

# Jonas Posner

POSTDOCTORAL RESEARCHER · HABILITATION CANDIDATE · LECTURER

University of Kassel, Germany

Research Group Programming Languages / Methodologies (PLM)

✉ jonas.posner@uni-kassel.de | 🏠 uni-kassel.de/go/posner | 🏠 jonasposner.com | 🔗 LinkedIn | 🎓 Google Scholar

## Position

### Postdoctoral Researcher & Habilitation Candidate & Lecturer

Apr. 25–PRESENT

UNIVERSITY OF KASSEL, GERMANY

Research Group Programming Languages/Methodologies (PLM)

### Chair Substitute

Oct. 24–Mar. 25

UNIVERSITY OF KASSEL, GERMANY

Research Group Software Engineering (SE)

### Postdoctoral Researcher & Lecturer

Aug. 22–Sept. 24

UNIVERSITY OF KASSEL, GERMANY

Research Group Programming Languages/Methodologies (PLM)

## Education

### Ph.D. Computer Science

2016–2022

UNIVERSITY OF KASSEL, GERMANY

magna cum laude

*Thesis:* Load Balancing, Fault Tolerance, and Resource Elasticity for Asynchronous Many-Task Systems

*Advisor:* Prof. Dr. Claudia Fohry (University of Kassel)

*Second Reviewer:* Prof. Dr. Martin Schulz (Technical University of Munich—TUM)

### M.Sc. Computer Science

2014–2016

UNIVERSITY OF KASSEL, GERMANY, 1.5 years program, 90 ECTS

90%

*Thesis:* Global Load Balancing and Intra-Node Synchronization with the Java Framework APGAS

### B.Sc. Computer Science, ranked top 2%

2010–2014

UNIVERSITY OF KASSEL, GERMANY, 3.5 years program, 210 ECTS

90%

*Thesis:* Fault-Tolerant Task Pools in the Parallel Programming Language X10

### Certificate of Chamber of Industry and Commerce: Computer Science Expert

2007–2010

BDO INTERNATIONAL, KASSEL, GERMANY, 3 years program

83%

*Thesis:* Installation and Configuration of Citrix Servers

## Research Interests

- High Performance Computing,
- Parallel Programming Models,
- Asynchronous Many-Task Systems (AMT),
- Load Balancing,
- Fault Tolerance, and
- Resource Elasticity.

## Publications

### JOURNALS

- [P1] Patrick Finnerty, **Jonas Posner**, Janek Bürger, Leo Takaoka, and Takuma Kanzaki. “On the Performance of Malleable APGAS Programs and Batch Job Schedulers”. In: *Springer Nature Computer Science* (2024). DOI: 10.1007/s42979-024-02641-7.

- [P2] **Jonas Posner**, Lukas Reitz, and Claudia Fohry. “Task-Level Resilience: Checkpointing vs. Supervision”. In: *Special Issue International Journal of Networking and Computing (IJNC)* 12.1 (2022), pp. 47–72. doi: 10.15803/ijnc.12.1\_47.
- [P3] **Jonas Posner**, Lukas Reitz, and Claudia Fohry. “A Comparison of Application-Level Fault Tolerance Schemes for Task Pools”. In: *Future Generation Computer Systems (FGCS)* 105 (2019), pp. 119–134. doi: 10.1016/j.future.2019.11.031.
- [P4] **Jonas Posner** and Claudia Fohry. “Hybrid Work Stealing of Locality-Flexible and Cancelable Tasks for the APGAS Library”. In: *The Journal of Supercomputing* (2018), pp. 1435–1448. doi: 10.1007/s11227-018-2234-8.
- [P5] **Jonas Posner** and Claudia Fohry. “A Java Task Pool Framework providing Fault-Tolerant Global Load Balancing”. In: *Special Issue on the International Journal of Networking and Computing (IJNC)* 8.1 (2018), pp. 2–31. doi: 10.15803/ijnc.8.1\_2.
- [P6] Claudia Fohry, Marco Bungart, and **Jonas Posner**. “Fault Tolerance Schemes for Global Load Balancing in X10”. In: *Scalable Computing: Practice and Experience (SCPE)* 16.2 (2015), pp. 169–186. doi: 10.12694/scpe.v16i2.1088.

## DISSERTATION

- [P7] **Jonas Posner**. “Load Balancing, Fault Tolerance, and Resource Elasticity for Asynchronous Many-Task Systems”. PhD thesis. University of Kassel, Germany, 2021. doi: 10.17170/kobra-202207286542.

## CONFERENCES & WORKSHOPS

- [P8] Patrick Zojer, **Jonas Posner**, and Taylan Özden. “Evaluating Malleable Job Scheduling in HPC Clusters using Real-World Workloads”. In: *Proceedings Latin American High Performance Computing Conference (CARLA)*. 2025. To appear.
- [P9] **Jonas Posner**, Nick Bietendorf, Dominik Huber, Martin Schreiber, and Martin Schulz. “Dynamic Resource Management: Comparison of Asynchronous Many-Task (AMT) and Dynamic Processes with PSets (DPP)”. In: *Workshop on Asynchronous Many-Task Systems and Applications (WAMTA)*. 2025. To appear. *Slides*.
- [P10] **Jonas Posner**. “The Impact of Evolving APGAS Programs on HPC Clusters”. In: *Proceedings Euro-Par Parallel Processing Workshops (DynResHPC)*. 2024. doi: 10.1007/978-3-031-90200-0\_25. *Slides*.
- [P11] **Jonas Posner**, Raoul Goebel, and Patrick Finnerty. “Evolving APGAS Programs: Automatic and Transparent Resource Adjustments at Runtime”. In: *Proceedings Workshop on Asynchronous Many-Task Systems and Applications (WAMTA)*. 2024. doi: 10.1007/978-3-031-61763-8\_15. *Slides*.
- [P12] **Jonas Posner**, Fabian Hupfeld, and Patrick Finnerty. “Enhancing Supercomputer Performance with Malleable Job Scheduling Strategies”. In: *Proceedings Euro-Par Parallel Processing Workshops (PECS)*. Springer, 2023. doi: 10.1007/978-3-031-48803-0\_14. *Slides*.
- [P13] Patrick Finnerty, Reo Takaoka, Takuma Kanzaki, and **Jonas Posner**. “Malleable APGAS Programs and their Support in Batch Job Schedulers”. In: *Proceedings Euro-Par Parallel Processing Workshops (AMTE)*. Springer, 2023. doi: 10.1007/978-3-031-48803-0\_8. *Slides*.
- [P14] **Jonas Posner** and Claudia Fohry. “Transparent Resource Elasticity for Task-Based Cluster Environments with Work Stealing”. In: *Proceedings International Conference on Parallel Processing (ICPP) Workshops (P2S2)*. ACM, 2021, pp. 1–10. doi: 10.1145/3458744.3473361.
- [P15] **Jonas Posner**, Lukas Reitz, and Claudia Fohry. “Checkpointing vs. Supervision Resilience Approaches for Dynamic Independent Tasks”. In: *Proceeding International Parallel and Distributed Processing Symposium (IPDPS) Workshops (APDCM)*. IEEE, 2021. doi: 10.1109/IPDPSW52791.2021.00089.
- [P16] **Jonas Posner**. “System-Level vs. Application-Level Checkpointing”. In: *International Conference on Cluster Computing (CLUSTER)*. IEEE, 2020, pp. 404–405. doi: 10.1109/CLUSTER49012.2020.00051.
- [P17] **Jonas Posner**, Lukas Reitz, and Claudia Fohry. “Comparison of the HPC and Big Data Java Libraries Spark, PCJ and APGAS”. In: *Proceedings International Conference on High Performance Computing, Networking, Storage and Analysis (SC) Workshops (PAW-ATM)*. ACM, 2018, pp. 11–22. doi: 10.1109/PAW-ATM.2018.00007.
- [P18] Claudia Fohry, **Jonas Posner**, and Lukas Reitz. “A Selective and Incremental Backup Scheme for Task Pools”. In: *Proceedings International Conference on High Performance Computing & Simulation (HPCS)*. 2018, pp. 621–628. doi: 10.1109/HPCS.2018.00103.
- [P19] **Jonas Posner** and Claudia Fohry. “A Combination of Intra- and Inter-place Work Stealing for the APGAS Library”. In: *Proceedings Parallel Processing and Applied Mathematics (PPAM) Workshops (WLPP)*. Springer, 2018, pp. 234–243. doi: 10.1007/978-3-319-78054-2\_22.
- [P20] **Jonas Posner** and Claudia Fohry. “Fault Tolerance for Cooperative Lifeline-Based Global Load Balancing in Java with APGAS and Hazelcast”. In: *International Parallel and Distributed Processing Symposium (IPDPS) Workshops (APDCM)*. IEEE, 2017, pp. 854–863. doi: 10.1109/ipdpsw.2017.31.
- [P21] **Jonas Posner** and Claudia Fohry. “Cooperation vs. Coordination for Lifeline-Based Global Load Balancing in APGAS”. In: *Proceedings of the 6th ACM SIGPLAN Workshop on X10*. ACM, 2016, pp. 13–17. doi: 10.1145/2931028.2931029.

- [P22] Claudia Fohry, Marco Bungart, and **Jonas Posner**. “Towards an Efficient Fault-Tolerance Scheme for GLB”. In: *Proceedings of the ACM SIGPLAN Workshop on X10*. ACM, 2015, pp. 27–32. doi: 10.1145/2771774.2771779.
- [P23] Marco Bungart, Claudia Fohry, and **Jonas Posner**. “Fault-Tolerant Global Load Balancing in X10”. In: *Proceedings International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC)*. IEEE, 2014, pp. 471–478. doi: 10.1109/synasc.2014.69.

## POSTERS & EXTENDED ABSTRACTS

- [P24] Patrick Finnerty, **Jonas Posner**, Tomio Kamada, Zhiyi Zhu, and Chikara Ohta. “Parallel Program Performance Prediction based on Hardware Specification”. In: *Sensor Network and Mobile Intelligence (SeMI) Forum, Tokyo*. 2025. Presentation.
- [P25] **Jonas Posner**. “Resource Adaptivity at Task-Level”. In: *Parallel Applications Workshop, Alternatives To MPI+X (PAW-ATM)*. 2024. doi: 10.5281/zenodo.14211666. Extended Abstract. *Slides*.
- [P26] **Jonas Posner** and Patrick Finnerty. “Project Wagomu: Elastic HPC Resource Management”. In: *ISC High Performance Conference*. 2024. *Poster*.
- [P27] **Jonas Posner**. “Load Balancing, Fault Tolerance, and Resource Elasticity for Asynchronous Many-Task Systems”. In: *International Conference on High Performance Computing, Networking, Storage and Analysis (SC)*. 2022. *Poster*.
- [P28] **Jonas Posner**. “Asynchronous Many-Tasking (AMT): Load Balancing, Fault Tolerance, Resource Elasticity”. In: *ISC High Performance Conference*. 2022. *Poster*.
- [P29] **Jonas Posner**. “Resource Elasticity at Task-Level”. In: *Proceedings International Parallel and Distributed Processing Symposium (IPDPS), Ph.D. Forum*. IEEE, 2021. doi: 10.1109/IPDPSW52791.2021.00160. Extended Abstract.
- [P30] **Jonas Posner**. “Locality-Flexible and Cancelable Tasks for the APGAS Library”. In: *EuroHPC Summit Week, PRACEdays*. 2021. *Poster*.
- [P31] **Jonas Posner**. “A Generic Reusable Java Framework for Fault-Tolerant Parallelization with the Task Pool Pattern”. In: *International Parallel and Distributed Processing Symposium (IPDPS), Ph.D. Forum*. 2017. *Poster*.

## SOURCE CODE & ARTEFACTS

- [P32] **Jonas Posner** and Patrick Finnerty. *Project Wagomu: GitHub—Code Repositories*. URL: <https://github.com/ProjectWagomu>.
- [P33] **Jonas Posner** and Patrick Finnerty. *Project Wagomu: Zenodo—Artefacts and Slides*. URL: <https://zenodo.org/communities/ProjectWagomu>.

## Invited Talks

### Advances in Applied Computer Science Invited Speaker Series

02/2025

INVITED TALK, LOS ALAMOS NATIONAL LAB (U.S.)

- Title: Transparent Resource Adaptivity for Task-Based Applications on Supercomputers. *Slides*.

### Workshop on Effective Use of Resources on the Computing Continuum

04/2024

INVITED TALK, KOBE (JAPAN)

- Title: Elastic Runtimes and Applications for HPC Systems

## Peer-Reviewed Presentations

### Workshop on Asynchronous Many-Task Systems and Applications (WAMTA)

02/2025

PAPER PRESENTATION, PEER-REVIEWED, ST. LOUIS (U.S.)

- Title: Dynamic Resource Management: Comparison of Asynchronous Many-Task (AMT) and Dynamic Processes with PSets (DPP)

### Supercomputing (SC) Workshops (PAW-ATM)

11/2024

PRESENTATION, PEER-REVIEWED, ATLANTA (U.S.)

- Title: Resource Adaptivity at Task-Level

### Euro-Par Workshops (DynResHPC)

08/2024

PAPER PRESENTATION, PEER-REVIEWED, MADRID (SPAIN)

- Title: The Impact of Evolving APGAS Programs on HPC Clusters

<b>ISC High Performance Conference</b> POSTER PRESENTATION, PEER-REVIEWED, HAMBURG (GERMANY) • Title: Project Wagomu: Elastic HPC Resource Management	05/2024
<b>Workshop on Effective Use of Resources on the Computing Continuum</b> INVITED TALK, KOBE (JAPAN) • Title: Elastic Runtimes and Applications for HPC Systems	04/2024
<b>Workshop on Asynchronous Many-Task Systems and Applications (WAMTA)</b> PAPER PRESENTATION, PEER-REVIEWED, KNOXVILLE (U.S.) • Title: Evolving APGAS Programs: Automatic and Transparent Resources Adjustments at Runtime	02/2024
<b>Euro-Par Workshops (PECS)</b> PAPER PRESENTATION, PEER-REVIEWED, LIMASSOL (CYPRUS) • Title: Enhancing Supercomputer Performance with Malleable Job Scheduling Strategies	08/2023
<b>Supercomputing (SC), Doctoral Showcases</b> DISSERTATION PRESENTATION, PEER-REVIEWED, DALLAS (U.S.) • Title: Load Balancing, Fault Tolerance, and Resource Elasticity for Asynchronous Many-Task Systems	11/2022
<b>Ph.D. Disputation</b> PRESENTATION AND DEFENSE, UNIVERSITY OF KASSEL (GERMANY) • Title: Load Balancing, Fault Tolerance, and Resource Elasticity for Asynchronous Many-Task Systems	07/2022
<b>ISC High Performance Conference</b> POSTER PRESENTATION, PEER-REVIEWED, HAMBURG (GERMANY) • Title: Asynchronous Many-Tasking (AMT): Load Balancing, Fault Tolerance, Resource Elasticity	05/2022
<b>International Conference on Parallel Processing (ICPP) Workshops (P2S2)</b> PAPER PRESENTATION, PEER-REVIEWED, ONLINE • Title: Transparent Resource Elasticity for Task-Based Cluster Environments with Work Stealing	09/2021
<b>International Parallel and Distributed Processing (IPDPS) Workshops (APDCM)</b> PAPER PRESENTATION, PEER-REVIEWED, ONLINE • Title: Checkpointing vs. Supervision Resilience Approaches for Dynamic Independent Tasks	06/2021
<b>Ph.D. Forum International Parallel and Distributed Processing (IPDPS)</b> POSTER PRESENTATION, PEER-REVIEWED, ONLINE • Title: Resource Elasticity at Task-Level	06/2021
<b>IEEE Cluster</b> POSTER PRESENTATION, PEER-REVIEWED, ONLINE • Title: System-Level vs. Application-Level Checkpointing	09/2020
<b>EuroHPC Summit Week, PRACEdays</b> POSTER PRESENTATION, PEER-REVIEWED, ONLINE • Title: Locality-Flexible and Cancelable Tasks for the APGAS Library	03/2020
<b>Supercomputing (SC) Workshops (PAW-ATM)</b> PAPER PRESENTATION, PEER-REVIEWED, DENVER (U.S.) • Title: Comparison of the HPC and Big Data Java Libraries Spark, PCJ and APGAS	11/2019
<b>International Conference on High Performance Computing &amp; Simulation (HPCS)</b> PAPER PRESENTATION, PEER-REVIEWED, ORLÉANS (FRANCE) • Title: A Selective and Incremental Backup Scheme for Task Pools	07/2018

## Parallel Processing and Applied Mathematics (PPAM)

09/2017

PAPER PRESENTATION, PEER-REVIEWED, LUBLIN (POLAND)

- Title: A Combination of Intra- and Inter-place Work Stealing for the APGAS Library

## Ph.D. Forum International Parallel and Distributed Processing (IPDPS)

06/2017

POSTER PRESENTATION, PEER-REVIEWED, LAKE BUENA VISTA (U.S.)

- Title: A Generic Reusable Java Framework for Fault-Tolerant Parallelization with the Task Pool Pattern

## International Parallel and Distributed Processing (IPDPS) Workshops (APDCM)

06/2017

PAPER PRESENTATION, PEER-REVIEWED, LAKE BUENA VISTA (U.S.)

- Title: Fault Tolerance for Cooperative Lifeline-Based Global Load Balancing in Java with APGAS and Hazelcast

## Grant Proposals

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### The Central Research Fund (ZFF) of the University of Kassel

2022

PROJECT FOR PREPARING AN INDIVIDUAL POSTDOC GRANT PROPOSAL

- Funding: €10,000
- Role: Official applicant
- Status: *accepted*, run from 09/2022 to 09/2023

### The HPC-Europa3 program

2020

8-WEEK INTERNSHIP AT THE BARCELONA SUPERCOMPUTING CENTER (BSC)

- Funding: €3,200
- Role: Official applicant
- Status: *accepted*, but cancelled due to COVID-19

### Supercomputing Conference

2018 and 2021

TRAVEL GRANT

- Funding: €1,000 per year
- Role: Official applicant
- Status: *accepted*

### The Gauss Centre for Supercomputing (GCS), Germany

2024–2025

ACCESS TO THE SUPERMUC-NG HPC CLUSTER AT THE GAUSS CENTRE FOR SUPERCOMPUTING (GCS), GERMANY

- Funding: 100,000 CPU hours per year
- Role: Co-writer of the proposal
- Status: *accepted*

### The Center for Scientific Computing (CSC) of the Goethe University Frankfurt

2019–PRESENT

ACCESS TO THE GOETHE-HLR HPC CLUSTER AT THE UNIVERSITY OF FRANKFURT, GERMANY

- Funding: 300,000 CPU hours per year
- Role: Co-writer of the proposals
- Status: *accepted annually*

### The University Computer Centre (HRZ) of the Technical University Darmstadt

2023–PRESENT

ACCESS TO THE LICHTENBERG II HPC CLUSTER AT THE TECHNICAL UNIVERSITY DARMSTADT, GERMANY

- Funding: 300,000 CPU hours per year
- Role: Co-writer of the proposals
- Status: *accepted annually*

# Teaching and Supervising

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## **B.Sc. Lecture: Introduction to Parallel Processing**

Summer Semester 2025

- *Principal investigator.* Topics include shared memory, distributed memory, and GPUs. Duties include giving lectures, designing exercises, and taking oral exams.

6 ECTS

## **M.Sc. Thesis: Evaluating the Performance of the Itoyori AMT using TaskBench**

Summer Semester 2025

- *First examiner.* Duties include preparing the topic, supervising both the technical part and the manuscript, and grading.

30 ECTS

## **M.Sc. Thesis: Development and Evaluation of a new Resource-Adaptive AMT**

Summer Semester 2025

- *First examiner.* Duties include preparing the topic, supervising both the technical part and the manuscript, and grading.

30 ECTS

## **B.Sc. Project: Renewable-Aware Supercomputer Job Scheduling: Malleable Jobs for Nighttime Sustainability**

Summer Semester 2025

- *Principal investigator.* Duties include preparing topics and supervising.

8 ECTS

## **B.Sc. Thesis: Web Technology Fingerprinting: Methods for identifying Frameworks and Libraries**

Summer Semester 2025

- *Second examiner.* Duties include grading.

15 ECTS

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## **B.Sc. Lecture: Programming and Modelling**

Winter Semester 2024/2025

- *Principal investigator.* Duties include giving lectures, organizing exercises, and taking oral exams.

6 ECTS

## **B.Sc. Lecture: Design Patterns**

Winter Semester 2024/2025

- *Principal investigator.* Duties include giving lectures, organizing exercises, and taking oral exams.

6 ECTS

## **B.Sc. & M.Sc. Seminar: Generative AI in Software and Algorithm Development**

Winter Semester 2024/2025

- *Principal investigator.* Duties include preparing topics and grading student manuscripts as well as presentations.

6 ECTS

## **B.Sc. Thesis: Dynamic Resource Management: Comparison of MPI-DPP and APGAS+GLB**

Winter Semester 2024/2025

- *First examiner.* Duties include preparing the topic, supervising both the technical part and the manuscript, and grading.

15 ECTS

## **B.Sc. Thesis: Simulation and Evaluation of evolving Workloads**

Winter Semester 2024/2025

- *First examiner.* Duties include preparing the topic, supervising both the technical part and the manuscript, and grading.

15 ECTS

## **B.Sc. Thesis: Simulating Malleable Job Scheduling Algorithms using Real-World Supercomputer Trace Logs**

Winter Semester 2024/2025

- *First examiner.* Duties include preparing the topic, supervising both the technical part and the manuscript, and grading.

15 ECTS

## **B.Sc. Thesis: Evaluation of Gemini-generated End-To-End and Unit Tests for Web Applications**

Winter Semester 2024/2025

- *First examiner.* Duties include supervising both the technical part and the manuscript, and grading.

15 ECTS

## **B.Sc. Thesis: Bundler vs. CDN: A comparison of JavaScript delivery methods regarding performance**

Winter Semester 2024/2025

- *Second examiner.* Duties include grading.

15 ECTS

<b>B.Sc. Lecture: Algorithms and Data Structures</b> <ul style="list-style-type: none"> <li>Duties includes giving exercises as well as creating and correcting weekly worksheets.</li> </ul>	<i>Summer Semester 2024</i> 6 ECTS
<b>B.Sc. &amp; M.Sc. Seminar: History and Evolution of Supercomputing - From the Beginnings to the Exascale Era</b> <ul style="list-style-type: none"> <li><i>Principal investigator.</i> Duties include preparing topics and grading student manuscripts as well as presentations.</li> </ul>	<i>Summer Semester 2024</i> 6 ECTS
<b>B.Sc. Thesis: Development of a Material Workflow System for Batch Processing of Materials on Virtual Production Systems</b> <ul style="list-style-type: none"> <li>Duties include supervising both the technical part and the manuscript.</li> </ul>	<i>Summer Semester 2024</i> 15 ECTS
<b>M.Sc. Project: MPI Sessions for Resource Adaptivity</b> <ul style="list-style-type: none"> <li><i>Principal investigator.</i> Duties include preparing topics and supervising.</li> </ul>	<i>Summer Semester 2024</i> 8 ECTS
<b>B.Sc. Lecture: Introduction to Parallel Processing</b> <ul style="list-style-type: none"> <li><i>Principal investigator.</i> Topics include shared memory, distributed memory, and GPUs. Duties include giving lectures, designing exercises, and taking oral exams.</li> </ul>	<i>Winter Semester 2023/2024</i> 6 ECTS
<b>B.Sc. Thesis: Evolving Task-based Parallel Programming Systems</b> <ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising both the technical part and the manuscript.</li> </ul>	<i>Winter Semester 2023/2024</i> 15 ECTS
<b>B.Sc. Practical Lecture: Building a Miniature Supercomputer</b> <ul style="list-style-type: none"> <li><i>Principal investigator.</i> Full design of this new course. Topics include Linux, git, Docker, and Slurm. Duties include giving lectures, designing exercises, and taking oral exams.</li> </ul>	<i>Summer Semester 2023</i> 6 ECTS
<b>M.Sc. Thesis: TasGPI: A Global Load Balancing framework for C++</b> <ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising both the technical part and the manuscript.</li> </ul>	<i>Summer Semester 2023</i> 30 ECTS
<b>B.Sc. Thesis: Evaluation of Malleable Job Scheduling Algorithms via Simulations</b> <ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising both the technical part and the manuscript.</li> </ul>	<i>Summer Semester 2023</i> 15 ECTS
<b>B.Sc. Project: Evaluation of Real-world Supercomputer Trace Logs with Malleable Job Scheduling Algorithms via Simulations</b> <ul style="list-style-type: none"> <li><i>Principal investigator.</i> Duties include preparing topics and supervising.</li> </ul>	<i>Summer Semester 2023</i> 12 ECTS
<b>B.Sc. Lecture: Introduction to Parallel Processing</b> <ul style="list-style-type: none"> <li>Responsible for 75% of the lecture. Topics include shared memory and distributed memory. Duties include giving lectures, designing exercises, and taking oral exams.</li> </ul>	<i>Winter Semester 2022/2023</i> 6 ECTS
<b>M.Sc. Lecture: Parallel Programming</b> <ul style="list-style-type: none"> <li>Responsible for the part “Introduction to Charm++”. Duties include giving lectures, designing exercises, and taking oral exams.</li> </ul>	<i>Winter Semester 2022/2023</i> 6 ECTS
<b>B.Sc. &amp; M.Sc. Seminar: State-of-the-Art and Trends of High Performance Computing</b> <ul style="list-style-type: none"> <li>Held in cooperation with a co-worker. Duties include preparing topics and grading student manuscripts as well as presentations.</li> </ul>	<i>Winter Semester 2022/2023</i> 6 ECTS
<b>B.Sc. Thesis: Benchmarking of Virtual Threads in Java 19</b> <ul style="list-style-type: none"> <li><i>Principal investigator.</i> Duties include preparing the topic and supervising the technical part.</li> </ul>	<i>Winter Semester 2022/2023</i> 15 ECTS

<b>B.Sc. Project: Building a Slurm Cluster using Docker</b> <ul style="list-style-type: none"> <li>Principal investigator. Duties include preparing the topic and supervising the technical part.</li> </ul>	<i>Winter Semester 2022/2023</i> 12 ECTS
<b>B.Sc. Project: Installation and Evaluation of several OpenSHMEM Implementations</b> <ul style="list-style-type: none"> <li>Principal investigator. Duties include preparing the topic and supervising the technical part.</li> </ul>	<i>Winter Semester 2022/2023</i> 12 ECTS
<b>B.Sc. &amp; M.Sc. Seminar: State of the Art and Trends of High Performance Computing</b> <ul style="list-style-type: none"> <li>Principal investigator. Duties include preparing topics and grading student manuscripts as well as presentations.</li> </ul>	<i>Summer Semester 2022</i> 6 ECTS
<b>B.Sc. Thesis: Integrating of APGAS into the Benchmark Suite TaskBench</b> <ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising both the technical part and the manuscript.</li> </ul>	<i>Summer Semester 2022</i> 15 ECTS
<b>B.Sc. Lecture: Introduction to Parallel Processing</b> <ul style="list-style-type: none"> <li>Responsible for 25% of the lecture. Topics include distributed memory. Duties include giving lectures, designing exercises, and taking oral exams.</li> </ul>	<i>Winter Semester 2021/2022</i> 6 ECTS
<b>B.Sc. &amp; M.Sc. Seminar: Task-based Parallel Programming-Systems</b> <ul style="list-style-type: none"> <li>Held in cooperation with a co-worker. Duties include preparing topics and grading student manuscripts as well as presentations.</li> </ul>	<i>Winter Semester 2021/2022</i> 6 ECTS
<b>M.Sc. Lecture: Parallel Programming</b> <ul style="list-style-type: none"> <li>Responsible for the part "Introduction to Charm++". Duties include giving lectures, designing exercises, and taking oral exams.</li> </ul>	<i>Summer Semester 2021</i> 6 ECTS
<b>B.Sc. Lecture: Introduction to Parallel Processing</b> <ul style="list-style-type: none"> <li>Responsible for 75% of the lecture. Topics include shared memory and distributed memory. Duties include giving lectures, designing exercises, and taking oral exams.</li> </ul>	<i>Winter Semester 2020/2021</i> 6 ECTS
<b>B.Sc. &amp; M.Sc. Seminar: Task-based Parallel Programming-Systems</b> <ul style="list-style-type: none"> <li>Held in cooperation with a co-worker. Duties include preparing topics and grading student manuscripts as well as presentations.</li> </ul>	<i>Winter Semester 2020/2021</i> 6 ECTS
<b>B.Sc. Project: Implementating Benchmarks in Chapel, Legion, and Charm++</b> <ul style="list-style-type: none"> <li>Principal investigator. Duties include preparing topics and supervising.</li> </ul>	<i>Winter Semester 2020/2021</i> 12 ECTS
<b>M.Sc. Thesis: Implementing a MPI Transport Layer for APGAS</b> <ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising the technical part.</li> </ul>	<i>Winter Semester 2020/2021</i> 30 ECTS
<b>B.Sc. &amp; M.Sc. Seminar: The Future of Java</b> <ul style="list-style-type: none"> <li>Held in cooperation with a co-worker. Duties include preparing topics and grading student manuscripts as well as presentations.</li> </ul>	<i>Summer Semester 2020</i> 6 ECTS
<b>M.Sc. Thesis: Implementing Resource Elasticity for Global Task Pools in APGAS</b> <ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising the technical part.</li> </ul>	<i>Summer Semester 2020</i> 30 ECTS
<b>M.Sc. Project: Implementation of Reduce and Broadcast Algorithms with APGAS</b> <ul style="list-style-type: none"> <li>Principal investigator. Duties include preparing topics and supervising.</li> </ul>	<i>Summer Semester 2020</i> 8 ECTS
<b>B.Sc. Project: Analysis of APGAS programs using Likwid</b> <ul style="list-style-type: none"> <li>Principal investigator. Duties include preparing topics and supervising.</li> </ul>	<i>Summer Semester 2020</i> 12 ECTS



<b>B.Sc. Project: Evaluation of the Naos Network Interface</b>	<i>Summer Semester 2020</i>
<ul style="list-style-type: none"> <li>Principal investigator. Duties include preparing topics and supervising.</li> </ul>	12 ECTS
<b>B.Sc. &amp; M.Sc. Seminar: Java Concurrency</b>	<i>Winter Semester 2019/2020</i>
<ul style="list-style-type: none"> <li>Held in cooperation with a co-worker. Duties include preparing topics and grading student manuscripts as well as presentations.</li> </ul>	6 ECTS
<b>M.Sc. Lecture: Parallel Programming</b>	<i>Winter Semester 2019/2020</i>
<ul style="list-style-type: none"> <li>Responsible for the part “Introduction to Charm++”. Duties include giving lectures, designing exercises, and taking oral exams.</li> </ul>	6 ECTS
<b>B.Sc. Lecture: Introduction to Parallel Processing</b>	<i>Summer Semester 2019</i>
<ul style="list-style-type: none"> <li>Responsible for 50% of the lecture. Topics include distributed memory and GPUs. Duties include giving lectures, designing exercises, and taking oral exams.</li> </ul>	6 ECTS
<b>B.Sc. Lecture: Algorithms and Data Structures</b>	<i>Summer Semester 2019</i>
<ul style="list-style-type: none"> <li>Duties include giving exercises.</li> </ul>	6 ECTS
<b>M.Sc. Project: Implementation of Reduce and Broadcast Algorithms with APGAS</b>	<i>Summer Semester 2019</i>
<ul style="list-style-type: none"> <li>Principal investigator. Duties include preparing the topic and supervising.</li> </ul>	8 ECTS
<b>M.Sc. Thesis: Design and Evaluation of a Work Stealing-Based Fault Tolerance Scheme for Task Pools</b>	<i>Summer Semester 2019</i>
<ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising the technical part.</li> </ul>	30 ECTS
<b>B.Sc. Thesis: Isolation of HPC Applications using Shifter and Singularity</b>	<i>Summer Semester 2019</i>
<ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising the technical part.</li> </ul>	15 ECTS
<b>B.Sc. Thesis: Comparison of Charm++ and APGAS</b>	<i>Summer Semester 2019</i>
<ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising the technical part.</li> </ul>	15 ECTS
<b>B.Sc. Thesis: Comparison of Akka and APGAS</b>	<i>Summer Semester 2019</i>
<ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising the technical part.</li> </ul>	15 ECTS
<b>B.Sc. Project: Solving the Travelling Salesmen Problem with APGAS</b>	<i>Summer Semester 2019</i>
<ul style="list-style-type: none"> <li>Principal investigator. Duties include preparing topics and supervising.</li> </ul>	12 ECTS
<b>M.Sc. Lecture: Parallel Programming</b>	<i>Winter Semester 2018/2019</i>
<ul style="list-style-type: none"> <li>Responsible for the part “Introduction to Charm++”. Duties include giving lectures, designing exercises, and taking oral exams.</li> </ul>	6 ECTS
<b>B.Sc. &amp; M.Sc. Seminar: Script Languages</b>	<i>Winter Semester 2018/2019</i>
<ul style="list-style-type: none"> <li>Held in cooperation with a co-worker. Duties include preparing topics and grading student manuscripts as well as presentations.</li> </ul>	6 ECTS
<b>B.Sc. Thesis: Logging and Visualization of a Distributed Task Pool</b>	<i>Winter Semester 2018/2019</i>
<ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising the technical part.</li> </ul>	15 ECTS
<b>B.Sc. Project: Solving the Queen Domination Problem with APGAS</b>	<i>Winter Semester 2018/2019</i>
<ul style="list-style-type: none"> <li>Principal investigator. Duties include preparing topics and supervising.</li> </ul>	12 ECTS
<b>B.Sc. Project: Programming with Robocode</b>	<i>Winter Semester 2018/2019</i>
<ul style="list-style-type: none"> <li>Principal investigator. Duties include preparing topics and supervising.</li> </ul>	12 ECTS

<b>B.Sc. Lecture: <i>Introduction to Parallel Processing</i></b> <ul style="list-style-type: none"> <li>Responsible for 25% of the lecture. Topics include distributed memory. Duties include giving lectures, designing exercises, and taking oral exams.</li> </ul>	<i>Summer Semester 2018</i> 6 ECTS
<b>B.Sc. &amp; M.Sc. Seminar: <i>Java Concurrency</i></b> <ul style="list-style-type: none"> <li>Held in cooperation with a co-worker. Duties include preparing topics and grading student manuscripts as well as presentations.</li> </ul>	<i>Summer Semester 2018</i> 6 ECTS
<b>M.Sc. Thesis: <i>Using Fibers in APGAS</i></b> <ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising the technical part.</li> </ul>	<i>Summer Semester 2018</i> 30 ECTS
<b>B.Sc. Thesis: <i>An Asynchronous Backup Scheme Tracking Work-Stealing for Reduction-Based Task Pools</i></b> <ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising the technical part.</li> </ul>	<i>Summer Semester 2018</i> 30 ECTS
<b>B.Sc. Thesis: <i>Solving the Knapsack Problem with APGAS</i></b> <ul style="list-style-type: none"> <li>Duties include preparing the topic and supervising the technical part.</li> </ul>	<i>Summer Semester 2018</i> 15 ECTS
<b>B.Sc. Project: <i>Installation and Configuration of a Checkpoint/Restart Library</i></b> <ul style="list-style-type: none"> <li><i>Principal investigator.</i> Duties include preparing topics and supervising.</li> </ul>	<i>Summer Semester 2018</i> 12 ECTS
<b>B.Sc. Project: <i>Regular Applications with APGAS</i></b> <ul style="list-style-type: none"> <li><i>Principal investigator.</i> Duties include preparing topics and supervising.</li> </ul>	<i>Summer Semester 2018</i> 12 ECTS
<b>B.Sc. Lecture: <i>Introduction to Parallel Processing</i></b> <ul style="list-style-type: none"> <li>Responsible for 25% of the lecture. Topics include distributed memory. Duties include giving lectures, designing exercises, and taking oral exams.</li> </ul>	<i>Summer Semester 2017</i> 6 ECTS
<b>B.Sc. Lecture: <i>Introduction to Programming</i></b> <ul style="list-style-type: none"> <li>Student tutor and homework supervisor.</li> </ul>	<i>Winter Semesters 2011–2016</i> 6 ECTS
<b>B.Sc. Lecture: <i>Algorithms and Data Structures</i></b> <ul style="list-style-type: none"> <li>Student tutor and homework supervisor.</li> </ul>	<i>Summer Semesters 2012–2016</i> 6 ECTS

## Service to Profession

<b>Supercomputing Conference 2025</b> <ul style="list-style-type: none"> <li><i>Programming Frameworks and System Software</i> Technical Papers Program Committee Member</li> <li><i>Research Posters</i> Committee Member</li> </ul>	2025
<b>Supercomputing Conference 2024</b> <ul style="list-style-type: none"> <li><i>Research Posters</i> Committee Member</li> <li>Mentor in the <i>Mentor-Protégé Program</i></li> </ul>	2024
<b>Supercomputing Conference 2023</b> <ul style="list-style-type: none"> <li><i>Programming Frameworks and System Software</i> Technical Papers Program Committee Member</li> <li><i>Birds of a Feather (BoF)</i> Committee Member</li> <li><i>HPC Illuminations Pavilion</i> Committee Member</li> <li>Mentor in the <i>Mentor-Protégé Program</i></li> </ul>	2023
<b>Supercomputing Conference 2022</b> <ul style="list-style-type: none"> <li><i>Birds of a Feather (BOF)</i> Committee Member</li> <li><i>AD/AE Appendices</i> Committee Member</li> <li>Reviewer for the Student Volunteers Program</li> </ul>	2022

## Supercomputing Conference 2021

2021

- Lead Student Volunteer (SCALE)
- *Birds of a Feather (BOF)* Committee Member
- *Guided Group of Interest (GIG)* Committee Member
- Reviewer for the Student Volunteers Program

## Guest Editor

2025

- Invited Editor for the journal “*Recent advances in Asynchronous Many Task Runtime Systems*” published in Springer Nature Computer Science

## University of Kassel

2022

- Selection committee member for the professorship *Automation and Sensor Technology in Network Systems*

## Program Committee Member

2018–PRESENT

- Workshop on Dynamic Resources in HPC (DynResHPC) at EuroPar (2025)
- Parallel Applications Workshop, Alternatives To MPI+X (PAW-ATM) at SC. Artifact Evaluation (2025)
- ISC High Performance Workshops (2024)
- International Conference on Compiler Construction (CC) Artifact Evaluation (2024)
- Workshop on Language-Based Parallel Programming Models (WLPP) at PPAM (since 2024)
- Workshop on Asynchronous Many-Task Systems and Applications (WAMTA) (since 2024)
- Workshop on Asynchronous Many-Task Systems for Exascale (AMTE) at EuroPar (since 2024)
- Workshop on Performance and Energy Efficiency in Concurrent and Distributed Systems (PECS) at HPDC (2024)
- Workshop on Advances in Parallel and Distributed Computational Models (APDCM) at IPDPS (since 2018)
- International Symposium on Computing and Networking (CANDAR) (2018–2023)

## Invited Reviewer

2018–PRESENT

- EuroHPC Posters and Demos
- Concurrency and Computation: Practice and Experience
- Future Generation Computer Systems (FGCS)
- The Journal of Supercomputing
- International Journal of Networking and Computing (IJNC)

## Lead Student Volunteer

2019–2021

- Supercomputing Conference, SC21, St. Louis (U.S.)
- Supercomputing Conference, SC20, online
- Supercomputing Conference, SC19, Denver (U.S.)

## Student Volunteer

2017–2019

- ISC High Performance, ISC19, Frankfurt (Germany)
- Supercomputing Conference, SC18, Dallas (U.S.)
- Supercomputing Conference, SC17, Denver (U.S.)

# Further Scientific Qualifications

## Training as an Education Coach

2025

UNIVERSITY OF KASSEL, GERMANY

*Period of one year with a total of 80 hours of training*

## Effective Doctoral Supervision

2023–2024

UNIVERSITY OF KASSEL, GERMANY

## Qualification Program *quali.prof@haw*: On the Way to a Professorship

2022–2023

UNIVERSITY OF APPLIED SCIENCES FULDA AND UNIVERSITY OF KASSEL, GERMANY

Comprising the following modules:

- Leadership: Time Management and Communication for Leaders
- HAW Professorship Expert Discussions
- University Governance: Current Developments and Challenges of the University Landscape
- Design and Management of Application-Related Projects

## Efficient Parallel Programming with GASPI

2022

PRACE, ONLINE

## DFG Proposal Writing Workshop

2022

UNIVERSITY OF KASSEL, GERMANY

## Programming Distributed Computing Platforms with COMPSs

2021

PRACE, ONLINE

## Parallelization with MPI and OpenMP

2020

PRACE, ONLINE

## Marie Skłodowska-Curie Actions (MSCA) Postdoctoral Fellowships

2020

UNIVERSITY OF KASSEL, GERMANY

## Role Management in Science: Responsibly Shaping Working Relationships Shape

2020

UNIVERSITY OF KASSEL, GERMANY

## Postdoc Wanted–Planning and Optimizing your University Career

2019

UNIVERSITY OF KASSEL, GERMANY

## Grant Proposal Writing

2019

UNIVERSITY OF KASSEL, GERMANY

## Professional Memberships

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ACM Member

2017–PRESENT