SSP'20) - published in GI Softwaretechnik-Trends, November 12 - 13, 2020, Leipzig, Germany, Paper no.7.

(143) Kreindl, J.; Bonetta, D.; Stadler, L.; Leopoldseder, D.; Mössenböck, H.: Multi-language Dynamic Taint Analysis in a Polyglot Virtual Machine. 17th International Conference on Managed Programming Languages and Runtimes (MPLR'20), November 4, 2020, Virtual UK, pp.15-29

(142) Kloibhofer, S.; Pointhuber, T.; Heisinger, M.; Mössenböck, H.; Stadler, L.; Leopoldseder, D.: SymJEx: Symbolic Execution on the GraalVM. 17th International Conference on Managed Programming Languages and Runtimes (MPLR'20), November 4, 2020, Virtual UK, pp.63-72

(141) Pekarek, D.; Mössenböck, H.: trcview: Interactive Architecture-agnostic Execution Trace Analysis. 17th International Conference on Managed Programming Languages and Runtimes (MPLR'20), November 4, 2020, Virtual UK, pp.89-97

(140) Weninger, M.; Makor, L.; Mössenböck, H.: Memory Cities: Visualizing Heap Memory Evolution Using the Software City Metaphor. 8th IEEE Working Conference on Software Visualization (VISSOFT'20), 28-29 September, 2020, Adelaide, Australia (moved online), pp.110-121 (Best Paper Award)

(139) Krauss, O.; Mössenböck H.; Affenzeller M.: Towards Knowledge-guided Genetic Improvement. 2020 IEEE/ACM Intl. Workshop on Genetic Improvement (GI) at ICSE'20, June, 2020, Seoul, South Korea, pp.293-294.

(138) Weninger, M.; Makor, L.; Mössenböck, H.: Memory Leak Visualization using Evolving Software Cities. 10th Symposium on Software Performance (SSP'19) - published in GI Softwaretechnik-Trends, November 4 - 6, 2019, Würzburg, Germany.

(137) Schörgenhumer, A.; Kahlhofer, M.; Chalupar, P.; Mössenböck, H.; Grünbacher, P.: On the Difficulties of Supervised Event Prediction based on Unbalanced Real-World Data in Multi-System Monitoring. 10th Symposium on Software Performance (SSP'19) - published in GI Softwaretechnik-Trends, November 4 - 6, 2019, Würzburg, Germany.

(136) Aumayr, D.; Marr, S.; Gonzalez Boix E.; Mössenböck, H.: Asynchronous Snapshots of Actor Systems for Latency-Sensitive Applications. Intl. Conf. on Managed Programming Languages and Runtimes (MPLR'19), 20-25 October, 2019, Athens, Greece, pp.157–171.

(135) Kreindl, J.; Bonetta, D.; Mössenböck, H.: Towards Efficient, Multi-Language Dynamic Taint Analysis. Intl. Conf. on Managed Programming Languages and Runtimes (MPLR'19), 20-25 October, 2019, Athens, Greece.

(134) Mosaner, R.; Leopoldseder, D.; Rigger, M.; Schatz, R.; Mössenböck, H.: Supporting On-Stack Replacement in Unstructured Languages by Loop Reconstruction and Extraction. Intl. Conf. on Managed Programming Languages and Runtimes (MPLR'19), 20-25 October, 2019, Athens, Greece.

(133) Weninger, M.; Gander, E.; Mössenböck, H.: Detection of Suspicious Time Windows in Memory Monitoring. Intl. Conf. on Managed Programming Languages and Runtimes (MPLR'19), 20-25 October, 2019, Athens, Greece.

(132) Rigger, M; Marr, S.; Adams, B.; Mössenböck, H.: Understanding GCC Builtins to Develop Better Tools. European Software Engineering Conference (ESEC/FSE'19), 26-30 August, 2019, Tallin, Estonia, pp.74-85.

(131) Krauss, O.; Mössenböck, H.; Affenzeller, M.: Mining Patterns from Genetic Improvement Experiments. 6th Intl. Workshop on Genetic Improvement (GI'19) at ICSE'19, May 28, 2019, Montreal, Canada, pp.1-2.

(130) Hinterplattner, S.; Sabitzer, B.; Demarle-Meusel, H.; Mössenböck, H.: Promoting Talents for Computer Science. 11th Intl. Conf. on Computer Supported Education (CSEDU'19), May 2-4, 2019, Heraklion, Greece, pp.1-8.

(129) Weninger, M.; Gander, E.; Mössenböck, H.: Analyzing Data Structure Growth Over Time to Facilitate Memory Leak Detection. 10th ACM/SPEC Intl. Conf. on Performance Engineering (ICPE'19), April 7-11, 2019, Mumbai, India, pp.273-284.

(128) Weninger, M.; Makor, L.; Gander, E.; Mössenböck, H.: AntTracks TrendViz: Configurable Heap Memory Visualization Over Time. 10th ACM/SPEC Intl. Conf. on Performance Engineering (ICPE'19), April 7-11, 2019, Mumbai, India, pp.29-32.

(127) Schörgenhumer, A.; Kahlhofer, M.; Grünbacher, P.; Mössenböck, H.: Can we Predict Performance Events with Time Series Data from Monitoring Multiple Systems? 10th ACM/SPEC Intl. Conf. on Performance Engineering (ICPE'19), April 7-11, 2019, Mumbai, India, pp.9-12.

(126) Schörgenhumer, A.; Kahlhofer, M.; Chalupar, P.; Grünbacher, P.; Mössenböck, H.: A Framework for Preprocessing Multivariate, Topology-Aware Time Series and Event Data in a Multi-System Environment. 19th IEEE Intl. Symp. on High Assurance Systems Engineering (HASE'19), Jan 3-5, 2019, Hangzhou, China, pp.115-122.

(125) Schörgenhumer, A.; Kahlhofer, M.; Chalupar, P.; Mössenböck, H.; Grünbacher, P.: Using Multi-System Monitoring Time Series to Predict Performance Events. 9th Symposium on Software Performance (SSP'18), Nov 8-9, 2018, Hildesheim, Germany

(124) Weninger, M.; Gander, E.; Mössenböck, H.: Analyzing the Evolution of Data Structures in Trace-Based Memory Monitoring. 9th Symposium on Software Performance (SSP'18), Nov 8-9, 2018, Hildesheim, Germany

(123) Leopoldseder, D.; Stadler, L.; Rigger, M.; Würthinger, T.; Mössenböck, H.: A Cost Model for a Graph-Based Intermediate-Representation in a Dynamic Compiler. Workshop on Virtual Machines and Language Implementations (VMIL'18), Nov 4, Boston, MA, USA, pp.26-35.

(122) Daloze, B.; Tal, A.; Marr, S.; Mössenböck, H.; Petrank, E.: Parallelization of Dynamic Languages: Synchronizing Built-in Collections. Intl. Conf. on Object-Oriented Programming Systems, Languages, and Applications (SPLASH / OOPSLA'18), Nov 4-9, Boston, MA, USA. In Proc. of the ACM on Programming Languages, Volume 2 Issue OOPSLA, November 2018, Article No. 108.

(121) Aumayr, D.; Marr, S.; Bera, C.; Gonzales Boix, E.; Mössenböck, H.: Efficient and Deterministic Record & Replay for Actor Languages. 15th Intl. Conf. on

Managed Languages and Runtimes (ManLang'18), Sept 12-13, Linz, Austria, Article 15.

(120) Eisl, J.; Leopoldseder, D.; Mössenböck, H.: Parallel Trace Register Allocation. 15th Intl. Conf. on Managed Languages and Runtimes (ManLang'18), Sept 12-13, Linz, Austria, Article 7.

(119) Kreindl, J.; Rigger, M.; Mössenböck, H.: Debugging Native Extensions of Dynamic Languages. Tool paper, 15th Intl. Conf. on Managed Languages and Runtimes (ManLang'18), Sept 12-13, Linz, Austria, Article 12.

(118) Leopoldseder, D.; Schatz, R.; Stadler, L.; Rigger, M., Würthinger, T.; Mössenböck, H.: Path Based Unrolling of Non-Counted Loops -- Loop Unrolling to Enable Compiler Optimizations. 15th Intl. Conf. on Managed Languages and Runtimes (ManLang'18), Sept 12-13, Linz, Austria, Article 2.

(117) Weninger, M.; Gander, E.; Mössenböck, H.: Detecting Memory Leaks by Utilizing Object Reference Graphs and Root Pointer Information in Offline Memory Monitoring. 15th Intl. Conf. on Managed Languages and Runtimes (ManLang'18), Sept 12-13, Linz, Austria, Article 14.

(116) Schörgenhumer, A.; Kahlhofer, M.; Mössenböck, H.; Grünbacher, P.: Using Crash Frequency Analysis to Identify Error-prone Software Technologies in Multi-System Monitoring. Proceedings of the IEEE Intl. Conf. on Software Quality, Reliability and Security (QRS'18), July 16-20, 2018, Lisbon, Portugal, pp. 183-190.

(115) Krauss, O.; Mössenböck, H.: Dynamic Fitness Functions for Genetic Improvement in Compilers and Interpreters. Proceedings of The Genetic and Evolutionary Computation Conference (GECCO'18), July 15-19, 2018, Kyoto, Japan, pp. 1590-1597.

(114) Grimmer, M.; Schatz, R.; Seaton, C.; Würthinger, T.; Lujan, M.; Mössenböck, H.: Cross-Language Interoperability in a Multi-Language Runtime. ACM Transactions on Programming Languages and Systems (TOPLAS), vol.40, issue 2, article 8, 2018. See also corrigendum in TOPLAS vol.40, issue 4, 2018.

(113) Weninger, M.; Mössenböck, H.: User-defined Classification and Multi-level Grouping of Objects in Memory Monitoring. Proceedings of the 9th ACM/SPEC International Conference on Performance Engineering (ICPE 2018), Berlin, Germany, April 9 - 13, 2018, pp.115-126.

(112) Rigger, M.; Marr, S.; Kell, S.; Leopoldseder, D.; Mössenböck, H.: An Analysis of x86-64 Inline Assembly in C Programs. 14th ACM International Conference on Virtual Execution Environments (VEE '18), Williamsburg, VA, USA, March 25, 2018, pp.84-99.

(111) Rigger, M.; Schatz, R.; Mayrhofer, R.; Grimmer, M.; Mössenböck, H.: Sulong, and Thanks For All the Bugs: Finding Errors in C Programs by Abstracting from the Native Execution Model. Proceedings of the Twenty-Third International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '18), Williamsburg, VA, USA, March 24 - 28, 2018, pp.377-391.

(110) Rigger, M.; Mayrhofer, R.; Schatz, R.; Grimmer, M.; Mössenböck, H.: Introspection for C and its Applications to Library Robustness. The Art, Science, and Engineering of Programming, 2018, Vol. 2, Issue 2, Article 4.

(109) Leopoldseder, D.; Stadler, L.; Würthinger, T.; Eisl, J.; Simon, D.; Mössenböck, H.: Dominance-based Duplication Simulation (DBDS) – Code Duplication to Enable Compiler Optimizations. International Symposium on Code Generation and Optimization (CGO), February 24-28, 2018, Vienna, Austria, pp.126-137.

(108) Torres Lopez, C.; Gonzales Boix, E.; Scholliers, C.; Marr, S.; Mössenböck, H.: A Principled Approach Towards Debugging Communicating Event-Loops. Proc. 7th ACM SIGPLAN Intl. Workshop on Programming Based on Actors, Agents, and Decentralized Control, Vancouver, Canada, Oct.23-27, 2017, pp.41-49.

(107) Torres Lopez, C.; Marr, S.; Mössenböck, H.; Gonzales Boix, E.: A Study of Concurrency Bugs and Advanced Development Support for Actor-based Programs. AGERE! workshop 2017, co-located with SPLASH'17, Oct.24, 2017, Vancouver, Canada, LNCS 10789, Springer-Verlag, 2018, pp.155-185.

(106) Marr, S.; Torres Lopez, C.; Aumayr, D.; Gonzalez Boix, E.; Mössenböck, H.: A Concurrency-Agnostic Protocol for Multi-Paradigm Concurrent Debugging Tools. 13th Symposium on Dynamic Languages (DLS'17), Vancouver, Canada, Oct. 24, 2017, pp. 3-14.

(105) Eisl, J.; Marr, S.; Würthinger, T.; Mössenböck, H.: Trace Register Allocation Policies: Compile-time vs. Performance Trade-offs. 14th Intl. Conf. on Managed Languages & Runtimes (ManLang'17), Prague, Czech Republic, Sept. 27-28, 2017, pp.92-104.

(104) Grimmer, M.; Marr, S.; Kahlhofer, M.; Wimmer, C.; Würthinger, T.; Mössenböck, H.: Applying Optimizations for Dynamically-typed Languages to Java. 14th Intl. Conf. on Managed Languages & Runtimes (ManLang'17), Prague, Czech Republic, Sept. 27-29, 2017, pp.12-22.

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(14) Mössenböck, H.: *Reflection using Hierarchical Iterators*. Talk at the Dagstuhl Seminar 451 on Effective Implementation of Object-Oriented Programming Languages, Nov.6-10, 2000.

(13) Mössenböck, H.: *Adding Static Single Assignment Form and a Graph Coloring Register Allocator to the Java Hotspot Client Compiler*. Report 15, University of Linz, Institute of Practical Computer Science, November 2000

(12) Steindl, C.; Mössenböck, H.: *Metaprogramming Facilities in Oberon for Windows and Power Macintosh*. Report 8, University of Linz, Institute of Practical Computer Science, July 1996

(11) Mössenböck, H.; Koskimies, K.: *Visualisierung objektorientierter Programme durch Ereignisdiagramme*. INFORMATIK/INFORMATIQUE 3/96.

(10) Koskimies, K.; Mössenböck, H.: *Scenario-Based Browsing of Object-Oriented Systems*. Report 4, University of Linz, Institute of Practical Computer Science, August 1995

(9) Mössenböck, H.; Koskimies, K.: *Active Text for Structuring and Understanding Source Code*. Report 3, University of Linz, Institute of Practical Computer Science, August 1995

(8) Koskimies, K.; Mössenböck, H.: *Designing a Framework for Language Implementation*. Report 2, University of Linz, Institute of Practical Computer Science, January 1995

(7) Mössenböck, H.: *Ein Programmeditor mit Hypertext-Fähigkeiten*. Informatik Fachberichte 249. Springer-Verlag.

(6) Mössenböck, H.: *The Programming Language Oberon-2*. Report 160, Department of Computer Science, ETH Zurich, May 1991

(5) Mössenböck, H.: *Erweiterbarkeit und Wiederverwendbarkeit von Software*. Technische Rundschau, TR 7, Feb.1990

(4) Mössenböck, H.: *She - A Simple Hypertext Editor for Programs*. Report 145, Department of Computer Science, ETH Zurich, December 1990

(3) Mössenböck, H.: *Coco/R - A Generator for Fast Compiler Front-Ends*. Report 127, Department of Computer Science, ETH Zurich, February 1990

(2) Mössenböck, H.; Templ, J.; Griesemer, R.: *Object Oberon - An Object-Oriented Extension of Oberon*. Report 109, Department of Computer Science, ETH Zurich, June 1989

(1) Mössenböck, H.: *Alex - A Simple and Efficient Scanner-Generator*. SIGPLAN-Notices, Vol.21, No 5, May 1986.

A.4 Supervised PhD Theses

As a Main Examiner

(35) Raphael Mosaner: Machine-Learning-Based Optimization Heuristics in Dynamic Compilers, JKU Linz, 2023. *promotio sub auspiciis praesidentis rei publicae*

(34) Andreas Schörgenhumer: Data Analysis and Error Analytics in Large-Scale Heterogeneous Software Systems, JKU Linz, 2023. *promotio sub auspiciis praesidentis rei publicae*

(33) Oliver Krauss: Pattern Mining and Genetic Improvement in Compilers and Interpreters, JKU Linz, 2022

(32) Markus Weninger: Detection and Analysis of Memory Anomalies in Managed Languages Using Trace-Based Memory Monitoring, JKU Linz, 2021

(31) David Leopoldseder: Simulation-Based Code Duplication in a Dynamic Compiler, JKU Linz, 2019

(30) Benoit Daloze: Thread-safe and Efficient Data Representations in Dynamically-typed Languages, JKU Linz, 2019

(29) Manuel Rigger: Safe and Efficient Execution of LLVM-based Languages, JKU Linz, 2018

(28) Josef Eisl: Trace Register Allocation, JKU Linz, 2018

(27) Philipp Lengauer: Accurate and Efficient Memory Monitoring in Virtual Machines, JKU Linz, 2017.

(26) Peter Hofer: Method Profiling and Lock Contention Profiling on the Java Virtual Machine Level, JKU Linz, 2016.

(25) Gilles Duboscq: Combining Speculative Optimizations with Flexible Scheduling of Side-effects, JKU Linz, 2016.

(24) Matthias Grimmer: Cross-language Interoperability in a Multi-language Virtual Machine, JKU Linz, 2015.

(23) Christian Häubl: Generalized Trace Compilation for Java, JKU Linz, 2015.

(22) Markus Jahn: Plugin-based Distributed Multi-user Web Applications, JKU Linz, 2014.

(21) Lukas Stadler: Partial Escape Analysis and Scalar Replacement for Java, JKU Linz, 2014.

(20) Roland Schatz: Trace-based Testing of Multi-threaded Reactive Systems, JKU Linz, 2013. *promotio sub auspiciis praesidentis rei publicae*

(19) Christian Wirth: Dynamic Analysis of Multi-threaded Real-time PLC Applications using Record and Replay, JKU Linz, 2013.

(18) Markus Löberbauer: Testing and Debugging of Dynamically Composed Applications, JKU Linz, 2012.

(17) Thomas Würthinger: Dynamic Code Evolution for Java. JKU Linz, 2011. *promotio sub auspiciis praesidentis rei publicae*

(16) Gerolf Hoflehner: Register Allocation for the Intel® Itanium® Processor Family. JKU Linz, 2010.

(15) Reinhard Wolfinger: Dynamic Application Composition with Plux.NET. JKU Linz, 2010.

(14) Dominik Hurnaus: Semantic Assistance for Industrial Automation Based on Contracts and Verification. JKU Linz, 2009.

(13) Leo Savernik: Automatic Elimination of Cycles in Software Systems, JKU Linz, 2008.

(12) Iris Groher: Aspect-oriented Product Line Engineering. JKU Linz, 2008.

(11) Christian Wimmer: Object and Array Inlining in the HotSpot Virtual Machine. JKU Linz, 2008.

(10) Thomas Kotzmann: Escape Analysis in the Context of Dynamic Compilation and Deoptimization. JKU Linz, 2005, *promotio sub auspiciis praesidentis rei publicae*

(9) Wolfgang Beer: Supporting Context Awareness in Highly Dynamic Network Environments. JKU Linz, 2004

(8) Gerhard Schaber: Dynamic Ordered Inheritance and Flexible Method Dispatch, JKU Linz, 2003

(7) Dietrich Birngruber: Concepts and Tools for Software Composition. JKU Linz, 2002

(6) Markus Hof: Composable Message Semantics for Object-oriented Programming Languages. JKU Linz, 2000.

(5) Christoph Steindl: Program Slicing for Object-oriented Programming Languages. JKU Linz, 1999

(4) Markus Knasmüller: On Adding Database Functionality to an Object-oriented Development Environment, JKU Linz, 1997

(3) Marc Brandis: Optimizing Compilers for Structured Programming Languages, ETH Zürich, 1995

(2) Josef Templ: Metaprogramming in Oberon, ETH Zürich, 1994

(1) Robert Griesemer: A Programming Language for Vector Computers, ETH Zürich, 1993

As a Co-examiner

(22) Remi Meier: A High-Performance, Parallel Virtual Machine for Python, ETH Zurich, 2019

(21) Roman Froschauer: A Dynamic Software Product Line Approach for Adaptive Automation Systems, JKU Linz, 2010.

(20) Oliver Lampl: Multimedia C#. Support of QoS-Aware and Adaptive Programming by Extending a General Purpose Programming Language, University of Klagenfurt, 2010.

(19) Peter Praxmarer: A Highly Responsive Grid Architecture for Short-running Jobs. JKU Linz, 2009.

(18) Deepak Dhungana: A Variable Approach to Variability Management. JKU Linz, 2009.

(17) Thomas Scheidl: Concepts for Efficient Implementation of Highly Dynamic Object-oriented Programming Languages, JKU Linz, 2005

(16) Ulrich Hirnschrott: Compilation Techniques for Reducing Energy Consumption of Embedded Digital Signal Processors, Technical University Vienna, 2005

(15) Josef Pichler: Deployment komponentenbasierter Softwaresysteme, JKU Linz, 2004

(14) Bruno Achauer: Distributed Objects in Heterogeneous Environments, JKU Linz, 2000

(13) Wolfgang Narzt: Design Patterns for Process Automation Systems, JKU Linz, 2000

(12) Jason R.C. Patterson: VGO - A Very Global Optimizer, Queensland University of Technology, Brisbane, 2000

(11) Glenn Smith: Conciliation: The Adaptation of Independently Developed Software Components, Queensland University of Technology, 1999.

(10) Joachim Hans Fröhlich: Hypothesengesteuerte Analyse von Objektarchitekturen. JKU Linz, 1999.

(9) Daniel Scherer: Internet-wide Software Component Development Process and Deployment Integration, ETH Zürich, 1998.

(8) Kim Elms: Debugging Optimised Code Using Function Interpretation, Queensland University of Technology, 1998

(7) Hans Bärfuss: Teilautomatische Herstellung von Codegeneratoren für Mikrocontroller. ETH Zürich, 1994.

(6) Reto Marti: GIPSY: Ein Ansatz zum Entwurf integrierter Software-Entwicklungswerkzeuge. ETH Zürich, 1994.

(5) Regis Crelier: Separate Compilation and Module Extension. ETH Zürich, 1994.

(4) Clemens A. Szyperski: Insight ETHOS: On Object-Orientation in Operating Systems, ETH Zürich, 1992

(3) Peter R Lamb: Object-Oriented Techniques for Mixed-Mode Circuit Simulation, ETH Zürich, 1991

(2) Anders Kierulf: Smart Game Board: A Workbench for Game-Playing Programs, with Go and Othello as Case Studies, ETH Zürich, 1990

(1) Martin Odersky: A New Approach to Formal Language Definition and its Application to Oberon, ETH Zürich, 1989

B TEACHING

B.1 University Courses

Most courses were given several times at JKU Linz, at the University of Zurich, at ETH Zurich, at the Oxford Brookes University and at the University of Budapest. Currently I teach courses on "Introduction to Programming", "Object-oriented Programming", "Compiler Construction", "System Software" and "Software Development with C#".

- *Grundlagen der Programmierung* (Introduction to Programming)
  Softwareentwicklung 1 (Software Development 1)
  - JKU Linz, 2 hours lecture, 2 hours lab

- *Objektorientierte Programmierung* (Object-Oriented Programming)
  Softwareentwicklung 2 (Software Development 2)
  - JKU Linz, 2 hours lecture, 2 hours lab
  - ETH Zürich, 2 hours lecture, 1 hours lab

- *Algorithmen und Datenstrukturen* (Algorithms and Data Structures)
  - JKU Linz, 2 hours lecture, 2 hours lab
  - University of Zurich, 4 hours

- *Compilerbau I* (Compiler Construction I)
  - JKU Linz, 2 hours lecture, 2 hours lab
  - Oxford Brookes University, 2 hours lecture plus lab
  - ETH Zürich, 2 hours lecture, 1 hour lab

- *Compilerbau II* (Compiler Construction II)
  Advanced Compiler Construction
  - JKU Linz, 2 hours lecture with lab
  - ETH Zürich, 2 hours lecture, 1 hours lab

- *LR-Syntaxanalyse* (LR Syntax Analysis)
  - JKU Linz, 1 hour lecture

- *Prinzipien von Programmiersprachen* (Principles of Programming Languages)
  Together with G.Blaschek and H.Prähofer
  - JKU Linz, 3 hours lecture with lab

- *System Software*
  - JKU Linz, 2 hours lecture
  - ETH Zürich, 3 hours lecture, 2 hours lab

- *Betriebssysteme 2* (Operating Systems 2)
  - JKU Linz, 2 hours lecture

- *Mikrocomputertechnik* (Microcomputer Technology)
  - JKU Linz, 2 hours lecture with lab

- *Softwareentwicklung mit C#* (Software Development with C#)
  - JKU Linz, 1 hour lecture with lab

- *Die .NET-Technologie* (The .NET Technology)
  - JKU Linz, 2 hours lecture with lab

- *Einführung in das Software-Engineering* (Introduction to Software Engineering)
  - University of Zurich, 4 hours lecture, 2 hours lab
  - ETH Zurich, 2 hours lecture, 1 hour lab

- Seminars on
  - *Garbage Collection*
  - *Distributed Operating Systems*
  - *History of Programming Languages*
  - *Web Programming*
  - *.NET Programming*
  - *Programming Style*

B.2 Courses for Industry

- The .NET Technology (1.5 days)
- Testing of Software Systems (1.5 days)
- Web Programming (1.5 days)
- Do you speak Java? Software Development for the Web (1 day).
- Oberon: Simplicity + Extensibility = Power (1 day)
- Object-Oriented Programming (3 days)
- Algorithms and Data Structures (1 day)
- Compiler Construction (1 day)

C ADMINISTRATION

C.1 Academic Duties

- Head of the Academic Senate at the Johannes Kepler University Linz. 2019-2022
- Member of the Academic Senate at the Johannes Kepler University Linz, 2015-2022
- Member of the University Council (Universitätsrat) of the Technical University Graz, 2008-2018
- Head of the Institute for System Software, JKU, 2004-
- Head of the Christian Doppler Laboratory for Automated Software Engineering, JKU, 2006-2013
- Head of the Curriculum Committee for Computer Science at the Johannes Kepler University Linz (Studienkommission Informatik), 2002-
- Member of the JKU Curriculum Planning Committee (CPK) at JKU, 2017- 2019
- Member and head of several professorship appointment committees and habilitation committees.

C.2 Local Coordinator for Mobility Programs

- CEEPUS II Network: Student and staff exchange program with the following partners:
  - Eötvös Loránd University Budapest (H)
  - University of Szeged (H)
  - Johannes Kepler University Linz (A)
  - University of Klagenfurt (A)
  - Babes Bolyai University of Cluj-Napoca (RO)
  - Paissi Hilendarski University of Plovdiv (BG)
  - Constantine the Philosopher University in Nitra (SK)
  - Technical University in Kosiče (SK)
  - Polytechnical Engineering College Subotica (SR)

- ERASMUS student and staff exchange program with the following universities
  - Oxford Brookes University (UK)
  - ETH Zurich (CH)
  - TU Delft (NL)
  - University of Groningen (NL)
  - University of Bradford (UK)
  - University of Helsinki (FIN)
  - University of Tampere (FIN)
  - Eötvös Loránd University Budapest (H)

C.3 Other Professional Activities

Editorship

- Journal of Object Technology (Editorial board member)
- Informatica – Acta Universitatis Sapientiea (Ediorial board member)

Organisation of Conferences and Tutorial Programs

- Member of the Steering Committee of MPLR (Intl. Conf. on Managed Programming Languages and Runtimes, 2018-2022 (head 2021-2022)
- Conference Chair at ManLang'18 (15th Intl. Conf. on Managed Languages & Runtimes) in Linz, Austria
- Workshop Co-chair at ICPE'17 (Intl. Conf. of Performance Engineering) in L'Aquila, Italy
- Program Chair at PPPJ'10 (Principles and Practice of Programming in Java) in Vienna, Austria
- Tutorial Co-Chair at ECOOP'04 in Oslo, Norway
- Tutorial Co-Chair at ECOOP'02 in Malaga, Spain
- Program Chair at JMLC'97 (Joint Modular Languages Conference) in Linz, Austria
- Tutorial Chair at ECOOP'96 (European Conference on Object-Oriented Programming) in Linz, Austria

Program Committee Member

- ASE (Automated Software Engineering): 2004
- CACM Special Issue of Application Frameworks, 1997
- DLS (Dynamic Languages Symposium): 2018
- ECOOP (European Conference on Object-Oriented Programming): 1999
- EMISA (Entwicklungsmethoden f. Informationssysteme u. deren Anwend.): 1996
- ESEC (European Software Engineering Conference): 1997, 1999
- ICPE (Intl. Conf. on Performance Engineering): 2020, 2022
- JCKBSE (Joint Conf. on Knowledge-based Software Engineering): 2000, 2002
- JMLC (Joint Modular Languages Conference): 1994, 1997, 2000, 2003, 2006
- Joint Conference on Knowledge-Based Software Engineering: 2000, 2002
- LSSC (Intl. Workshop on Large-scale Software Composition): 1998
- ManLang (Managed Languages & Runtimes): 2017
- MPLR (Managed Programming Languages and Runtimes): 2020
- Onward! Essays: 2022
- Pervasive (Conference on Pervasive Computing): 2007
- PLDI (Programming Languages Design and Implementation), external reviewer: 2009, 2011, 2012, 2013, 2014
- PLSA (Programming Languages and System Architectures): 1996
- PPPJ (Principles and Practice of Programming in Java): 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016
- PSI (Perspectives of System Informatics): 1998, 1999, 2001, 2003, 2006, 2009, 2011
- SAC (Symposium on Applied Computing): 2012, 2013
- SOFSEM (Software Seminar of Czech and Slovak Computer Society): 1997, 1998
- SPLASH Onward! Essays: 2022
- SPLST (Symposium on Programming Languages and Software Tools): 2009

- TARA (Int.Conf. on Theoretical Aspects of Computer Science): 1999
- TOOLS (Technology of OO Languages and Systems): 1990, 1991, 1992, 1993
- VEE (Virtual Execution Environments): 2006
- WAPL (Workshop on Advances in Programming Languages): 2011, 2013, 2015, 2017
- WGT (Workshop on Generative Techniques): 2008, 2009, 2010

Reviewer for Journals

- IEEE Transactions on Dependable and Secure Computing
- IEEE Transactions on Software Engineering
- Journal of Object Technology
- Journal of Systems and Software
- Journal of Systems Architecture
- Microprocessing and Microprogramming
- Science of Computer Programming
- Software — Concepts and Tools
- Software — Practice and Experience
- TOPLAS — ACM Transactions on Programming Languages and Systems

Reviewer of Research Proposals

- DFG Proposal FOR 5549/0 on Serverless Scientific Computing, 2022
- Swiss National Science Foundation, Proposal PZ00P2_168016, 2016
- Czech Science Foundation, 2012
- Swiss National Science Foundation, Proposal 200021-121904, 2008
- Swiss National Science Foundation, Proposal PE002—117127, 2007
- Swiss National Science Foundation, Proposal 200020-113342, 2006
- Netherlands Organization for Scientific Research, Proposal 600.065.120.04N08, 2004
- Swiss National Science Foundation, Proposal 2000-67855.02, 2002
- Swiss National Science Foundation, Proposal 2000-61655.00, 2000
- "Jubiläumsfonds der österreichischen Nationalbank", Proposal 7845, 1999
- FWF Proposal P10188-MAT, 1998
- FWF Proposal P11340-ÖMA, 1996
- FWF Proposal ProCoS, 1993
- FWF Proposal Multimedia Database, 1991

Peer Reviews

- Review of the IT system of the University of Vienna, 2018
- Reviewer for the promotion of an Associate Professor to a Full Professor, Charles University Prague, 2018
- Review of an OeAD proposal on "Lossless Compaction of Model Execution Traces", 2017
- Reviewer for the position of a full professor for "Informatik - Programmiersprachen" at the University of Innsbruck, 2005
- Head of the AQAS accreditation committee for the curriculum "Informatik" at the University of Düsseldorf, Germany, 2003
- Member of the Swiss Peer Review Group for the evaluation of the "Fachhochschule Rapperswil", Switzerland, 2001

Professorship Appointment Committees

- Head of the appointment committee for a tenure track position on "Open Digital Education" at JKU Linz, 2022
- Head of the appointment committee for the professorship "Engineering of Software-intensive Systems" at JKU Linz, 2007.
- Head of the appointment committee for a professorship in Computer Science (Praktische Informatik) at JKU Linz, 1999
- Member of several professorship appointment committees at JKU Linz:
  - Instructional Technologies, 2019
  - Secure Systems, 2019
  - Netzwerke und Sicherheit, 2013
  - Computergraphik, 2007
  - Angewandte Informatik, 2005
  - Bioinformatik, 2003
  - Biophysik, 2002
  - Rechnerarchitekturen, 2009
  - Symbolic Computation, 1998

Other Committees

- Member of the Advisory Board of the European Forum Alpbach, 2013 - 2017.