Matthias Springer

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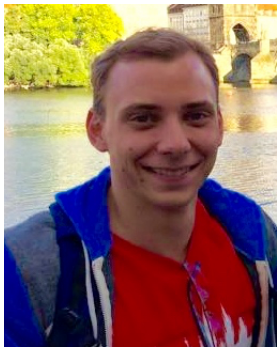
Coding: https://github.com/matthias-springer/



Profile

I am a first-year doctoral student in mathematical and computing sciences, interested in programming language design, modularity, virtual machines, execution environments, program transformation and optimization, compilers, web development, algorithm design and database query processing.

Personal Information

Born July 28, 1990, Freising, Germany.
Nationality German.
Languages German (native speaker), English (CEFR C1/C2, TOEFL iBT score 117/120).

Education

Since Oct. 2015 **Tokyo Institute of Technology (東京工業大学)**, *Meguro-ku, Tokyo, Japan*,
Programming Research Group, Department of Mathematical and Computing Sciences
PhD Candidate, Academic advisor: Prof. Hidehiko Masuhara.

Sept. 2014 - Sept. 2015 **Hasso Plattner Institute, University of Potsdam**, *Potsdam, Brandenburg, Germany*,
Master of Science, IT Systems Engineering, overall grade: 1.0 (A+).
- *Master's project:* Spur to go faster: Low-level Functionality in a High-level Language
- *Master's thesis:* Nested Class Modularity in Squeak/Smalltalk
  Thesis supervised by Prof. Dr. Robert Hirschfeld
- *Relevant coursework:* VMs and Execution Environments, Context-oriented Programming

Sept. 2013 - June 2014 **University of California, San Diego**, *La Jolla, CA, United States*,
Visiting student, Department of Computer Science and Engineering, GPA: 4.0, Provost's Honors.
- Full tuition and living expenses covered by *UC Education Abroad Program* and *DAAD Scholarship*
- *Relevant coursework:* Advanced Compilers (CSE 131/231), Programming Languages (CSE 130/230), Advanced Algorithms (CSE 190/202/203A), Database Analytics (CSE 190)

Aug. 2010 - July 2013 **Hasso Plattner Institute, University of Potsdam**, *Potsdam, Brandenburg, Germany*,
Bachlor of Science, IT Systems Engineering, overall grade: 1.0 (A+), rank 1-3/74.
- *Bachelor's project:* Evolving Applications: Object-migration with Ruby and GemStone
- *Bachelor's thesis:* Inter-language Collaboration in an Object-oriented Virtual Machine
  Project and thesis supervised by Prof. Dr. Robert Hirschfeld, Tim Felgentreff, Tobias Pape
- *Relevant coursework:* Software Architecture, Software Engineering I, Advanced Modularity, Database Systems I/II, Internet and WWW Technologies, Designing Interactive Systems (HCI)

Sept. 2000 - June 2009 **Josef-Hofmiller-Gymnasium**, *Freising, Bavaria, Germany*,
University entrance qualification (Abitur), overall grade: 1.7, rank 4/82.

German grading system: 1.0 is best possible, 4.0 is worst possible, 5.0 is failed.
Selected coursework and publications: `http://m-sp.org/`.

Research Experience

Since Oct. 2014 **Programming Languages**, *Hasso Plattner Institute / Tokyo Institute of Technology*,
Research with Prof. Hirschfeld and Prof. Masuhara.

- *Virtual Machines:* Worked on the rpython-based RSqueak VM; implemented low-level primitives in a high-level language, including a transparent language-to-VM-to-language dispatch mechanism. Implemented call-target-specific method arguments for the Truffle-based JRuby implementation.
- *Context-oriented Programming:* Worked on ContextAmber, a COP implementation for Amber Smalltalk. Implemented and evaluated concepts for partial method inlining and inlined layered method invalidation.
- *Modularity in OOP:* Designed and implemented the Matriona module system for Squeak/Smalltalk, based on a hierarchical name lookup mechanism and supporting class nesting/parameterization. Evaluated concepts for dependency/version management, mixin modularity, and class family inheritance.

March 2014 - Nov. 2014 **Relationship Queries**, *University of California, San Diego*,
Database research with Prof. Papakonstantinou and Chunbin Lin.
Evaluated algorithms and data structures for relationship queries in relational database systems, and compared them with latest column store techniques. Implemented the *FastR* database prototype.

May 2011 - Apr. 2013 **Student Research Assistant**, *Hasso Plattner Institute, Internet Technologies and Systems Group*.

- *SOA Security Lab:* A browser-based simulation system for modelling and executing SOA security scenarios. Worked on the Oryx Modelling Editor, developed a database backend with Grails and PostgreSQL, and integrated the system into an existing OpenNebula VM network.
- *tele-lab:* A hands-on system for teaching and simulating network security scenarios. Working on the user interface using Grails.

Work Experience

April 2012 - March 2015 **Hasso Plattner Institute**, *Potsdam, Germany*, Teaching Assistant.

- Mathematics II (Dr. habil. Börner)
- Software Architecture (Prof. Dr. Hirschfeld)
- Software Engineering I (Prof. Dr. Hirschfeld)

June 2014 - Sept. 2014 **Google Inc.**, *Boulder, CO, USA*, Software Engineering Intern.
Working on a business event process engine for an internal Google payments system, using Megastore, F1/Spanner, Java, and Guice.

Aug. 2012 - Oct. 2012 **Senacor Technologies AG**, *Munich, Germany*, Software Development Intern.
Developed software components and tests for a service-oriented environment in the financial sector, using Java EE, the Spring Framework, and Oracle database servers.

Aug. 2011 - Oct. 2011 **TNG Technology Consulting GmbH**, *Munich, Germany*, Software Development Intern.
Developed plugins for Atlassian JIRA/Confluence (Subversion commit monitor) and Hudson/Jenkins (job status monitor). Set up an LDAP server for user authentification for SSH and Atlassian JIRA/Confluence.

July 2005 **Rechenzentrum Garching (RZG) of the Max Planck Society**, *Munich, Germany*, Intern.

Projects

Sept. 2014 - July 2015 **ME310 Global Team-based Product Innovation & Engineering**,
course offered by Hasso Plattner Institute and Stanford University.
Working on a design challenge by Audi USA with Stanford mechanical engineering students. Developing and prototyping concepts for car-to-passenger and car-to-pedestrian communication in autonomous cars, using design thinking methods.

June 2013 - Sept. 2013 **Athens for Amber Smalltalk**, *Google Summer of Code 2013 Project*,
European Smalltalk User Group (ESUG), Mentors: Nicolas Petton, Igor Stasenko.
Implemented the Athens vector graphics library in Amber Smalltalk, a Smalltalk execution environment running entirely in the web browser, using HTML5 Canvas. Developed a Morphic-like framework for building user interfaces on top of Athens.

Dec. 2012 - June 2013 **MagLev Database Explorer**, *Part of Bachelor's project at HPI*.
An IDE running entirely in a web browser for exploring Ruby/Smalltalk objects persisted in a GemStone/S 64 image, writing Ruby/Smalltalk code, and debugging Rails/Sinatra applications interactively. Built with Amber Smalltalk, Ruby on Rails, and Twitter Bootstrap.

Achievements

Oct. 2015 - Sept. 2018 **Monbukagakusho (MEXT) Scholarship (文部科学省奨学金)**.
Japanese government scholarship for research students, covering tuition and living expenses.

Oct. 2014 - Sept. 2015 **Hasso Plattner Scholarship**.
One-year scholarship awarded to the best Bachelor graduates.

March 2015 **Media Hack Day Berlin**, *Second Prize, Allryder API Prize, Fab Lab Berlin Prize*.
Developed GREENtire, an iOS app which consolidates useful information from different sensors of the car and from partner APIs to evaluate the driving behavior.

Sept. 2013 - May 2014 **German Academic Exchange Service Scholarship (DAAD Jahresstipendium)**.
German government scholarship from the German Academic Exchange Service (Deutscher Akademischer Austausch Dienst, DAAD) to study at a North American university for one academic year, covering tuition and living expenses.

2010/2011 **informatiCup 2011**, *organized by the Gesellschaft für Informatik, Bonn, Germany*.
Participated in first round and in final round (6/38 teams invited). Wrote optimization algorithms for placing ATMs on a map, using Simulated Annealing, Tabu Search and greedy algorithms.

2007 - 2010 **German Federal Competition in Computer Science**.
Participated three years in a row. 30/around 1100 participants are invited to the final round.
- [2009/2010] 1st prize in first two rounds, invited to final round *(University of Freiburg)*
- [2008/2009] 2nd prize in first two rounds
- [2007/2008] 1st prize in first two rounds, invited to final round *(Max Planck Institute for CS)*

2008/2009 **German Federal Competition in Mathematics**, 3rd prize in first round.

Papers, evaluation and certificates: `http://m-sp.org/`

Skills

Programming: Android (A), C (C), C++ (B), C# .NET (A), Groovy (A), Haskell (A), Java EE (A), Java SE (C), LLVM (A), NumPy (A), Prolog (A), Python (B), Ruby (MRI, MagLev) (B), OCaml (A), Smalltalk (Amber, GemStone, Pharo, Seaside, Squeak) (C), SQL (B), Visual Basic (VB 6, VBA) (A).

Software Engineering: Design Patterns (B), Extreme Programming (A), BDD (A), Git (B), Jenkins (A), Scrum (A), Subversion (A), TDD (A), UML (B).

Server OS: Debian/Linux Server (A), Windows Server (A).

Web: CSS (A), Grails (B), HTML (A), JavaScript (A), jQuery (A), Ruby on Rails (A).

Certifications: Database Administration Fundamentals (MTA 98-364)
Windows Server Administration Fundamentals (MTA 98-365)
Windows Applications Development with Microsoft .NET Framework 4 (MCTS 72-511) .

A: level 1/basic, B: level 2/experienced, C: level 3/expert

Digital verification: `http://goo.gl/tUV71`, Transcript ID: `963416` and `963421`, Access Code: `62478569`

Hobbies and Interests

Memberships: ACM, Gesellschaft für Informatik e.V. (GI), Deutsche Physikalische Gesellschaft e.V. (DPG), and Bundeswettbewerb Informatik Alumni und Freunde e.V..

Music: Playing trumpet and flugelhorn.

Sports: Running, Speedminton, swimming.