

# Maximilian Weininger

Researcher


06. September 1994

*https://mweininger.github.io/*

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## Languages

Greek
1

English
5

German
6

[The scale is from 1 (Beginner) to 6 (Expert).]

## Education

2018-2022 Ph.D. in Computer Science @ Technical University of Munich
Chair for Foundations of Software Reliability and Theoretical Computer Science under the supervision of Jan Kretinsky
Passed with summa cum laude

2015-2017 M.Sc. Informatics @ Technical University of Munich
Focus on formal methods, computer networks and databases
Passed with high distinction

2012-2015 B.Sc. Informatics @ Technical University of Munich
Passed with merit

2004-2012 Josef-Hofmiller-Gymnasium, Freising
Natural-science and technology track
Passed with high distinction

## Working Experience

since 2025 Researcher @ Ruhr University of Bochum
Chair of Artificial Intelligence and Formal Methods, project *DEUCE*

2023-2025 Researcher @ Institute of Science and Technology Austria
Chatterjee Group: Computer-Aided Verification, Game Theory

2018-2023 Researcher @ Technical University of Munich
Chair for Foundations of Software Reliability and Theoretical Computer Science

2014-2017 Student tutor @ Technical University of Munich
Introduction to theoretical computer science (2017)
Foundations of networks and distributed systems (2014, 2015)
Foundations of database systems (2014, 2016)

2015-2016 Assistant researcher @ Technical University of Munich
Developing the interface of *ProteomicsDB*
Chair of Proteomics and Bioanalytics

## Publication Summary

Conference papers: 33

Journal papers: 8

h-index: 14 (*Scopus*, accessed 12.10.26) / 18 (*Google Scholar*)

Total citations: 626 (*Scopus*) / 1159 (*Scholar*)

## Grant Writing Experience

2024 *Fit4Funding* course
Austrian Research Promotion Agency

2023 *IST-BRIDGE fellowship* — 177,000 Euro
Marie Skłodowska-Curie COFUND program for excellent researchers

# Tools

dtControl:
Representing controllers concisely and explainably.

Click here for the *website* or *latest publication*.

Automata Tutor:
Teaching theoretical computer science to undergraduate students.

Click here for the *website* or *publication*.

PET:
Quantitative verification of probabilistic systems using partial exploration.

Click here for the *gitlab* or *latest publication*.

PRISM-extensions:
Algorithms for solving stochastic games reliably.

Click here for the *github* or recent *related publication*.

# Hobbies

- Dog sports (Trickdog, Agility, Mantrailing)
- Music (Listening, composing and playing guitar or drums)
- Computer games
- Tabletop role-playing games

# Awards

2025 ETAPS Distinguished Paper Award 2025
For the paper "Sound Statistical Model Checking for Probabilities and Expected Rewards"

2024 CAV Distinguished Paper Award 2024
For the paper "Playing Games with your PET: Extending the Partial Exploration Tool to Stochastic Games"

2023 Award for the Best Doctoral Thesis of the Department of Computer Science in 2023
Technical University of Munich

2020 *Best video award*
Eleventh International Symposium on Games, Automata, Logics, and Formal Verification

2017 Admission to the *best.in.tum* program
Technical University of Munich

2012 Admission to the *Max-Weber* program
German National Academic Foundation

# Community Service

Committee Memberships:

- Co-organized Dagstuhl Research Meeting "*Challenges in Robust Decision-Making Under Uncertainty*"
- *AAAI'26* and AAAI'27 Program Committee
- *VeriProP'25* Organizer
- *RP'24* Program Committee
- *CAV'24* Artifact Evaluation Committee
- *ETAPS'22* Organizer (Website Chair and Local Staff)
- *FOMEO'21* and *FOMEO'22* Organizer and Program Committee
- *TACAS'19* and *TACAS'20* Artifact Evaluation Committee

Internal Organization:

- Research retreat (2018 and 2021) of TUM's I-7 Chair
- Regular research group seminar (July 2020 until May 2023)

Review Activities:

Conferences: AAAI'26/27, ACC'25, ADT'24, ATVA'20/23, CONCUR'20/21/22/25, FORMATS'19, FoSSaCS'23/25, GandALF'20, HSCC'20, ICALP'23, ICTAC'18/19/20, LICS'22, MFCS'21/24, QEST'18/20/21, STACS'25, TACAS'19/20/22/23/25, VeriProP'25, VMCAI'19/21/22

Journals: Annals of Operations Research (24), Dynamic Games and Applications (24/25), European Journal of Control (25), Information Processing Letters (23/24), Theoretical Computer Science (25), JAIR (26)

## Teaching

Main Organizer or Lecturer:

- Lecture “Model Checking” (RUB, 2025, ∼20 students)
- Tutorial “Multi-objective Model Checking of Probabilistic Systems” (ISTA, 2024, ∼20 students)
- Practical Course “Recent Advances in Model Checking” (TUM, 2022 and 2023, each ∼10 students)
- Class “Introduction to Databases” (secondary school Grund- und Mittelschule Zolling, 2022, ∼30 pupils and 2 teachers)
- Lecture “Theoretical Computer Science” for high school teachers (TUM, 2021 and 2022, each ∼50 teachers)
- Seminar “Recent Advances in Model Checking” (TUM, 2022, ∼10 students)
- Seminar “Security and Verification” (TUM, 2020, ∼10 students)
- Exercises “Introduction to Theoretical Computer Science” (TUM, 2018, ∼1000 students)

Other teaching:

- Guest lecturer for “Programming For Modern Machine Learning” (RUB, 2025, ∼20 students)
- Supervisor for seminar “Safety and Reliability in Artificial Intelligence” (RUB, 2025 and 2026, ∼10 students)
- Tutor, teaching two groups of 30 students and assisting with exam correction for various courses (TUM, 2014-2020, “Algorithms for Programming Contests”, “Discrete Structures”, “Introduction to Theoretical Computer Science”, “Foundations of Networks and Distributed Systems”, “Foundations of Database Systems”)

Supervision:

- 10 Bachelor’s Theses, 4 Master’s Theses, 2 Interdisciplinary Projects, 9 Student assistants, and 2 Interns with 11 joint publications resulting from student supervision
- Co-supervision of 9 PhD-students (4 TUM, 1 ISTA, 5 RUB)

Project lead and developer of the teaching tool *Automata Tutor* used by more than 50 universities around the world.

## Publication List

Remark on author ordering: For all my publications except those in fields outside of theoretical computer science [J01, C04, C13], the order of authors is alphabetic and hence has no relation to the contribution of the authors.

### Journal Publications

[J08] STTT (2026)
Revised Practitioner’s Guide to MDP Model Checking Algorithms
Hartmanns, A., Junges, S., Quatmann, T. & Weininger, M.

[J07] TOOLympics (2024)
Tools at the Frontiers of Quantitative Verification (QComp 2023 Competition Report)
Andriushchenko, R., Bork, A., Budde, C. E., Ceska, M., Grover, K., Hahn, E. M., Hartmanns, A., Israelsen, B., Jansen, N., Jeppson, J., Junges, S., Köhl, M. A., Könighofer, B., Kretinsky, J., Meggendorfer, T., Parker, D., Pranger, S., Quatmann, T., Ruijters, E., Taylor, L., Volk, M., Weininger, M. & Zhang, Z.

[J06] STTT (2023)
Algebraically Explainable Controllers: Decision Trees and Support Vector Machines Join Forces
Jüngermann, F., Kretinsky, J. & Weininger, M.

[J05] FORM (2023)
Stochastic Games with Lexicographic Objectives
Chatterjee, K., Katoen, J., Mohr, S., Weininger, M. & Winkler, T.

[J04] Inf. and Comp. (2022)
Comparison of algorithms for simple stochastic games
Kretinsky, J., Ramneantu, E., Slivinskiy, A. & Weininger, M.

[J03] Inf. and Comp. (2022)
Value iteration for simple stochastic games: Stopping criterion and learning algorithm
Eisentraut, J., Kelmendi, E., Kretinsky, J. & Weininger, M.

[J02] Acta Informatica (2021)
Index appearance record with preorders
Kretinsky, J., Meggendorfer, T., Waldmann, C. & Weininger, M.

[J01] Nature methods (2017)
Building ProteomeTools based on a complete synthetic human proteome
Zolg, D. P., Wilhelm, M., ..., Weininger, M., ..., & Küster, B.

## Conference Publications

[C33] FMCAD'26
dtControl2+ $\varepsilon$: Trading Optimality for Explainability in MDPs via Decision Trees
Kinská, T., Křetínský, J., Meggendorfer, T., Rieder, S., & Weininger, M.

[C32] FMCAD'26
Property-driven causal abstractions for Markov decision processes
Schmidt, J., Weininger, M., Dubslaff, C., Parker, D., & Jansen, N.

[C31] IJCAI'26
Missingness-MDPs: Bridging the Theory of Missing Data and POMDPs
Wendland, J., Zubia, M., Andriushchenko, R., Galesloot, M. F., Ceska, M., von Kleist, H., Simão, T. D., Weininger, M., & Jansen, N.

[C30] AAMAS'26
Perception-Based Beliefs for POMDPs with Visual Observations
Schäfers, M., Krale, M., Simão, T. D., Jansen, N., & Weininger, M.

[C29] GandALF'25
Sound value iteration for simple stochastic games
Azeem, M., Kretinsky, J., & Weininger, M.

[C28] QEST'25
What are the odds? improving statistical model checking of Markov decision processes
Meggendorfer, T., Weininger, M., & Wienhöft, P.

[C27] QEST'25
Statistical model checking beyond means: Quantiles, CVaR, and the DKW inequality
Budde, C. E., Hartmanns, A., Meggendorfer, T., Weininger, M., & Wienhöft, P.

[C26] LICS'25
Risk-aware Markov Decision Processes Using Cumulative Prospect Theory
Brihaye, T., Chatterjee, K., Mohr, S., & Weininger, M.

[C25] LICS'25
Stopping Criteria for Value Iteration on Concurrent Stochastic Reachability and Safety Games
Grobelna, M., Kretinsky, J., & Weininger, M.

[C24] TACAS'25
Fixed Point Certificates for Reachability and Expected Rewards in MDPs
Chatterjee, K., Quatmann, T., Schäffeler, M., Weininger, M., Winkler, T., & Zilken, D.

[C23] TACAS'25
Sound Statistical Model Checking for Probabilities and Expected Rewards
Budde, C. E., Hartmanns, A., Meggendorfer, T., Weininger, M., & Wienhöft, P.

[C22] AAAI'25
Solving Robust Markov Decision Processes: Generic, Reliable, Efficient
Meggendorfer, T., Weininger, M., & Wienhöft, P.

[C21] VMCAI'25
1–2–3–Go! Policy Synthesis for Parameterized Markov Decision Processes via Decision-Tree Learning and Generalization
Azeem, M., Chakraborty, D., Kanav, S., Kretinsky, J., Mohagheghi, M., Mohr, S., & Weininger, M.

[C20] CAV'24
Playing Games with your PET: Extending the Partial Exploration Tool to Stochastic Games
Meggendorfer, T., & Weininger, M.

[C19] LICS'23
Stopping Criteria for Value Iteration on Stochastic Games with Quantitative Objectives
Kretinsky, J., Meggendorfer, T. & Weininger, M.

[C18] TACAS'23
A Practitioner's Guide to MDP Model Checking Algorithms
Hartmanns, A., Junges, S., Quatmann, T. & Weininger, M.

[C17] CONCUR'22
Anytime Guarantees for Reachability in Uncountable Markov Decision Processes
Grover, K., Kretinsky, J., Meggendorfer, T. & Weininger, M.

[C16] ATVA'22
Optimistic and Topological Value Iteration for Simple Stochastic Games
Azeem, M., Evangelidis, A., Kretinsky, J., Slivinskiy, A. & Weininger, M.

[C15] TACAS'21
dtControl 2.0: Explainable Strategy Representation via Decision Tree Learning Steered by Experts
Ashok, P., Jackermeier, M., Kretinsky, J., Weinhuber, C., Weininger, M. & Yadav, M.

[C14] CONCUR'21
Enforcing omega-Regular Properties in Markov Chains by Restarting
Esparza, J., Kiefer, S., Kretinsky, J. & Weininger, M.

[C13] CDC'21
Guaranteed Trade-Offs in Dynamic Information Flow Tracking Games
Weininger, M., Grover, K., Misra, S. & Kretinsky, J.

[C12] GandALF'21
Stochastic Games with Disjunctions of Multiple Objectives.
Winkler, T. & Weininger, M.

[C11] HSCC'20
dtControl: decision tree learning algorithms for controller representation
Ashok, P., Jackermeier, M., Jagtap, P., Kretinsky, J., Weininger, M. & Zamani, M.

[C10] Isola'20
Statistical Model Checking: Black or White?
Ashok, P., Daca, P., Kretinsky, J. & Weininger, M.

[C09] GandALF'20
Comparison of Algorithms for Simple Stochastic Games
Kretinsky, J., Ramneantu, E., Slivinskiy, A. & Weininger, M.

[C08] CAV'20
Stochastic Games with Lexicographic Reachability-Safety Objectives
Chatterjee, K., Katoen, J., Weininger, M. & Winkler, T.

[C07] CAV'20
Automata Tutor v3
D'Antoni, L., Helfrich, M., Kretinsky, J., Ramneantu, E. & Weininger, M.

[C06] LICS'20
Approximating Values of Generalized-Reachability Stochastic Games
Ashok, P., Chatterjee, K., Kretinsky, J., Weininger, M. & Winkler, T.

[C05] QEST'19
SOS: Safe, Optimal and Small Strategies for Hybrid Markov Decision Processes
Ashok, P., Kretinsky, J., Larsen, K.G., Le Coënt, A., Taankvist, J.H. & Weininger, M.

[C04] CDC'19
Satisfiability Bounds for omega-Regular Properties in Bounded-Parameter Markov Decision Processes
Weininger, M., Meggendorfer, T. & Kretinsky, J.

[C03] CAV'19
PAC Statistical Model Checking for Markov Decision Processes and Stochastic Games
Ashok, P., Kretinsky, J. & Weininger, M.

[C02] CAV'18
Value Iteration for Simple Stochastic Games: Stopping Criterion and Learning Algorithm
Kelmendi, E., Krämer, J., Kretinsky, J. & Weininger, M.

[C01] TACAS'17
Index appearance record for transforming Rabin automata into parity automata
Kretinsky, J., Meggendorfer, T., Waldmann, C. & Weininger, M.