# Dr. Norman Peitek

*Postdoctoral Researcher*

## Education

2016–2022 **Dr. rer. nat.**, *University of Technology Chemnitz*, Germany, *Summa cum laude*
**Dissertation Award of the University**
Thesis: A Neuro-Cognitive Perspective of Program Comprehension

2012–2014 **Master of Science**, *Otto von Guericke University Magdeburg*, Germany, *1.5 (Very Good)*
Major: Business Information Systems
Thesis: Exploration of Competitive Market Behavior Using Near-Real-Time Sentiment Analysis (1.1, Very Good)

2011 **Exchange Semester**, *University of Wisconsin—Stevens Point*, USA

2009–2012 **Bachelor of Science**, *Otto von Guericke University Magdeburg*, Germany, *1.7 (Good)*
Major: Business Information Systems
Thesis: Using the Orientation Sensor for GeoPointing on Indoor Maps (1.0, Very Good)

2009 **Exchange Student**, *Thompson Rivers University*, Canada

## Experience

### Vocational

Since 2022 **Postdoctoral Researcher**, *Saarland University, Saarland Informatics Campus*, Saarbrücken, Germany
Continuing and broadening our research on program comprehension with neuro- and physio-psychological methods.

2016–2021 **Doctoral Researcher**, *Leibniz Institute for Neurobiology*, Magdeburg, Germany
Researching program comprehension and programmer expertise with a novel perspective of fMRI and eye tracking.

Since 2014 **Co-Founder**, *futurestud.io*
Teaching developers technical skills on Android and web development.

2014–2016 **Software Consultant**, *Ultra Tendency*, Magdeburg, Germany
I worked as an IT Consultant on projects for medium to large businesses. My focus areas were mobile apps, especially Android, node.js and large business applications with C# .NET.

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### Student Assistance

2013–2014 **Student Intern**, *University of Wisconsin—Stevens Point*, USA
Year-long internship at the department of Web and Media Services. I was responsible of transferring old legacy software systems to new standard software in an advisory and technical role. The majority was re-implemented on SharePoint 2010.

2011, 2013 **Research Assistant**, *Otto von Guericke University Magdeburg*, Germany

2012 **Research Assistant**, *Berlin School of Economics and Law*, Germany

### Other

2009 **Alternative Civilian Service**, *University Clinic Magdeburg*, Germany

## Teaching

### Lecturer

2023, 2024, 2025 **Software Engineering Lab**, *Saarland University*, Germany

2022, 2025 **Empirical Software Engineering Research**, *Saarland University*, Germany

2024 **The Eye of the Beholder: What Can Eye-Tracking Data Reveal about Code? (Seminar)**, *Saarland University*, Germany

2022, 2023 **Software Engineering Research in the Neuroage (Seminar)**, *Saarland University*, Germany

2015, 2016 **Mobile and Distributed Systems**, *Bingen University of Applied Sciences*, Germany

### Guest Lecture/Invited Talks

2023 **Neuroscience & Software Engineering: A New Wave of Research on Programmers**, *Humboldt-Universität zu Berlin*, Germany

2019, 2021 **Your Brain on Code**, *Magdeburger Developer Days*, Germany

2019, 2020 **Program Comprehension Research with Neuroscience Methods**, *University of Technology Chemnitz*, Germany

2019 **Program Comprehension Research with Neuroscience Methods**, *Saarland University*, Germany

## Professional Service

Since 2022 Steering Committee: International Workshop on Eye Movements in Programming (EMIP)

2019, 2021, 2023, 2024, 2025 Organizer: International Workshop on Eye Movements in Programming (EMIP)

2023 Proceedings Co-Chair: International Conference on Program Comprehension (ICPC)

### Program Committees

since 2024 International Conference on Software Engineering - New Ideas and Emerging Results (ICSE-NIER)

since 2024 International Conference on Mining Software Repositories - Registered Reports (MSR-RR)
2024 International Computing Education Research (ICER)
2024 Human Factors for Software Dependability (HFSD)
2023, 2024 Workshop on Advances in Human-Centric Experiments in Software Engineering (HUMAN)
2023 International Symposium on Empirical Software Engineering and Measurement (ESEM)
2019, 2022 International Workshop on Eye Movements in Programming (EMIP)
2019 ACM Symposium on Eye Tracking Research & Applications (ETRA-ET4S)
2018 IEEE/ACM International Conference on Program Comprehension (ICPC)

### Reviewer

Since 2018 Empirical Software Engineering (EMSE), Springer
Since 2019 Transactions on Software Engineering (TSE), IEEE
Since 2020 Transactions on Software Engineering and Methodology (TOSEM), ACM
2023 Journal of Systems & Software, Elsevier
2023 PeerJ, O'Reilly & SAGE
2022 Automated Software Engineering, Springer
2021 APSIPA Transactions on Signal and Information Processing
2020 eNeuro, Society for Neuroscience
2020 Computer Science Education, Taylor & Francis
2020 Cognitive Science, Wiley
2019 Human Brain Mapping, Wiley
2019 PLOS ONE, Public Library of Science

## Awards

2022 **University Award for Dissertation**, *Chemnitz University of Technology*
2021 **ACM SIGSOFT Distinguished Paper Award**, *International Conference on Software Engineering (ICSE)*
2019 **Best Tool Demo Award**, *International Conference on Program Comprehension (ICPC)*
2011–2014 **Full Study Scholarship**, *Friedrich Naumann Foundation for Freedom*

## Languages

German Native proficiency
English Full professional proficiency
French Elementary proficiency

## Publications

Total: 31, citations: 646, h-index: 11 (based on Google Scholar)

### Dissertation

Norman Peitek. *A Neuro-Cognitive Perspective of Program Comprehension*. PhD thesis, University of Technology Chemnitz, 2022. University Award.

### Book Chapters

Michael Hanke, Sebastiaan Mathôt, Eduard Ort, Norman Peitek, Jörg Stadler, and Adina Wagner. A Practical Guide to Functional Magnetic Resonance Imaging with Simultaneous Eye Tracking for Cognitive Neuroimaging Research. In *Spatial Learning and Attention Guidance*, pages 291–305. Springer US, 2020.

### Refereed Journal Articles

Janet Siegmund, Norman Peitek, Sven Apel, and Norbert Siegmund. Mastering Variation in Human Studies: The Role of Aggregation. *Trans. Softw. Eng. Methodol.*, 30(1), December 2021.

Janet Siegmund, Norman Peitek, André Brechmann, Chris Parnin, and Sven Apel. Studying Programming in the Neuroage: Just a Crazy Idea? *Communications of the ACM*, 63(6):30–34, 2020.

Norman Peitek, Janet Siegmund, Sven Apel, Christian Kästner, Chris Parnin, Anja Bethmann, Thomas Leich, Gunter Saake, and André Brechmann. A Look into Programmers' Heads. *IEEE Transactions on Software Engineering (TSE)*, 46(4):442–462, 2020.

### Refereed Conference Papers

Timon Dörzapf, Norman Peitek, Marvin Wyrich, and Sven Apel. Data Analysis Tools Affect Outcomes of Eye-Tracking Studies. In *Proc. Int'l Symposium Empirical Software Engineering and Measurement (ESEM)*, pages 96–106. ACM, 2024.

Norman Peitek, Annabelle Bergum, Maurice Rekrut, Jonas Mucke, Matthias Nadig, Chris Parnin, Janet Siegmund, and Sven Apel. Correlates of Programmer Efficacy and their Link to Experience: A Combined EEG and Eye-Tracking Study. In *Proc. Joint Meeting on Foundations of Software Engineering*, ESEC/FSE, pages 120–131. ACM, 2022.

Norman Peitek, Sven Apel, Chris Parnin, André Brechmann, and Janet Siegmund. Program Comprehension and Code Complexity Metrics: An fMRI Study. **ACM SIGSOFT Distinguished Paper Award**. In *Proc. Int'l Conf. Software Engineering (ICSE)*, pages 524–536. ACM, 2021.

Norman Peitek, Janet Siegmund, and Sven Apel. What Drives the Reading Order of Programmers? An Eye Tracking Study. In *Proc. Int'l Conference Program Comprehension (ICPC)*, pages 342—353. IEEE, 2020.

Norman Peitek, Sven Apel, André Brechmann, Chris Parnin, and Janet Siegmund. CodersMUSE: Multi-Modal Data Exploration of Program-Comprehension Experiments. **Best Tool Demo Award**. In *Proc. Int'l Conference Program Comprehension (ICPC)*, pages 126–129. IEEE, 2019.

Jennifer Bauer, Janet Siegmund, Norman Peitek, Johannes Hofmeister, and Sven Apel. Indentation: Simply a Matter of Style or Support for Program Comprehension? In *Proc. Int'l Conference Program Comprehension (ICPC)*, pages 154–164. IEEE, 2019.

Norman Peitek, Janet Siegmund, Chris Parnin, Sven Apel, Johannes Hofmeister, and André Brechmann. Simultaneous Measurement of Program Comprehension with fMRI and Eye Tracking: A Case Study. In *Proc. Int'l Symposium Empirical Software Engineering and Measurement (ESEM)*, pages 24:1–24:10. ACM, 2018.

Norman Peitek, Janet Siegmund, Chris Parnin, Sven Apel, and André Brechmann. Toward Conjoint Analysis of Simultaneous Eye-Tracking and fMRI Data for Program-Comprehension Studies. In *Proc. Int'l Workshop on Eye Movements in Programming*, pages 1:1–1:5. ACM, 2018.

Norman Peitek, Janet Siegmund, Chris Parnin, Sven Apel, and André Brechmann. Beyond Gaze: Preliminary Analysis of Pupil Dilation and Blink Rates in an fMRI Study of Program Comprehension. In *Proc. Int'l Workshop on Eye Movements in Programming*, pages 4:1–4:5. ACM, 2018.

Norman Peitek. A Neuro-Cognitive Perspective of Program Comprehension. In *Companion Proc. of Int'l Conf. on Software Engineering*, ICSE 2018, pages 496–499. IEEE, 2018.

Janet Siegmund, Norman Peitek, Chris Parnin, Sven Apel, Johannes Hofmeister, Christian Kästner, Andrew Begel, Anja Bethmann, and André Brechmann. Measuring Neural Efficiency of Program Comprehension. In *Proc. Joint Meeting on Foundations of Software Engineering*, ESEC/FSE, pages 140–150. ACM, 2017.

### Others

Elisa Madeleine Hartmann, Annabelle Bergum, Dominik Gorgosch, Norman Peitek, Sven Apel, and Janet Siegmund. Tapping into the Natural Language System with Artificial Languages when Learning Programming, 2024.

Annabelle Bergum, Anna-Maria Maurer, Norman Peitek, Regine Bader, Axel Mecklinger, Vera Demberg, Janet Siegmund, and Sven Apel. Unexpected but Informative: What Fixation-Related Potentials Tell Us about the Processing of Ambiguous Program Code, 2024.

Norman Peitek. Eine neurokognitive Perspektive auf Programmverständnis. In *Ausgezeichnete Informatikdissertationen 2022 (Band D23)*, pages 211–220. Gesellschaft für Informatik e.V., Bonn, 2023.

Norman Peitek, Sven Apel, Chris Parnin, André Brechmann, and Janet Siegmund. Program Comprehension and Code Complexity Metrics: A Replication Package of an fMRI Study. In *2021 IEEE/ACM 43rd International Conference on Software Engineering: Companion Proceedings (ICSE-Companion)*, pages 168–169, 2021.

André Neumann, Norman Peitek, André Brechmann, Karsten Tabelow, and Thorsten Dickhaus. Utilizing Anatomical Information for Signal Detection in Functional Magnetic Resonance Imaging. *WIAS Preprints*, pages 1–15, 2021.

Arooba Aqeel, Norman Peitek, Sven Apel, Jonas Muche, and Janet Siegmund. Understanding Comprehension of Iterative and Recursive Programs with Remote Eye Tracking. In *Proc. Annual Conf. Psychology of Programming Interest Group (PPIG)*, page 17, 2021.

Norman Peitek, Janet Siegmund, Chris Parnin, Sven Apel, Johannes Hofmeister, Christian Kästner, Andrew Begel, Anja Bethmann, and André Brechmann. Neural Efficiency of Top-Down Program Comprehension. In *Proc. of Software Engineering (SE)*, pages 151–152. GI, 2018.

Norman Peitek, Janet Siegmund, and André Brechmann. Enhancing fMRI Studies of Program Comprehension with Eye-Tracking. In *Proc. Int'l Workshop on Eye Movements in Programming*, pages 22–23. Freie Universität Berlin, 2017.

Chris Parnin, Janet Siegmund, and Norman Peitek. On the Nature of Programmer Expertise. In *Proc. Annual Conf. Psychology of Programming Interest Group (PPIG)*, pages 109–118, 2017.

Johannes Hofmeister, Jennifer Bauer, Janet Siegmund, Sven Apel, and Norman Peitek. Comparing Novice and Expert Eye Movements during Program Comprehension. In *Proc. Int'l Workshop on Eye Movements in Programming*, pages 17–18. Freie Universität Berlin, 2017.

Robert Neumann, Norman Peitek, and Juan José Cuadrado-Gallego. Geopointing on Indoor Maps: Enhancing Compass Sensor Accuracy to Enable Interactive Digital Object Selection in Smartphone-Based Map Applications. In *Proc. Int'l symposium on Mobility Management and Wireless Access*, pages 63–70. ACM, 2012.