



# Carolin Brandt

PHD STUDENT IN SOFTWARE ENGINEERING

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## Education

### Postdoctoral Researcher

2024 - current

DELFT UNIVERSITY OF TECHNOLOGY, SOFTWARE ENGINEERING RESEARCH GROUP

- Empowering automatic generation tools to collaborate with software developers
- Strengthening my experience with a focus on co-supervising PhD Students and international / industry research collaborations
- Part of the [TestShift project](#), supervised by [Andy Zaidman](#)

### Visiting PhD Student

August - November 2023

HAMBURG UNIVERSITY, APPLIED SOFTWARE TECHNOLOGY GROUP

- Guest of Prof. Walid Maalej, one of the world's experts in requirements engineering
- Exploring connections between software testing and requirements engineering research

### PhD Student (Thesis submitted, Defence: 8th of July 2024)

2020 - 2024

DELFT UNIVERSITY OF TECHNOLOGY, SOFTWARE ENGINEERING RESEARCH GROUP

- Generating tests for and with developers using test amplification and visualization
- Investigating how automatic tools effectively collaborate with software developers to enrich their day-to-day development activities
- Part of the [TestShift project](#), supervised by [Andy Zaidman](#)

## MASTER

### How to Analyze Build Logs — A Comparative Study of Chunk Retrieval Techniques

2019

PAPER-BASED MASTER THESIS, GUEST AT THE SOFTWARE ENGINEERING RESEARCH GROUP, DELFT UNIVERSITY OF TECHNOLOGY

- Composing a dataset of build logs labeled with extractable substrings
- Comparing Programming by Example, classical information retrieval and keyword search

### Elite Graduate Program Software Engineering

2017 - 2019

UNIVERSITY OF AUGSBURG, TECHNICAL UNIVERSITY OF MUNICH, LUDWIGS-MAXIMILIANS-UNIVERSITY MUNICH

Avg. grade: 1.09, 'very good'

- Geared towards especially talented and motivated students in computer science
- Advanced education in software engineering, formal methods, database systems, distributed systems and human-computer interaction
- Highly selective admission: at most 20 students per year

## BACHELOR

### A Description Language for Structural Smells

2017

BACHELOR THESIS IN COMPUTER SCIENCE

- Developed a domain specific language to define automated analyses for structural smells within requirements artifacts
- Implemented automated analysis generation within the Qualicen Scout requirements analysis tool

### Scholarship "Deutschlandstipendium"

2016-2018

COMBINED PUBLIC AND INDUSTRIAL SCHOLARSHIP FOR EXCELLENT STUDENTS

### Admission to best.in.tum

2015

GROUP OF THE BEST 2% OF STUDENTS AT THE FACULTY OF COMPUTER SCIENCE

### Bachelor Computer Science: Games Engineering

2014 - 2017

TECHNICAL UNIVERSITY OF MUNICH

Avg. grade: 1.3, 'very good'

- Computer science with a practical focus in games
- Computer graphics, game physics, artificial intelligence, social games, human-computer interaction and usability

## Publications

### JOURNALS

#### Shaken, Not Stirred. How Developers Like Their Amplified Tests

2024

BRANDT, CAROLIN; KHATAMI, ALI; WESSEL, MAIRIELI; ZAIMAN, ANDY

- IEEE Transactions on Software Engineering
- <https://doi.ieeecomputersociety.org/10.1109/TSE.2024.3381015>, preprint: <https://carolin-brandt.de/publications/brandt-tse24.pdf>

## Developer-Centric Test Amplification: The Interplay Between Automatic Generation and Human Exploration

2022

BRANDT, CAROLIN; ZAIDMAN, ANDY

- Empirical Software Engineering 27.4 (2022): 1-35.
- <https://doi.org/10.1007/s10664-021-10094-2> (open access)

## CONFERENCES

### Mind the Gap: What Working With Developers on Fuzz Tests Taught Us About Coverage Gaps

2024

BRANDT, CAROLIN; CASTELLUCCIO, MARCO; HOLLER, CHRISTIAN; KRATZER, JASON; ZAIDMAN, ANDY; BACCHELLI, ALBERTO

- International Conference on Software Engineering: Software Engineering in Practice (ICSE-SEIP)
- Collaboration with Mozilla and the University of Zurich
- <https://doi.org/10.1145/3639477.3639721>, preprint: <https://carolin-brandt.de/publications/brandt-icseseip24.pdf>

### Using GitHub Copilot for Test Generation in Python: An Empirical Study

2024

EL HAJI, KHALID; BRANDT, CAROLIN; ZAIDMAN, ANDY

- ACM/IEEE International Conference on Automation of Software Test (AST'24)
- <https://doi.org/10.1145/3644032.3644443>, preprint: <https://carolin-brandt.de/publications/elhaji-ast24.pdf>

### When to Let the Developer Guide: Trade-offs Between Open and Guided Test Amplification

2023

BRANDT, CAROLIN; WANG, DANYAO; ZAIDMAN, ANDY

- IEEE International Working Conference on Source Code Analysis and Manipulation (SCAM'23)
- <https://doi.org/10.1109/SCAM59687.2023.00032>, preprint: [https://carolin-brandt.de/publications/guided\\_test\\_amplification\\_SCAM\\_2023.pdf](https://carolin-brandt.de/publications/guided_test_amplification_SCAM_2023.pdf)

### How Does This New Developer Test Fit In? A Visualization to Understand Amplified Test Cases

2022

BRANDT, CAROLIN; ZAIDMAN, ANDY

- IEEE Working Conference on Software Visualization (VISSOFT'22)
- <https://doi.org/10.1109/VISSOFT55257.2022.00011>, preprint: [https://carolin-brandt.de/publications/TIG\\_paper\\_VISSOFT\\_2022.pdf](https://carolin-brandt.de/publications/TIG_paper_VISSOFT_2022.pdf)

### Fixing Continuous Integration Tests From Within the IDE With Contextual Information

2022

BOONE, CASPER; BRANDT, CAROLIN; ZAIDMAN, ANDY

- IEEE/ACM International Conference on Program Comprehension (ICPC'22)
- <https://doi.org/10.1145/3524610.3527908>, preprint: [https://carolin-brandt.de/publications/TestAxis\\_icpc22.pdf](https://carolin-brandt.de/publications/TestAxis_icpc22.pdf)

### Naming Amplified Tests Based on Improved Coverage

2021

NIJKAMP, NIENKE; BRANDT, CAROLIN; ZAIDMAN, ANDY

- IEEE International Working Conference on Source Code Analysis and Manipulation (SCAM '21)
- <https://doi.org/10.1109/SCAM52516.2021.00036>, preprint: [https://carolin-brandt.de/publications/NATIC\\_paper.pdf](https://carolin-brandt.de/publications/NATIC_paper.pdf)

### Removing Redundant Statements in Amplified Test Cases

2021

OOSTERBROEK, WESSEL; BRANDT, CAROLIN; ZAIDMAN, ANDY

- IEEE International Working Conference on Source Code Analysis and Manipulation (SCAM '21)
- <https://doi.org/10.1109/SCAM52516.2021.00037>, preprint: [https://carolin-brandt.de/publications/RS\\_paper.pdf](https://carolin-brandt.de/publications/RS_paper.pdf)

### LogChunks: A Data Set for Build Log Analysis

2020

BRANDT, CAROLIN; PANICHELLA, ANNIBALE; ZAIDMAN, ANDY; BELLER, MORITZ

- International Conference on Mining Software Repositories (MSR '20).
- <https://doi.org/10.1145/3379597.3387485> (open access)

## WORKSHOPS

### Strategies and Challenges in Recruiting Interview Participants for a Qualitative Evaluation

2022

BRANDT, CAROLIN; ZAIDMAN, ANDY

- International Workshop on Recruiting Participants for Empirical Software Engineering (RoPES'22)
- preprint: [https://carolin-brandt.de/publications/ropes\\_2022.pdf](https://carolin-brandt.de/publications/ropes_2022.pdf)

### Incremental Just-In-Time Test Generation in Lock-Step with Code Development

2022

BRANDT, CAROLIN

- International Summer School on Search-and Machine Learning-based Software Engineering (SMILESENG)
- Received the Best "New Ideas and Work in Progress" Paper/Presentation Award
- preprint: [https://carolin-brandt.de/publications/smileseng\\_2022\\_abstract.pdf](https://carolin-brandt.de/publications/smileseng_2022_abstract.pdf)

### Pen-Pen: A Wellbeing Design to Help Commuters Rest and Relax

2018

PICHLMAIR, MONIKA; BRANDT, CAROLIN; HENRICH, MARCEL; BIEDERER, ALEXANDER; ASLAN, ILHAN; BITTNER, BJÖRN; ANDRÉ, ELISABETH

- Designed and evaluated a neck-cushion, mobile app and multi-modal feedback loop to increase commuters' wellbeing.
- ICMI Human-Habitat for Health Workshop, <https://doi.org/10.1145/3279963.3279966>

## Prizes

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- 2023 **Distinguished Reviewer Award**, International Conference on Mining Software Repositories
- 2022 **Best “New Ideas and Work in Progress” Paper / Presentation**, SMILESENG Summer School
- 2022 **Award for Best Artifact**, IEEE Working Conference on Software Visualization
- 2022 **Second Place Poster Competition**, Alice & Eve 2022
- 2021 **International Women in Technology Scholarship**, Personal Scholarship by Zonta
- 2017 **First Place at the HackaTUM Hackathon**, Category “Bike-Rental Systems Analysis”
- 2014 **Best Graduate in Chemistry**, German Chemical Society
- 2014 **Third Place at the Individual Competition of the “Day of Mathematics”**, University of Ulm

## Academic Service

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- 2024 **ASE**, Artifact Evaluation Committee
- 2023+24 **Mining Software Repositories**, Junior Program Committee (2023), Program Committee (2024)
- 2023+24 **Mining Software Repositories: Data and Tool Showcase**, Program Committee
- 2024 **VST**, Program Committee
- 2023 **ACM Transactions on Software Engineering and Methodology**, Journal Reviewer
- 2022 **FUZZING**, Artifact Evaluation Committee
- 2022+23 **IEEE Transactions on Software Engineering**, Journal Reviewer
- 2022 **Journal of Systems and Software**, Journal Reviewer
- 2022 **BENEVOL, TestVis**, Program Committee
- 2022 **ECOOP**, Publicity Chair
- 2022 **Alice & Eve**, Web Chair
- 2021 **Journal of Software: Evolution and Process**, Journal Reviewer
- 2021 **VISOFT**, Program Committee, Publicity Chair
- 2021 **ISSTA**, Artifact Evaluation Committee
- 2021 **ICSE**, Organization Committee, Watch Parties and Gather.Town
- 2020 **ICSE**, Student Volunteer, Streaming in the Europe Timeband
- 2020 **ESEC/FSE, ASE**, Student Volunteer

## Practical Experiences

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### Research Industry Internship at Oracle Labs

TWO MONTHS WITH THE MULTILINGUAL ENGINE TEAM AT ORACLE LABS ZURICH, SWITZERLAND

- Transformed pandas data analysis operations to SQL
- Benchmarked against python running within the database process using GraalVM

2018

*Python, pandas and SQL*

### Software Engineer at Qualicen GmbH

QUALITY ANALYSES OF NATURAL LANGUAGE REQUIREMENTS AND TESTS ARTIFACTS

- Extended ConQAT based analyses of requirements documents
- Halved the code size by safely deleting no longer used research components
- Developed automated UI test using Ranorex
- Managed GitLab and development workflow

2017-2018

*Java, ConQAT and Ranorex*

### Teaching Assistant

Introduction to Software Engineering  
Operating Systems and Embedded Programming

2016

### Ferienakademie Technical University of Munich

2017: Creating Animations by Machine Learning and Simulation  
2016: Cyber Physical Systems  
2015: Let's Play – Simulated Physics for Interactive Games

2015, 2016, 2017

*Neural Networks with Tensorflow  
iOS Programming  
Project Manager*

## Additional Activities

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### DiversAbility: TU Delft Resource Group for Neurodivergence, Hidden and Chronic Vulnerabilities

Board Member

2016-2018

## Honorary supervisor at the “Kibelino” summer camp for children from 7 to 15

2016-2018

Program Manager

## Private tutor

2013 - 2017

Maths, Physics and Chemistry

## Hobbies

Archery, Organizing, Hiking, Gardening

# Qualifications

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## LANGUAGES

<b>native speaker</b>	German
<b>fluent</b>	English, Dutch
<b>elementary</b>	French, Japanese

## SOFTWARE DEVELOPMENT

<b>Main Languages</b>	Java, Python
<b>Advanced experience</b>	LaTeX, C#
<b>Basic experience</b>	Ruby, R, Ranorex, C, C++, XText, Xamarin, ConQAT