

Paul Bittner, M.Sc.

paul.bittner@uni-ulm.de



Researcher on software engineering and programming languages; longtime professional and hobby programmer; can formalize and prove soundness properties of software; values and writes high-quality documentation; enjoys engineering expressive, easy-to-use but hard-to-misuse systems, as well as exploring problem specifications deeply and foundationally to profit from applying tools and methods across disciplines.



Research Assistant

2020/03–present

Ulm University (2020–24), Paderborn University (2024), TU Braunschweig (2025)

- 27 scientific publications (5 as first-author including 4 top-ranked conferences) in the fields of software engineering, programming languages, computer graphics
- developed several small to large-scale and peer-reviewed research prototypes
- team lead in several (international) research efforts
- supervised multiple bachelor's and master's theses within my research agenda
- teaching assistant for compiler construction, software product lines, software engineering projects, seminars

Student Research Assistant

2019/07–2020/01

Inst. of Software Engineering and Autom. Inf., TU Braunschweig

Designed, implemented, and published [6] a meta-algorithm for reducing a particular SMT problem to SAT in the context of configuring university courses.

Student Research Assistant

2016/11–2020/01

Computer Graphics Lab, TU Braunschweig

Responsible for maintaining and extending C++/OpenGL real-time rendering engines for research on virtual reality, panorama imagery, and animation. I presented the lab's research to pupils once a year.

Part-time Junior Software Developer

2014/06–2015/10

Richter Datensysteme GmbH

C# front-end development, software testing

Other Positions

2015/11–2017/02 *Tutor for Lectures on Algorithms and Data Structures*
Algorithms Department, TU Braunschweig

2014/05–2015/09 *Occasional Part-Time Jobs at Expos*
Event Consulting & Management GmbH

Awards

2024/10 [Distinguished Artifact](#) at OOPSLA'24 *as first author*

2024/09 [Best Research Paper](#) at SPLC'24 *as co-author*

2024/07 [Best Demonstrations Paper](#) at FSE'24 *as first author*

2022/09 [Best Demonstrations Paper](#) at SPLC'21 *as co-author*

2021/08 [Best Artifact](#) at ESEC/FSE'21 *as first author*

2016/07 Winner of the Software Engineering Student Competition at TU Braunschweig *As a team, we implemented a 3D game engine in Java including an editor and a small game. We presented our product next to all other teams at the uni's exhibition to a jury consisting of professors, company delegates, and student representatives.*

Education

PhD in Computer Science
2020–2025 (est.), Ulm Univ.

Analyzing Edits to Static Variability

Master in Computer Science

2017–2020, TU Braunschweig

*Semi-Automated Inference of Feature
Traceability During Software
Development*

Bachelor in Computer Science

2014–2017, TU Braunschweig

*Evaluation of Skinning Techniques for
Skeletal Animation in MonSteR*

Communication

- excellent scientific writing
- high-quality documentation
- experienced speaker
- experienced supervisor and teacher

Languages & Tools

Expert: Agda, Java, C/C++, Haskell, C#, Git, LaTeX

Experienced: Python, ELisp, Linux, real-time rendering, game engine development

Knowledgeable: Kotlin, JS, ANTLR, Nix/NixOS, ...

Math & Formal Methods

Expert: theorem proving, formal semantics, specify and implement PLs, DSLs, compilers, interpreters; software variability

Experienced: type theory, category theory, algebra, logic(s), constraint solving

Languages

German (native), English (fluent)

Portfolio

Vatras

Agda



12 ★

formal framework for modeling, studying, and comparing languages for static variability in terms of proven to be correct compilers

DiffDetective

Java



9 ★

variability-aware source code differencing and large scale empirical analyses of git repositories

Feature Trace Recording

Haskell



5 ★

concept implementation for recording code-to-feature traces from source code edits

Polypropylene

C++



19 ★

embedded domain-specific language and dynamic type-system for polymorphism-aware entity component systems

PaxEngine 3

C++



20 ★

plugin-based 2D/3D game engine based on Polypropylene, OpenGL, SDL, Box2D, and assimp, and including several demos

Centers of Rotation Skinning

C++/GLSL




59 ★

shaders and library to compute centers of rotation for a specific 3D skeletal animation method

A full list of my projects can be found on my website pmbittner.github.io/projects/.

Highlighted Publications

- [1] On the Expressive Power of Languages for Static Variability
P. M. Bittner, A. Schultheiß, B. Moosherr, J. M. Young, L. Teixeira, E. Walkingshaw, P. Ataei, and T. Thüm
PACMPL no. OOPSLA2, Oct. 2024, DOI: [10.1145/3689747](https://doi.org/10.1145/3689747), , **Distinguished Artifact**
- [2] Variability-Aware Differencing with DiffDetective
P. M. Bittner, A. Schultheiß, B. Moosherr, T. Kehrer, and T. Thüm
FSE Companion, Jul. 2024, DOI: [10.1145/3663529.3663813](https://doi.org/10.1145/3663529.3663813), , **Best Demonstrations Paper**
- [3] Views on Edits to Variational Software
P. M. Bittner, A. Schultheiß, S. Greiner, B. Moosherr, S. Krieter, C. Tinnes, T. Kehrer, and T. Thüm
SPLC, Aug. 2023, DOI: [10.1145/3579027.3608985](https://doi.org/10.1145/3579027.3608985), 
- [4] Classifying Edits to Variability in Source Code
P. M. Bittner, C. Tinnes, A. Schultheiß, S. Viegner, T. Kehrer, and T. Thüm
ESEC/FSE, Nov. 2022, DOI: [10.1145/3540250.3549108](https://doi.org/10.1145/3540250.3549108), 
- [5] Feature Trace Recording
P. M. Bittner, A. Schultheiß, T. Thüm, T. Kehrer, J. M. Young, and L. Linsbauer
ESEC/FSE, Aug. 2021, DOI: [10.1145/3468264.3468531](https://doi.org/10.1145/3468264.3468531), , **Best Artifact**
- [6] SAT Encodings of the At-Most-k Constraint – A Case Study on Configuring University Courses
P. M. Bittner, T. Thüm, and I. Schaefer
SEFM, Sep. 2019, DOI: [10.1007/978-3-030-30446-1_7](https://doi.org/10.1007/978-3-030-30446-1_7)

A full list of my publications can be found on my website pmbittner.github.io/publications/.