

Djordje ZIKELIC

School of Computing and Information Systems
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Education

PhD, Institute of Science & Technology Austria, Austria, 2023
Bachelor of Arts, University of Cambridge, Great Britain, 2018
Master of Mathematics, University of Cambridge, Great Britain, 2018

Academic Appointments

Assistant Professor of Computer Science, School of Computing and Information Systems, SMU, Jan 2024 - Present

Awards and Honors

Top Reviewer, 39th Conference on Neural Information Processing Systems, 2025
Distinguished Tool Paper Award, 23rd International Symposium on Automated Technology for Verification and Analysis, 2025
Distinguished Paper Award, 26th International Symposium on Formal Methods, 2024
Distinguished Reviewer Award, 10th International Symposium on Dependable Software Engineering: Theories, Tools and Applications, 2024
Outstanding PhD Thesis, Institute of Science and Technology Austria (ISTA), 2024
Outstanding Scientific Achievement, Institute of Science and Technology Austria (ISTA), 2023
Meta PhD Research Fellowship - finalist, Meta, 2022

RESEARCH

Research Interests

Formal Methods
Trustworthy AI
Programming Languages
Probabilistic Verification

Publications

Journal Articles [Refereed]

Quantitative bounds on resource usage of probabilistic programs, by CHATTERJEE, Krishnendu; GOHARSHADY, Amir Kafshdar; MEGGENDORFER, Tobias; ZIKELIC, Dorde. (2024). *Proceedings of the ACM on Programming Languages*, 8 (OOPSLA), 362-391. <https://doi.org/10.1145/3649824> (Published)

Equivalence and similarity refutation for probabilistic programs, by CHATTERJEE, Krishnendu; GOHARSHADY, Ehsan Kafshdar; NOVOTNY, Petr; ZIKELIC, Dorde. (2024). *Proceedings of the ACM on Programming Languages*, 8 (PLDI), 2098-2122. <https://doi.org/10.1145/3656462> (Published)

On lexicographic proof rules for probabilistic termination, by CHATTERJEE, Krishnendu; GOHARSHADY, Ehsan Kafshdar; NOVOTNY, Petr; ZÁREVUCKÝ, Jiří; ZIKELIC, Dorde. (2023). *Formal Aspects of Computing*, 35 (2), 1-25. <https://doi.org/10.1145/3585391> (Published)

Social balance on networks: Local minima and best-edge dynamics, by CHATTERJEE, Krishnendu; SVOBODA, Jakub; ZIKELIC, Dorde; PAVLOGIANNIS, Andreas; TKADLEC, Josef. (2022). *Physical Review E (statistical, nonlinear, biological, and soft matter physics)*, 106 (3), 1-13. <https://doi.org/10.1103/physreve.106.034321> (Published)

Bidding mechanisms in graph games, by AVNI, Guy; HENZINGER, Thomas A.; ZIKELIC, Dorde. (2021). *Journal of Computer and System Sciences*, 119 133-144. <https://doi.org/10.1016/j.jcss.2021.02.008> (Published)

Theorems about quadrilaterals and conics, by BARALIC, Dorde; GRBIC, Branko; ZIKELIC, Dorde. (2014). *International Journal of Computer Mathematics*, 91 (7), 1407-1421. <https://doi.org/10.1080/00207160.2013.844338> (Published)

Conference Proceedings

PolyQEnt: A polynomial quantified entailment solver, by CHATTERJEE, Krishnendu; GOHARSHADY, Amir Kafshdar; GOHARSHADY, Ehsan Kafshdar; KARRABI, Mehrdad; SAADAT, Milad; SEELIGER, Maximilian; ŽIKELIĆ, Đorđe. (2025.0). *Proceedings of the 23rd International Symposium, ATVA 2025, Bengaluru, India, October 27-31*, (pp. 411-424) Cham: Springer. https://doi.org/10.1007/978-3-032-08707-2_19 (Published)

Omega-regular verification and control for distributional specifications in MDPs, by S. Akshay, Ouldouz Neysari, Đorđe Žikelić. (2025.0). *Proceedings of the 36th International Conference on Concurrency Theory (CONCUR 2025). Leibniz International Proceedings in Informatics (LIPIcs)*, Aarhus, Denmark, August 26-29, (pp. 1-19) Aarhus, Denmark: <https://doi.org/10.4230/LIPIcs.CONCUR.2025.6> (Published)

LP-based weighted model integration over non-linear real arithmetic, by AKSHAY, S.; CHAKRABORTY, Supratik; FAROKHNA, Soroush; GOHARSHADY, Amir; MOTWANI, Harshit J; ŽIKELIĆ, Đorđe. (2025.0). *Proceedings of the Thirty-Fourth International Joint Conference on Artificial Intelligence, Montreal, Canada, 2025 August 16-22*, (pp. 1-9) Montreal, Canada: IJCAI. <https://doi.org/10.24963/ijcai.2025/1005> (Published)

Supermartingale certificates for quantitative omega-regular verification and control, by HENZINGER, Thomas A.; MALLIK, Kaushik; SADEGHI, Pouya; ŽIKELIĆ, Đorđe. (2025.0). *Proceedings of the 37th International Conference, CAV 2025, Zagreb, Croatia, July 23-25*, (pp. 29-55) Cham: Springer. https://doi.org/10.1007/978-3-031-98679-6_2 (Published)

Predictive monitoring of black-box dynamical systems, by HENZINGER, Thomas A.; KRESSE, Fabian; MALLIK, Kaushik; YU, Emily; ŽIKELIĆ, Đorđe. (2025.0). *Proceedings of the 7th Annual Learning for Dynamics & Control Conference, PMLR 283, Ann Arbor, MI, USA, 2025 June 4-6*, (pp. 1-13) Ann Arbor, MI, USA: <https://proceedings.mlr.press/v283/henzinger25a.html> (Published)

Refuting equivalence in probabilistic programs with conditioning, by CHATTERJEE, Krishnendu; GOHARSHADY, Ehsan Kafshdar; NOVOTNY, Petr; ŽIKELIĆ, Đorđe. (2025.0). *Proceedings of the 31st International Conference, TACAS 2025 Held as Part of the International Joint Conferences on Theory and Practice of Software, ETAPS 2025, Hamilton, Canada, May 3-8*, (pp. 279-300) Cham: Springer. https://doi.org/10.1007/978-3-031-90653-4_14 (Published)

Neural control and certificate repair via runtime monitoring, by Emily Yu, Đorđe Žikelić, Thomas A. Henzinger. (2025.0). *AAAI'25/IAAI'25/EAAI'25: Proceedings of the Thirty-Ninth AAAI Conference on*

Artificial Intelligence and Thirty-Seventh Conference on Innovative Applications of Artificial Intelligence and Fifteenth Symposium on Educational Advances in Artificial Intelligence, Philadelphia, Pennsylvania, February 25 - March 4, (pp. 26409-26417) New York: ACM. <https://doi.org/10.1609/aaai.v39i25.34840> (Published)

Quantified linear and polynomial arithmetic satisfiability via template-based Skolemization, by CHATTERJEE, Krishnendu; GOHARSHADY, Ehsan Kafshdar; KARRABI, Mehrdad; MOTWANI, Harshit J; SEELIGER, Maximilian; ZIKELIĆ, Đorđe. (2025.0). *AAAI'25/IAAI'25/EAAI'25: Proceedings of the Thirty-Ninth AAAI Conference on Artificial Intelligence and Thirty-Seventh Conference on Innovative Applications of Artificial Intelligence and Fifteenth Symposium on Educational Advances in Artificial Intelligence, Philadelphia, Pennsylvania, February 25 - March 4, (pp. 11158-11166) New York: ACM. <https://doi.org/10.1609/aaai.v39i11.33213> (Published)*

Sound and complete witnesses for template-based verification of LTL properties on polynomial programs, by CHATTERJEE, Krishnendu; GOHARSHADY, Amir; GOHARSHADY, Ehsan; KARRABI, Mehrdad; ZIKELIĆ, Đorđe. (2024.0). *Proceedings of the 26th International Symposium, FM 2024, Milan, Italy, 2024 September 9-13, (pp. 600-619) Cham: Springer. https://doi.org/10.1007/978-3-031-71162-6_31 (Published)*

Certified policy verification and synthesis for MDPs under distributional reach-avoidance properties, by AKSHAY, S.; CHATTERJEE, Krishnendu; MEGGENDORFER, Tobias; ZIKELIĆ, Đorđe. (2024.0). *Proceedings of the Thirty-Third International Joint Conference on Artificial Intelligence, Jeju, Korea, 2024 August 3-9, (pp. 3-12) Jeju, Korea: International Joint Conferences on Artificial Intelligence. <https://doi.org/10.24963/ijcai.2024/1> (Published)*

Solving long-run average reward robust MDPs via stochastic games, by CHATTERJEE, Krishnendu; GOHARSHADY, Ehsan Kafshdar; KARRABI, Mehrdad; NOVOTNÝ, Petr; ZIKELIĆ, Đorđe. (2024.0). *Proceedings of the Thirty-Third International Joint Conference on Artificial Intelligence, Jeju, Korea, 2024 August 3-9, (pp. 6707-6715) Jeju, Korea: IJCAI. <https://doi.org/10.24963/ijcai.2024/741> (Published)*

Fully automated selfish mining analysis in efficient proof systems blockchains, by CHATTERJEE, Krishnendu; EBRAHIMZADEH, Amrali; KARRABI, Mehrdad; PIETRZAK, Krzysztof; YEO, Michelle; ZIKELIC, Đorđe. (2024.0). *PODC '24: Proceedings of the 43rd ACM Symposium on Principles of Distributed Computing, Nantes, France, June 17-21, (pp. 268-278) New York: ACM. <https://doi.org/10.1145/3662158.3662769> (Published)*

Compositional policy learning in stochastic control systems with formal guarantees, by ZIKELIC, Đorđe; LECHNER, Mathias; Verma, Abhinav; CHATTERJEE, Krishnendu; HENZINGER, Thomas A.. (2024.0). *Proceedings of the 37th Conference on Neural Information Processing, New Orleans, United States, December 12-14, (pp. 1-25) California: NeurIPS . (Published)*

Stability verification in stochastic control systems via neural network supermartingales, by LECHNER, Mathias; ZIKELIC, Đorđe; CHATTERJEE, Krishnendu; HENZINGER, Thomas A.. (2022.0). *Proceedings of the 36th AAAI Conference on Artificial Intelligence (AAAI-22), Virtual Conference, February 22 - March 1, (pp. 7326-7336) New York: ACM. <https://doi.org/10.1609/aaai.v36i7.20695> (Published)*

Learning provably stabilizing neural controllers for discrete-time stochastic systems, by ANSARIPOUR, Matin; CHATTERJEE, Krishnendu; HENZINGER, A. Thomas; LECHNER, Mathias; ZIKELIC, Đorđe. (2023.0). *Proceedings of the 21st International Symposium, ATVA 2023, Singapore, October 24-27, (pp. 357-379) Cham: Springer. https://doi.org/10.1007/978-3-031-45329-8_17 (Published)*

Learning provably stabilizing neural controllers for discrete-time stochastic systems, by ANSARIPOUR, Matin; CHATTERJEE, Krishnendu; HENZINGER, A. Thomas; LECHNER, Mathias; ZIKELIC, Đorđe. (2023.0). *Proceedings of the 21st International Symposium, ATVA 2023, Singapore, October 24-27, (pp. 357-379) Cham: Springer. https://doi.org/10.1007/978-3-031-45329-8_17 (Published)*

Reachability Poorman discrete-bidding games, by AVNI, Guy; MEGGENDORFER, Tobias; SADHUKHAN, Suman; TKÁDLEC, Josef; ZIKELIC, Đorđe. (2023.0). *Proceedings of the 26th European Conference on Artificial Intelligence (ECAI 2023), Kraków, Poland, September 30 - October 4, (pp. 141-148) Poland: IOS Press. <https://doi.org/10.3233/faia230264> (Published)*

A learner-verifier framework for neural network controllers and certificates of stochastic systems, by CHATTERJEE, Krishnendu; HENZINGER, Thomas A.; LECHNER, Mathias; ZIKELIC, Đorđe . (2023.0). *Proceedings of the 29th International Conference, TACAS 2023, Held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2023, Paris, France, April 22-27, (pp. 3-25)*

Switzerland: Springer. https://doi.org/10.1007/978-3-031-30823-9_1 (Published)

Learning control policies for stochastic systems with reach-avoid guarantees, by ZIKELIC, Dorde; LECHNER, Mathias; HENZINGER, A. Thomas; CHATTERJEE, Krishnendu. (2023.0). *Proceedings of the 37th AAAI Conference on Artificial Intelligence, Washington, DC, 2023 February 7-14*, (pp. 11926-11935) Washington, DC: <https://doi.org/10.1609/aaai.v37i10.26407> (Published)

Bidding graph games with partially-observable budgets, by AVNI, Guy; JECKER, Ismael; ZIKELIC, Dorde. (2023.0). *Proceedings of the 37th AAAI Conference on Artificial Intelligence, Washington, DC, 2023 February 7-14*, (pp. 5464-5471) Washington, DC: <https://doi.org/10.1609/aaai.v37i5.25679> (Published)

Quantization-aware interval bound propagation for training certifiably robust quantized neural networks, by LECHNER, Mathias; ZIKELIC, Dorde; CHATTERJEE, Krishnendu; HENZINGER, A. Thomas; RUS, Daniela. (2023.0). *Proceedings of the 37th AAAI Conference on Artificial Intelligence, Washington, DC, 2023 February 7-14*, (pp. 14964-14973) Washington, DC: <https://doi.org/10.1609/aaai.v37i12.26747> (Published)

Sound and complete certificates for quantitative termination analysis of probabilistic programs, by CHATTERJEE, Krishnendu; GOHARSHADY, Amir Kafshdar; MEGGENDORFER, Tobias; ZIKELIC, Dorde. (2022.0). *Computer Aided Verification: 34th International Conference, CAV 2022, Haifa, Israel, August 7-10*, (pp. 55-78) Cham: Springer. https://doi.org/10.1007/978-3-031-13185-1_4 (Published)

Differential cost analysis with simultaneous potentials and anti-potentials, by ZIKELIC, Dorde; CHANG, Bor-Yuh Evan; BOLIGNANO, Pauline; RAIMONDI, Franco. (2022.0). *PLDI 2022: Proceedings of the 43rd ACM SIGPLAN International Conference on Programming Language Design and Implementation, San Diego, California, June 13-17*, (pp. 442-457) New York: ACM. <https://doi.org/10.1145/3519939.3523435> (Published)

Infinite time horizon safety of Bayesian neural networks, by LECHNER, Mathias; ZIKELIC, Dorde; CHATTERJEE, Krishnendu; HENZINGER, Thomas A.. (2021.0). *NIPS'21: Proceedings of the 35th International Conference on Neural Information Processing Systems, Virtual Conference, December 6-14*, (pp. 10171-10185) New York: Curran Associates, Inc. <https://doi.org/10.5555/3540261.3541039> (Published)

On lexicographic proof rules for probabilistic termination, by CHATTERJEE, Krishnendu; GOHARSHADY, Ehsan Kafshdar; NOVOTNÝ, Petr; ZÁREVUCKÝ, Jiří; ZIKELIC, Dorde. (2021.0). *Proceedings of the 24th International Symposium, FM 2021 Virtual Conference, November 20-26*, (pp. 619-639) Cham: Springer. https://doi.org/10.1007/978-3-030-90870-6_33 (Published)

Proving non-termination by program reversal, by CHATTERJEE, Krishnendu; GOHARSHADY, Ehsan Kafshdar; NOVOTNÝ, Petr; ZIKELIC, Dorde . (2021.0). *PLDI 2021: Proceedings of the 42nd ACM SIGPLAN International Conference on Programming Language Design and Implementation, Virtual Conference, June 20-25*, (pp. 1033-1048) New York: ACM. <https://doi.org/10.1145/3453483.3454093> (Published)

Scalable verification of quantized neural networks, by HENZINGER, Thomas A.; LECHNER, Mathias; ZIKELIC, Dorde. (2021.0). *Proceedings of the Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI-21), Virtual Conference, February 2-9*, (pp. 3787-3795) Washington, DC: AAAI. <https://doi.org/10.1609/aaai.v35i5.16496> (Published)

Infinite-duration all-pay bidding games, by AVNI, Guy; JECKER, Ismael; ZIKELIC, Dorde. (2021.0). *SODA '21: Proceedings of the Thirty-Second Annual ACM-SIAM Symposium on Discrete Algorithms, Virtual Conference, January 10-13*, (pp. 617-636) New York: ACM. <https://doi.org/10.1137/1.9781611976465.38> (Published)

Algorithms and hardness results for computing cores of Markov chains, by AHMADI, Ali; CHATTERJEE, Krishnendu; KAFSHDAR GOHARSHADY, Amir; MEGGENDORFER, Tobias; SAFAVI, Roodabeh; ZIKELIC, Dorde. (2022.0). *Proceedings of the 42nd IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2022), Chennai, India, December 18-20*, (pp. 1-20) Germany: Schloss Dagstuhl. <https://doi.org/10.4230/LIPIcs.FSTTCS.2022.29> (Published)

Bidding mechanisms in graph games, by AVNI, Guy; HENZINGER, Thomas A.; ZIKELIC, Dorde . (2019.0). *Proceedings of the 44th International Symposium on Mathematical Foundations of Computer Science (MFCS 2019), Germany, August 26-30*, (pp. 1-13) Germany: Schloss Dagstuhl. <https://doi.org/10.4230/LIPICS.MFCS.2019.11> (Published)

Optimizing expectation with guarantees in POMDPs, by CHATTERJEE, Krishnendu; PEREZ, Guillermo A.; RASKIN, Jean-François; ZIKELI, Dorde. (2017.0). *AAAI'17: Proceedings of the Thirty-First AAAI Conference*

on Artificial Intelligence, San Francisco, California, February 4-9, (pp. 3725-3732) Washington, DC: AAAI.
<https://doi.org/10.5555/3298023.3298109> (Published)

Stochastic invariants for probabilistic termination, by CHATTERJEE, Krishnendu; NOVOTNÝ, Petr; ZIKELIC, Dorde. (2017.0). *POPL '17: Proceedings of the 44th ACM SIGPLAN Symposium on Principles of Programming Language, Paris, France, January 15-21, (pp. 145-160)* New York: ACM.
<https://doi.org/10.1145/3009837.3009873> (Published)

Research Grants

Singapore Management University

Formal Methods for Safe and Trustworthy Probabilistic Systems, SMU Internal Grant, Ministry of Education (MOE) Tier 1 , PI (Project Level): Djordje ZIKELIC, 2024, S\$90,244

TEACHING

Courses Taught

Singapore Management University

Undergraduate Programmes :

Heuristic Search and Optimisation

Mathematical Foundations of Computing

EXTERNAL SERVICE – PROFESSIONAL

Committee Member, 39th Annual Conference on Neural Information Processing Systems (NeurIPS 2025), 2025

Committee Member, 11th CCF International Symposium on Dependable Software Engineering Theories, Tools and Applications (SETTA 2025), 2025

Committee Chair, Singapore Programming Languages Workshop, 2025

Committee Member, 40th IEEE/ACM International Conference on Automated Software Engineering (ASE 2025), 2025

Committee Member, 28th European Conference on Artificial Intelligence (ECAI 2025), 2025

Committee Member, 34th International Joint Conference on Artificial Intelligence (IJCAI 2025), 2025

Committee Member, 8th International Symposium on AI Verification (SAIV 2025), 2025

Committee Member, 37th International Conference on Computer Aided Verification (CAV 2025), 2025

Committee Member, Programming Languages Mentoring Workshop @ PLDI 2025, 2025

Committee Member, Thirty-Ninth AAAI Conference on Artificial Intelligence (AAAI 2025), 2025

Committee Member, 39th Annual AAAI Conference on Artificial Intelligence (AAAI 2025), 2025

Committee Member, 26th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI 2025), 2025

Committee Member, 10th International Symposium on Dependable Software Engineering: Theories, Tools and Applications (SETTA 2024), 2024

Committee Member, 22nd International Symposium on Automated Technology for Verification and Analysis (ATVA 2024), 2024

Committee Member, 27th European Conference on Artificial Intelligence, 2024

Session Chair, 33rd International Joint Conference on Artificial Intelligence (IJCAI 2024), 2024

Committee Member, 33rd International Joint Conference on Artificial Intelligence (IJCAI 2024), 2024

Committee Member, 38th Annual AAAI Conference on Artificial Intelligence (AAAI 2024), 2024

Session Chair, 21st International Symposium on Automated Technology for Verification and Analysis (ATVA 2023), 2023

Committee Member, 26th European Conference on Artificial Intelligence (ECAI 2023), 2023

Session Chair, Highlights of Logic, Games and Automata 2023, 2023

Invited Lecture, The Workshop on Verification of Probabilistic Programs (VeriProP 2023), 2023

Committee Member, Thirty-Seventh AAAI Conference on Artificial Intelligence (AAAI 2023), 2023