

Dr. André Bauer

University of Chicago

✉ andre.bauer@uchicago.edu | 🌐 <https://bauer-research.net>

RESEARCH INTEREST

My research aims to expand the potential of data science in scientific computing. To this end, my research contributes to key aspects of developing intuitive, efficient, and sustainable data science solutions across disciplines and domains.

ACADEMIC CAREER

Argonne National Laboratory

ASSOCIATED RESEARCHER

Lemont, United States

since January 2023

University of Chicago

POSTDOCTORAL SCHOLAR (PROF. IAN FOSTER)

Chicago, United States

since November 2022

University of Würzburg

RESEARCH GROUP LEADER (PROF. SAMUEL KOUNEV)

Würzburg, Germany

January 2021 — October 2022

University of Würzburg

RESEARCH ASSISTANT

Würzburg, Germany

October 2016 — December 2020

SCHOOL & ACADEMIC EDUCATION

University of Würzburg

DR. RER. NAT. (COMPUTER SCIENCE)

Würzburg, Germany

October 2016 — December 2020

- **Dissertation** “Automated Hybrid Time Series Forecasting: Design, Benchmarking, and Use Cases”
- **Advisor** Prof. Dr. Samuel Kounev
- **Grade** Summa cum laude (1.0) — *Defense December 22, 2020*

University of Würzburg

MASTER OF SCIENCE IN COMPUTER SCIENCE

Würzburg, Germany

October 2014 — September 2016

Blekinge Institute of Technology

SEMESTER ABROAD (ERASMUS PROGRAM)

Karlskrona, Sweden

August 2015 — January 2016

University of Würzburg

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

Würzburg, Germany

October 2012 — October 2014

AWARDS & SCHOLARSHIPS

GAIN Participation Grant, German Academic International Network

The GAIN conference connects internationally mobile German scientists with representatives from the scientific community, politics, and industry.

Bonn, Germany

May 2023

2023 SPECTacular Award, Standard Performance Evaluation Corporation (SPEC)

The SPECTacular Award is given to individuals who have significantly exceeded expectations in their contributions to SPEC.

Gainesville, United States

February 2023

Leadership Academy Fellowship, German Scholars Organization

The Leadership Academy Fellowship is awarded to 25 outstanding researchers from all disciplines.

Berlin, Germany

January 2023

SPEC Kaivalya Dixit Distinguished Dissertation Award, SPEC

The SPEC Kaivalya Dixit Distinguished Dissertation Award is an annual award recognizing one outstanding doctoral dissertation within the scope of the SPEC Research Group in terms of scientific originality, scientific significance, practical relevance, impact, and presentation.

Gainesville, United States

April 2022

Distinguished Dissertation Award, Faculty of Mathematics and Computer Science

The Distinguished Dissertation Award is an annual award for outstanding dissertations from the Faculty of Mathematics and Computer Science.

Würzburg, Germany

July 2021

Dissertation Award, Unterfränkische Gedenkjahrstiftung für Wissenschaft

The Dissertation Award is an annual award for outstanding dissertations from all disciplines.

Würzburg, Germany

May 2021

Summa cum laude, University of Würzburg

Grading of the doctoral thesis ‘Automated Hybrid Time Series Forecasting: Design, Benchmarking, and Use Cases’.

Würzburg, Germany

December 2020

Winner of the FameLab State of Bavaria final, British Council

In this science communication competition, researchers must present their work in three minutes in an understandable and humorous way.

Regensburg, Germany

March 2020

Sokrates/Erasmus Grant, University of Würzburg

Mobility grant for a semester abroad in Sweden.

Würzburg, Germany

August 2015 — January 2016

Deutschlandstipendium, University of Würzburg

The Deutschlandstipendium supports talented and high-achieving students, taking into account not only first-class grades but also social commitment and special personal achievements.

Würzburg, Germany

October 2014 — September 2015

Heinrich-Thein Award, Heinrich-Thein-Stiftung

Award for talented students pursuing the “second-chance education”.

Haßfurt, Germany

November 2009

FUNDING**Google Research Grant (\$1,000), Google**

Acquisition of Google Cloud credits for the project “Performance Analysis and Prediction of Microservices in Cloud Environments”.

March 2023

DFG Research Grant (\$347,235), Deutsche Forschungsgemeinschaft e.V.

Applicant and PI for the project “MINERVA: Performance Prediction of Microservice Applications with Black-box Container Orchestration”, starting in October 2023, with a project duration of 3 years.

January 2023

Industrial project, DATEV eG

Assistance for the extension of the project “Self-Configuring Autoscaler” (\$30,068), with a project duration of 3 months.

May 2022

Industrial project, DATEV eG

Assistance with the application of the project “Self-Configuring Autoscaler” (\$71,200), with a project duration of 6 months.

July 2021

Normalverfahren Grant 2021 (\$3,234), Universitätsbund Würzburg

Acquisition of the Normalverfahren Grant for the project “Prediction of Winter Mortality of Bee Colonies Using Machine Learning”.

April 2021

SELECTED PUBLICATIONS (74 TOTAL)

A. Bauer, T. Dittus, M. Straesser, A. Kamatar, M. Baughman, L. Beierlieb, M. Hadry, D. Grillmeyer, Y. Lubas, S. Kounev, I. Foster, and K. Chard. “Unveiling Temporal Performance Deviation: Leveraging Clustering in Microservices Performance Analysis”. In: *Companion of the 15th ACM/SPEC International Conference on Performance Engineering (ICPE)*. 2024.

A. Bauer, H. Pan, R. Chard, Y. Babuji, J. Bryan, D. Tiwari, I. Foster, and K. Chard. “The Globus Compute Dataset: An Open Function-as-a-Service Dataset From the Edge to the Cloud”. In: *Future Generation Computer Systems* 153 (2024).

A. Bauer, M. Straesser, M. Leznik, L. Beierlieb, M. Hadry, N. Hudson, K. Chard, S. Kounev, and I. Foster. “Searching for the Ground Truth: Assessing the Similarity of Benchmarking Runs”. In: *Companion of the 14th ACM/SPEC International Conference on Performance Engineering (ICPE)*. 2023.

M. Straesser, **A. Bauer**, R. Leppich, N. Herbst, K. Chard, I. Foster, and S. Kounev. “An Empirical Study of Container Image Configurations and Their Impact on Start Times”. In: *Proceedings of the 23rd IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing (CCGRID)*. 2023.

A. Bauer, M. Züfle, S. Eismann, J. Grohmann, N. Herbst, and S. Kounev. “Libra: A Benchmark for Time Series Forecasting Methods”. In: *Proceedings of the 12th ACM/SPEC International Conference on Performance Engineering (ICPE)*. 2021.

A. Bauer, M. Züfle, N. Herbst, A. Zehe, A. Hotho, and S. Kounev. “Time Series Forecasting for Self-Aware Systems”. In: *Proceedings of the IEEE* 108.7 (2020).

A. Bauer, M. Züfle, N. Herbst, S. Kounev, and V. Curtef. “Telescope: An Automatic Feature Extraction and Transformation Approach for Time Series Forecasting on a Level-Playing Field”. In: *Proceedings of the 36th IEEE International Conference on Data Engineering (ICDE)*. 2020.

A. Bauer, M. Züfle, J. Grohmann, N. Schmitt, N. Herbst, and S. Kounev. “An Automated Forecasting Framework based on Method Recommendation for Seasonal Time Series”. In: *Proceedings of the 11th ACM/SPEC International Conference on Performance Engineering (ICPE)*. 2020.

A. Bauer, V. Lesch, L. Versluis, A. Ilyushkin, N. Herbst, and S. Kounev. “Chamulleon: Coordinated Auto-Scaling of Micro-Services”. In: *Proceedings of the 39th IEEE International Conference on Distributed Computing Systems (ICDCS)*. 2019.

A. Bauer, N. Herbst, S. Spinner, A. Ali-Eldin, and S. Kounev. “Chameleon: A Hybrid, Proactive Auto-Scaling Mechanism on a Level-Playing Field”. In: *IEEE Transactions on Parallel and Distributed Systems (TPDS)* 30.4 (2018).

SCIENCE COMMUNICATION COMPETITIONS

1st South Side Science Festival Science Slam

UNIVERSITY OF CHICAGO

Chicago, USA

September 2023

6th GAIN Science Slam

GERMAN ACADEMIC INTERNATIONAL NETWORK

Boston, USA

August 2023

21st Stuttgart Science Slam

LUUPS

Stuttgart, Germany

October 2022

FameLab State of Bavaria final

BRITISH COUNCIL

Regensburg, Germany

March 2021

6th Alumni-Science Slam

UNIVERSITY OF WÜRZBURG

Würzburg, Germany

November 2020

FameLab German final

BRITISH COUNCIL

Bielefeld, Germany

May 2020

FameLab State of Bavaria final

BRITISH COUNCIL

Regensburg, Germany

March 2020

14th Munich Science Slam

LUUPS

Munich, Germany

February 2020

33rd Dortmund Science Slam

LUUPS

Dortmund, Germany

November 2019

INVITED TALKS

Academic Success: Navigating your Journey

UNIVERSITY OF CHICAGO

Chicago, US

February 2024

Smart Infrastructure Management: Navigating Efficiency in Scientific Computing

ILLINOIS INSTITUTE OF TECHNOLOGY

Chicago, US

November 2023

Why Auto-Scaling Still Matters

DEPAUL UNIVERSITY

Chicago, US

October 2023

Towards an Intelligent Infrastructure for Data Science Clouds

CHALMERS UNIVERSITY OF TECHNOLOGY

Edmonton, Canada

May 2023

Autonomous Data Analytic Clouds

CHALMERS UNIVERSITY OF TECHNOLOGY

Gothenburg, Sweden

February 2023

A Short Overview of Auto-Scaling & Why It Is Not Yet Solved

MONGODB

Virtual meeting

April 2022

Measuring Energy-Efficiency in Digital Systems

HASSO-PLATTNER-INSTITUT

Potsdam, Germany

March 2022

TEACHING ACTIVITIES

Distributed Systems, University of Chicago

Co-Lecturer with Prof. Kyle Chard of this master’s course (English).

Chicago, United States

September 2023 — December 2023

Time Series Analysis and Forecasting, University of Würzburg

Lecturer of this self-created master’s course (English).

Würzburg, Germany

April 2022 — September 2022

Advance Programming, University of Würzburg

Co-Lecturer with Prof. Samuel Kounev of this master’s course (English).

Würzburg, Germany

October 2021 — March 2022

Computer Science: Getting Started, University of Würzburg

Co-Lecturer with Prof. Samuel Kounev of this bachelor’s course (German).

Würzburg, Germany

April 2021 — September 2021

Operating Systems, University of Würzburg

Co-Lecturer with Dr. Nikolas Herbst of this bachelor's/master's course (German).

Würzburg, Germany

October 2020 — March 2021

Software-Engineering Seminar, University of Würzburg

Instructor of this bachelor's/master's course (German).

Würzburg, Germany

October 2016 — March 2021

Operating Systems (Exercise), University of Würzburg

Coordinator & instructor of this bachelor's/master's course (German).

Würzburg, Germany

October 2016 — March 2021

Practical Course in Software, University of Würzburg

Coordinator & instructor of this bachelor's course (German).

Würzburg, Germany

October 2016 — September 2020

ACADEMIC SERVICE

Organization committee

- The International Conference on Performance Engineering 2024 (Data Challenge)
- The International Conference on Performance Engineering 2024 (Posters and Demos)
- The Second International Workshop on Performance-Data Analytics and Data-Management
- The First International Workshop on Performance-Data Analytics and Data-Management

since July 2024

August 2023 — May 2024

October 2022 — February 2023

October 2021 — April 2022

Program committee

- Symposium on Software Performance 2024
- International Conference on Performance Engineering 2025
- International Conference on e-Science 2024
- Int'l Conference on Autonomic Computing and Self-Organizing Systems 2024
- International conference on Time Series and Forecasting 2024
- International Conference on Performance Engineering 2024
- International Symposium on Cluster, Cloud and Internet Computing 2024
- International conference on Data Science Technology and Applications 2024
- International Conference on Cloud Computing and Services Science 2024
- International Conference on Utility and Cloud Computing 2024
- Symposium on Software Performance 2023
- Int'l Conference on Autonomic Computing and Self-Organizing Systems 2023 (Posters and Demos)
- International Conference on Data Science Technology and Applications 2023
- International Conference on Time Series and Forecasting 2023
- International Symposium on Cluster, Cloud and Internet Computing 2023
- International Conference on Utility and Cloud Computing 2022
- Int'l Conference on Autonomic Computing and Self-Organizing Systems 2022 (Posters and Demos)
- Symposium on Software Performance 2022
- International conference on Time Series and Forecasting 2022
- International Conference on Performance Engineering 2020 (Artefact Evaluation)
- Workshop on Evaluations and Measurements in Self-Aware Computing Systems 2019

since July 2024

since June 2024

since April 2024

since March 2024

January 2024 — July 2024

December 2023 — May 2024

November 2023 — May 2024

November 2023 — June 2024

August 2023 — May 2024

July 2023 — December 2023

June 2023 — November 2023

May 2023 — September 2023

March 2023 — July 2023

February 2023 — July 2023

November 2022 — May 2023

June 2022 — December 2022

June 2022 — September 2022

April 2022 — November 2022

April 2022 — July 2022

March 2019 — April 2020

January 2019 — June 2019

Publicity chair

- International Conference on Performance Engineering 2020
- Workshop on Evaluations and Measurements in Self-Aware Computing Systems 2019

November 2018 — April 2020

January 2019 — June 2019

Standard Performance Evaluation Corporation

- Founder and chair of the SPEC RG Predictive Data Analytics Working Group
- Elected editor of the annual SPEC RG newsletter
- Elected release manager of the SPEC RG Cloud Working Group

since June 2021

April 2017 — May 2023

October 2018 — May 2021

REVIEWING ACTIVITIES

Journals

- SoftwareX
- Journal of Grid Computing
- Transactions on Knowledge and Data Engineering
- Journal of Grid Computing
- Science of Computer Programming
- Transactions on Autonomous and Adaptive Systems
- Empirical Software Engineering
- Empirical Software Engineering
- Journal of Systems & Software
- Transactions on Cloud Computing
- Transactions on Services Computing
- Journal of Parallel and Distributed Computing
- Journal of Future Generation Computer Systems
- Transactions on Network and Service Management
- Journal of Systems and Software

February 2024

November 2023

September 2023

July 2023

July 2023

June 2023

May 2023

November 2022

September 2022

May 2021

February 2020

December 2019

March 2019

November 2018

March 2018

Conferences

- International Conference on e-Science 2024 *July 2024*
- Int'l Conference on Autonomic Computing and Self-Organizing Systems 2024 *June 2024*
- International conference on Data Science Technology and Applications 2024 *April 2024*
- International Symposium on Cluster, Cloud and Internet Computing 2024 *March 2024*
- International Conference on Cloud Computing and Services Science 2024 *February 2024*
- International Conference on Time Series and Forecasting 2024 *February 2024*
- International Conference on Performance Engineering 2024 *December 2023*
- International Conference on Utility and Cloud Computing 2023 *October 2023*
- Symposium on Software Performance 2023 *September 2023*
- Int'l Conference on Autonomic Computing and Self-Organizing Systems 2023 *July 2022*
- International Conference on Time Series and Forecasting 2023 *March 2022*
- International Symposium on Cluster, Cloud and Internet Computing 2023 *January 2023*
- International Conference on Utility and Cloud Computing 2022 *October 2022*
- Symposium on Software Performance 2022 *September 2022*
- International Conference on Time Series and Forecasting 2022 *April 2022*
- International Conference on Distributed Computing Systems 2021 *February 2021*
- International Symposium on Software Engineering for Adaptive and Self-Managing Systems 2020 *February 2020*
- International Conference on Performance Engineering 2020 *November 2019*
- International Middleware Conference 2019 *June 2019*
- International Conference on Utility and Cloud Computing 2018 *September 2018*
- International Conference on Self-Adaptive and Self-Organizing Systems 2018 *May 2018*
- International Symposium on Software Engineering for Adaptive and Self-Managing Systems 2018 *February 2018*
- International Conference on Dependable Systems and Networks 2018 *January 2018*
- International Conference on Performance Engineering 2018 *November 2017*
- International Conference on Self-Adaptive and Self-Organizing Systems 2017 *June 2017*
- Symposium on Modelling, Analysis, and Simulation of Computer and Telecommunication Systems 2017 *May 2017*
- International Symposium on Software Engineering for Adaptive and Self-Managing Systems 2017 *February 2017*
- International Conference on Software Engineering 2017 *January 2017*
- International Conference on Performance Engineering 2017 *November 2016*

CERTIFICATES

- Certificate of Leadership – Smart Skills** National Postdoctoral Association *January 2024*
- Certificate Leadership** University of Würzburg *October 2022*
- Certificate Academic Teaching – State of Bavaria** University of Würzburg *November 2020*
- Certificate Academic Teaching – University of Würzburg** University of Würzburg *December 2019*

VOLUNTARY ACTIVITIES

- Pen Pal Program** *Chicago, United States*
OFFICE OF DIVERSITY AND INCLUSION UNIVERSITY OF CHICAGO *since February 2023*
- Mentoring for students** *Würzburg, Germany*
ALUMNIVEREIN UNIVERSITY OF WÜRZBURG *November 2019 – October 2022*
- Supervision of scouts** *Würzburg, Germany*
SCHWARZER HAUFEN WÜRZBURG (BDP E.V.) *July 2019 – February 2020*
- Volunteer tutoring** *Würzburg, Germany*
NACHBARSCHAFTSHILFE GROMBÜHL *September 2013 – September 2014*
- Student council** *Schweinfurt, Germany*
FRIEDRICH-FISCHER SCHULE *September 2010 – August 2011*
- Volunteer fire brigade** *Horhausen, Germany*
FFW HORHAUSEN E.V. *April 2003 – August 2009*

LANGUAGES

- German** Mother tongue
- English** Fluent