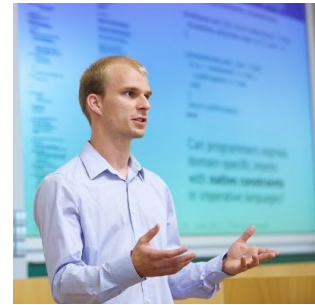


# Tim FELGENTREFF

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## Profile

I am a member of the Truffle/Graal team at Oracle Labs. I was led here by my interests in programming languages and virtual machine design, and my involvement with the PyPy/RPython project and various other dynamic language VMs. My work revolves around dynamic language interoperability, connecting them with native C code in a safe manner, and providing cross-language tool support. I also continue to collaborate with the Hasso Plattner Institute at the University of Potsdam. I run 10km in less than 50 minutes.

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## Education

- 2012-2017 **Dr.rer-nat.**, *Hasso Plattner Institute, University of Potsdam, Potsdam, Germany*  
grade: summa cum laude  
advisor: Robert Hirschfeld, Hasso Plattner Institute, University of Potsdam  
additional reviewers:  
Wolfgang de Meuter, Vrije Universiteit Brussel  
Alan Kay, Viewpoints Research Institute  
In my thesis I presented Babelsberg, a formal design with multiple implementations for object-constraint programming to integrate constraint declaration and continuous satisfaction with mutable object-oriented structures and behavior.  
*Doctoral Thesis* The Design and Implementation of Object-Constraint Programming
- 2010-2012 **M.Sc.**, *Hasso Plattner Institute, University of Potsdam, Potsdam, Germany*  
final grade: 1.0 (A+)  
During my master's studies, I focused on programming language concepts to facilitate development tools, end-user programming, modularity, and meta-circularity especially in distributed and parallel programming settings.  
*Master's Thesis* Comparison, Replay, and Refinement of Communication Traces for Debugging Distributed Failures
- 2007-2010 **B.Sc.**, *Hasso Plattner Institute, University of Potsdam, Potsdam, Germany*  
final grade: 1.4 (A)  
*Bachelor's Thesis* Post-mortem Analysis of Debug Traces
- 2005-2007 **Abitur**, *Pückler Grammar School, Cottbus, Germany*  
final grade: 1.0 (A+)
- 2004-2005 **AS-level studies**, *Budehaven Community College, Bude, England*
- 2000-2004 **GCSE-level studies**, *Heinrich-Heine Grammar School, Cottbus, Germany*

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## Experience


- July 2017-present **Senior Software Engineer**, *Oracle Labs Germany*, Potsdam, Germany  
At Oracle Labs I am a member of the Truffle/Graal group working on virtual machine technology for dynamic languages.
- Apr 2016-June 2017 **Research Assistant**, *Hasso Plattner Institute, University of Potsdam*, Potsdam, Germany  
My research focused on novel programming paradigms, virtual machines for dynamic programming languages, and end-user programming with a special interest in computer science education for children.
- Oct 2012-Apr 2016 **Ph.D. Student**, *Hasso Plattner Institute, University of Potsdam*, Potsdam, Germany  
My Ph.D. research focused on object-constraint programming, a novel approach at combining constraint solvers with dynamic, object-oriented languages in a clean and powerful way.
- Oct 2014-Dez 2014 **Research Visit**, *Nanjing University*, Nanjing, China  
At Nanjing University I collaborated with researchers on emotion analysis in Twitter-like social networks.
- Feb 2010-Oct 2012 **Working Student**, *Finn GmbH*, Berlin, Germany  
At Finn GmbH I was involved in plugin development for Redmine.
- Oct 2009-Oct 2012 **Working Student**, *Hasso Plattner Institute*, Potsdam, Germany  
I was a tutor at the Software Architecture Group, assisting the staff with undergraduate lectures on software engineering and software development methodologies, using Squeak/Smalltalk as the educational language.
- Aug 2011-Nov 2011 **Intern**, *VMware*, Beaverton, OR, USA  
At VMware I was working on the MagLev Ruby VM built on top of the distributed GemStone/S Smalltalk object database system.
- May 2010-Aug 2010 **Ruby Summer of Code Participant**  
As part of the 2010 Ruby Summer of Code, I built out prototype work by Wayne Meissner to add support for Ruby C extensions to JRuby.


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## Skills


*Languages* German - native proficiency  
English - full professional proficiency  
French - limited working proficiency  
Mandarin - rudimentary knowledge


*Software Projects*  Babelsberg - a family of object-constraint languages


 RSqueakVM - a research Squeak/Smalltalk VM written in RPython


*Core Contributions*  Python on GraalVM - an implementation of Python 3 for the GraalVM


 Squeak - a modern implementation of Smalltalk-80


 JRuby - an industry-grade Ruby implementation on the JVM

 Topaz - an experimental Ruby implementation written in RPython

 MagLev - a Ruby implementation on top of the GemStone/S object-database

 PyPy - a fast Python implementation with a tracing just-in-time compiler

 Lively Kernel - a self-supporting development environment on a Web page

 Stratagus - a real-time 2d strategy game engine

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## Publications

Clément Béra, Eliot Miranda, Tim Felgentreff, Marcus Denker, and Stéphane Ducasse. “**Sista: Saving Optimized Code in Snapshots for Fast Start-up**”. In *Proceedings of the 14th International Conference on Managed Languages and Runtimes, ManLang 2017, Prague, Czech Republic, September 27 - 29, 2017*, 1–11, 2017. doi: 10.1145/3132190.3132201 <https://doi.org/10.1145/3132190.3132201>.

Tim Felgentreff. “**Checks and Balances: Object-Constraints Without Surprises**”. In *Proceedings of the 9th Ph.d. Retreat of the HPI Research School on Service-Oriented Systems Engineering*. Tech. rep. 100. Hasso Plattner Institute, 2016.

Tim Felgentreff. “**Implementing an Object-Constraint Extension Without VM Support**”. In *Proceedings of the 8th Ph.d. Retreat of the HPI Research School on Service-Oriented Systems Engineering*. Tech. rep. 95. Hasso Plattner Institute, 2015.

Felgentreff, Tim, ed. **Proceedings of the 14th ACM SIGPLAN International Symposium on Dynamic Languages, DLS 2018, Boston, MA, USA, November 6, 2018**. ACM, 2018. doi: 10.1145/3276945 <https://doi.org/10.1145/3276945>.

Tim Felgentreff. “**Specifying Multi-Domain Constraints on Object-Behavior**”. In *Proceedings of the 7th Ph.d. Retreat of the HPI Research School on Service-Oriented Systems Engineering*. Tech. rep. 83. Hasso Plattner Institute, 2014.

Tim Felgentreff. “**The Design and Implementation of Object-Constraint Programming**”. PhD thesis, University of Potsdam, Germany, 2017 <http://d-nb.info/1136085963>.

Felgentreff, Tim, and Olivier Zendra, eds. **Proceedings of the 13th Workshop on Implementation, Compilation, Optimization of Object-Oriented Languages, Programs and Systems, ICPOOLPS@ECOOP 2018, Amsterdam, Netherlands, July 16-21, 2018**. ACM, 2018. doi: 10.1145/3242947 <https://doi.org/10.1145/3242947>.

Tim Felgentreff, Alan Borning, and Robert Hirschfeld. “**Babelsberg: Specifying and Solving Constraints on Object Behavior**”. Tech. rep. 2013-001. Viewpoints Research Institute, May 2013.

Tim Felgentreff, Alan Borning, and Robert Hirschfeld. “**Specifying and Solving Constraints on Object Behavior**”. *Journal of Object Technology (JOT)* 13, no. 4 (2014): 1–38. doi: 10.5381/jot.2014.13.4.a1.

Tim Felgentreff, Alan Borning, Robert Hirschfeld, Jens Lincke, Yoshiki Ohshima, Bert Freudenberg, and Robert Krahn. “**Babelsberg/JS: a Browser-Based Implementation of an Object Constraint Language**”. In *ECOOP*, 411–36. Springer, 2014. doi: 10.1007/978-3-662-44202-9\_17.

Tim Felgentreff, Robert Hirschfeld, Alan Borning, and Millstein Todd. “**Babelsberg/RML: Executable Semantics and Language Testing with RML**”. Tech. rep. 103. Hasso Plattner Institut, 2016.

Tim Felgentreff, Robert Hirschfeld, Maria Graber, Alan Borning, and Hidehiko Masuhara. “**Declaring Constraints on Object-Oriented Collections**”. *Journal of Information Processing* 24, no. 6 (2016): 917–27. doi: 10.2197/ipsjip.24.917.

Tim Felgentreff, Stefan Lehmann, Robert Hirschfeld, Sebastian Gerstenberg, Jakob Reschke, Lars Rückert, Patrick Siegler, Jan Graichen, Christian Nicolai, and Malte Swart. “**Automatically Selecting and Optimizing Constraint Solver Procedures for Object-Constraint Languages**”. In *Constrained and Reactive Objects Workshop (CROW)*, 65–72. MODULARITY Companion 2016. ACM, 2016. doi: 10.1145/2892664.2892671.

Tim Felgentreff, Jens Lincke, Robert Hirschfeld, and Lauritz Thamsen. “**Lively Groups: Shared Behavior in a World of Objects Without Classes or Prototypes**”. In *Future Programming Workshop (FPW)*, 15–22. ACM, 2015. doi: 10.1145/2846656.2846659.

Tim Felgentreff, Todd Millstein, and Alan Borning. “**Developing a Formal Semantics for Babelsberg: a Step-by-Step Approach**”. Tech. rep. 2014-002. Viewpoints Research Institute, September 2014.

Tim Felgentreff, Todd Millstein, Alan Borning, and Robert Hirschfeld. “**Checks and Balances — Constraint Solving Without Surprises in Object-Constraint Programming Languages: Full Formal Development**”. Tech. rep. 2015-001. Viewpoints Research Institute, 2015.

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Tim Felgentreff, Fabio Niephaus, Tobias Pape, and Robert Hirschfeld. “**When a Mouse Eats a Python: Smalltalk-Style Development for Python and Ruby**”. In *Workshop on Modern Language Runtimes, Ecosystems, and VMs (MoreVMs)*, 2017.

Tim Felgentreff, Tobias Pape, Robert Hirschfeld, Anton Gulenko, and Carl Friedrich Bolz. “**Language Independent Storage Strategies for Tracing JIT Based VMs**”. In *Proceedings of the 11th ACM Symposium on Dynamic Languages*, 119–28. DLS ’15. ACM, 2015. doi: 10.1145/2816707.2816716.

Tim Felgentreff, Tobias Pape, Patrick Rein, and Robert Hirschfeld. “**How to Build a High-Performance VM for Squeak/Smalltalk in Your Spare Time: an Experience Report of Using the RPython Toolchain**”. In *Proceedings of the 11th Edition of the International Workshop on Smalltalk Technologies*, 21:1–21:10. IWST’16. ACM, 2016. doi: 10.1145/2991041.2991062. BEST PAPER AWARD.

Tim Felgentreff, Tobias Pape, Lars Wassermann, Robert Hirschfeld, and Carl Friedrich Bolz. “**Towards Reducing the Need for Algorithmic Primitives in Dynamic Language VMs Through a Tracing JIT**”. In *Proceedings of the 10th Workshop on Implementation, Compilation, Optimization of Object-Oriented Languages, Programs and Systems*, 7:1–7:10. ICPOOLPS’15. ACM, 2015. doi: 10.1145/2843915.2843924.

Tim Felgentreff, Michael Perscheid, and Robert Hirschfeld. “**Constraining Timing-Dependent Communication for Debugging Non-Deterministic Failures**”. In *Proceedings of the Workshop on Academic Software Development Tools and Techniques*. WASDeTT’13, 2013.

Tim Felgentreff, Michael Perscheid, and Robert Hirschfeld. **“Implementing Record and Refinement for Debugging Timing-Dependent Communication”**. *Science of Computer Programming (SCICO)* 134 (2017): 4–18. doi: 10.1016/j.scico.2015.11.006.

Bert Freudenberg, Dan H.H. Ingalls, Tim Felgentreff, Tobias Pape, and Robert Hirschfeld. **“SqueakJS: a Modern and Practical Smalltalk That Runs in Any Browser”**. In *Proceedings of the 10th ACM Symposium on Dynamic Languages*, 57–66. DLS’14. ACM, 2014. doi: 10.1145/2661088.2661100.

Maria Graber, Tim Felgentreff, Robert Hirschfeld, and Alan Borning. **“Solving Interactive Logic Puzzles with Object-Constraints — an Experience Report Using Babelsberg/S for Squeak/Smalltalk”**. In *Workshop on Reactive and Event-Based Languages & Systems (REBLS)*, 2014.

Johannes Henning, Tim Felgentreff, and Robert Hirschfeld. **“VM Wrapping: Fake It till You Make It”**. In *Proceedings of the 12th Workshop on Implementation, Compilation, Optimization of Object-Oriented Languages, Programs and Systems, ICPOOLPS@ECOOP 2017, Barcelona, Spain, June 19, 2017*, 2:1–4, 2017. doi: 10.1145/3098572.3098576 <https://doi.org/10.1145/3098572.3098576>.

Eva-Maria Herbst, Fabian Maschler, Fabio Niephaus, Max Reimann, Julia Steier, Tim Felgentreff, Jens Lincke, Marcel Taeumel, Robert Hirschfeld, and Carsten Witt. **“EcoControl: Entwurf Und Implementierung Einer Software Zur Optimierung Heterogener Energiesysteme in Mehrfamilienhäusern”**. Tech. rep. 93. Hasso Plattner Institute, 2015.

Robert Hirschfeld, Hidehiko Masuhara, Atsushi Igarashi, and Tim Felgentreff. **“Visibility of Context-Oriented Behavior and State in L”**. *Journal of the Japan Society for Software Science and Technology (JSSST)* 32, no. 3 (2015): 149–59.

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Daniel Ingalls, Tim Felgentreff, Robert Hirschfeld, Robert Krahn, Jens Lincke, Marko Röder, Antero Taivalsaari, and Tommi Mikkonen. **“A World of Active Objects for Work and Play: the First Ten Years of Lively”**. In *Proceedings of the 2016 ACM International Symposium on New Ideas, New Paradigms, and Reflections on Programming and Software*, 238–49. Onward! 2016. ACM, 2016. doi: 10.1145/2986012.2986029.

Bastian Kruck, Stefan Lehmann, Christoph Kessler, Jakob Reschke, Tim Felgentreff, Jens Lincke, and Robert Hirschfeld. **“Multi-Level Debugging for Interpreter Developers”**. In *Workshop on Language Modularity a La Mode (LaMOD)*, 91–93. MODULARITY Companion 2016. ACM, 2016. doi: 10.1145/2892664.2892679.

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Stefan Lehmann, Tim Felgentreff, and Robert Hirschfeld. **“Connecting Object Constraints with Context-Oriented Programming: Scoping Constraints with Layers and Activating Layers with Constraints”**. In *Proceedings of the 7th International Workshop on Context-Oriented Programming*, 1–6. COP’15. ACM, 2015. doi: 10.1145/2786545.2786549.

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Jens Lincke, Patrick Rein, Stefan Ramson, Robert Hirschfeld, Marcel Taeumel, and Tim Felgentreff. **“Designing a Live Development Experience for Web-Components”**. In *Proceedings of the 3rd ACM SIGPLAN International Workshop on Programming Experience, PX/17.2, Vancouver, BC, Canada, October 23-27, 2017*, 28–35, 2017. <https://dl.acm.org/citation.cfm?id=3167109>.

Fabio Niephaus, Tim Felgentreff, and Robert Hirschfeld. **“GraalSqueak: A Fast Smalltalk Bytecode Interpreter Written in an AST Interpreter Framework”**. In *Proceedings of the 13th Workshop on Implementation, Compilation, Optimization of Object-Oriented Languages, Programs and Systems, ICPOOLPS@ECOOP 2018, Amsterdam, Netherlands, July 16-21, 2018*, edited by Tim Felgentreff and Olivier Zendra, 30–35. ACM, 2018. doi: 10.1145/3242947.3242948 <https://doi.org/10.1145/3242947.3242948>.

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Fabio Niephaus, Tim Felgentreff, Tobias Pape, Robert Hirschfeld, and Marcel Taeumel. **“Live Multi-Language Development and Runtime Environments”**. *Programming Journal* 2, no. 3 (2018): 8. doi: 10.22152/programming-journal.org/2018/2/8 <https://doi.org/10.22152/programming-journal.org/2018/2/8>.

Fabio Niephaus, Dale Henrichs, Marcel Taeumel, Tobias Pape, Tim Felgentreff, and Robert Hirschfeld. “**SmalltalkCI: a Continuous Integration Framework for Smalltalk Projects**”. In *Proceedings of the 11th Edition of the International Workshop on Smalltalk Technologies*, 1–9. IWST’16. ACM, 2016. doi: 10.1145/2991041.2991044.

Fabio Niephaus, Matthias Springer, Tim Felgentreff, Tobias Pape, and Robert Hirschfeld. “**Call-Target-Specific Method Arguments**”. In *Proceedings of the 10th Workshop on Implementation, Compilation, Optimization of Object-Oriented Languages, Programs and Systems*, 5:1–:4. ICPOOLPS’15. ACM, 2015. doi: 10.1145/2843915.2843919.

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Michael Perscheid, Tim Felgentreff, and Robert Hirschfeld. “**Follow the Path: Debugging State Anomalies Along Execution Histories**”. In *Software Maintenance, Reengineering and Reverse Engineering (CSMR-WCRE), 2014 Software Evolution Week - IEEE Conference on*, 124–33. IEEE, 2014. doi: 10.1109/CSMR-WCRE.2014.6747162.

Patrick Rein, Stefan Ramson, Jens Lincke, Tim Felgentreff, and Robert Hirschfeld. “**Group-Based Behavior Adaptation Mechanisms in Object-Oriented Systems**”. *IEEE Software* 34, no. 6 (2017): 78–82. doi: 10.1109/MS.2017.4121224 <https://doi.org/10.1109/MS.2017.4121224>.

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Philipp Tessenow, Tim Felgentreff, Gilad Bracha, and Robert Hirschfeld. “**Extending a Dynamic Programming Language and Runtime With Access Control**”. Tech. rep. 107. Hasso Plattner Institut, 2016.

Lars Wassermann, Tim Felgentreff, Tobias Pape, Carl Friedrich Bolz, and Robert Hirschfeld. “**Tracing Algorithmic Primitives in RSqueak/VM**”. Tech. rep. 104. Hasso Plattner Institut, 2016.

Christopher Weyand, Jonas Chromik, Lennard Wolf, Steffen Kötte, Konstantin Haase, Tim Felgentreff, Jens Lincke, and Robert Hirschfeld. “**Improving Hosted Continuous Integration Services**”. Tech. rep. 108. Hasso Plattner Institut, 2017.