DJORDJE ZIKELIC (ĐORĐE ŽIKELIĆ)

PERSONAL INFORMATION

Address: Am Campus 1, 3400 Klosterneuburg, Austria **Email:** dzikelic@ist.ac.at
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EDUCATION

Institute of Science and Technology Austria (ISTA) *2018 - Present*
Ph.D. in Computer Science
Advisors: Krishnendu Chatterjee, Petr Novotný
Research Interests: Formal verification, Static program analysis, Neural network verification, Learning-based control, Probabilistic programming, Safe reinforcement learning, Game theory

University of Cambridge, UK *2014 - 2018*
Mathematical Tripos, Gonville & Caius College
Bachelor of Arts (BA) and Master of Mathematics (MMath)
Part III essay: *Lagrangians of Hypergraphs*

Mathematical Grammar School, Belgrade, Serbia *2010 - 2014*

INTERNSHIPS

Amazon, UK *August 2022 - October 2022*
Position: Applied Scientist Intern
Team: Prime Video Automated Reasoning & Anomaly Detection and Insights
Project: On-line Automated Threshold Analysis for Time-series Anomaly Detection
Programming: Python

Amazon, UK (virtual) *October 2020 - January 2021*
Position: Applied Scientist Intern
Team: Prime Video Automated Reasoning
Project: Differential cost analysis in programs (PLDI 2022)
Programming: Python, OCaml

University of Cambridge, UK *July 2017 - September 2017*
Position: Research Intern
Supervisor: Alexei Kovalev
Project: Aspects of Morse Theory (study of topics in differential geometry and algebraic topology)

Institute of Science and Technology Austria (ISTA) *June 2016 - September 2016*
Position: Research Intern
Supervisor: Krishnendu Chatterjee, Petr Novotný
Project: Safety analysis in probabilistic programs (POPL 2017), planning under uncertainty (AAAI 2017)
Programming: Matlab

PUBLICATIONS

12 out of 15 conference publications accepted at premier venues according to CSRankings
* equal contribution, † authors ordered alphabetically

Conference publications

1. *Learning Control Policies for Stochastic Systems with Reach-avoid Guarantees.*
Đorđe Žikelić*, Mathias Lechner*, Krishnendu Chatterjee, Thomas A. Henzinger.
To appear in the 37th AAAI Conference on Artificial Intelligence (**AAAI 2023**), **oral presentation**
2. *Quantization-aware Interval Bound Propagation for Training Certifiably Robust Quantized Neural Networks.*
Mathias Lechner, Đorđe Žikelić, Krishnendu Chatterjee, Thomas A. Henzinger, Daniela Rus.
To appear in the 37th AAAI Conference on Artificial Intelligence (**AAAI 2023**), **oral presentation**
3. *Bidding Graph Games with Partially-Observable Budgets.*
Guy Avni, Ismaël Jecker, Đorđe Žikelić†.
To appear in the 37th AAAI Conference on Artificial Intelligence (**AAAI 2023**), **oral presentation**

4. *Algorithms and Hardness Results for Computing Cores of Markov Chains.*
   Ali Ahmadi, Krishnendu Chatterjee, Amir Kafshdar Goharshady, Tobias Meggendorfer, Roodabeh Safavi, Đorđe Žikelić†.
   42nd IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (**FSTTCS 2022**)
5. *Sound and Complete Certificates for Quantitative Termination Analysis of Probabilistic Programs.*
   Krishnendu Chatterjee, Amir Kafshdar Goharshady, Tobias Meggendorfer, Đorđe Žikelić†.
   34th International Conference on Computer Aided Verification (**CAV 2022**)
6. *Differential Cost Analysis with Simultaneous Potentials and Anti-potentials.*
   Đorđe Žikelić, Bor-Yuh Evan Chang, Pauline Bolignano, Franco Raimondi.
   44th ACM SIGPLAN Conference on Programming Language Design and Implementation (**PLDI 2022**)
   Featured in an **Amazon Science blog post**
7. *Stability Verification in Stochastic Control Systems via Neural Network Supermartingales.*
   Mathias Lechner*, Đorđe Žikelić*, Krishnendu Chatterjee, Thomas A. Henzinger.
   36th AAAI Conference on Artificial Intelligence (**AAAI 2022**), **oral presentation**
8. *Infinite Time Horizon Safety of Bayesian Neural Networks.*
   Mathias Lechner*, Đorđe Žikelić*, Krishnendu Chatterjee, Thomas A. Henzinger.
   35th Conference on Neural Information Processing Systems (**NeurIPS 2021**)
9. *On Lexicographic Proof Rules for Probabilistic Termination.*
   Krishnendu Chatterjee, Ehsan Kafshdar Goharshady, Petr Novotný, Jiři Zárevúcky, Đorđe Žikelić†.
   24th International Symposium on Formal Methods (**FM 2021**)
10. *Proving Non-termination by Program Reversal.*
    Krishnendu Chatterjee, Ehsan Kafshdar Goharshady, Petr Novotný, Đorđe Žikelić†.
    43rd ACM SIGPLAN Conference on Programming Language Design and Implementation (**PLDI 2021**)
11. *Scalable Verification of Quantized Neural Networks.*
    Thomas A. Henzinger, Mathias Lechner, Đorđe Žikelić†.
    35th AAAI Conference on Artificial Intelligence (**AAAI 2021**)
12. *Infinite-Duration All-Pay Bidding Games.*
    Guy Avni, Ismaël Jecker, Đorđe Žikelić†.
    ACM-SIAM Symposium on Discrete Algorithms (**SODA 2021**)
13. *Bidding Mechanisms in Graph Games.*
    Guy Avni, Thomas A. Henzinger, Đorđe Žikelić†.
    44th International Symposium on Mathematical Foundations of Computer Science (**MFCS, 2019**)
14. *Optimizing Expectation with Guarantees in POMDPs.*
    Krishnendu Chatterjee, Petr Novotný, Guillermo A. Perez, Jean-Francois Raskin, Đorđe Žikelić†.
    31st AAAI Conference on Artificial Intelligence (**AAAI, 2017**)
15. *Stochastic invariants for probabilistic termination.*
    Krishnendu Chatterjee, Petr Novotný, Đorđe Žikelić†.
    44th ACM SIGPLAN Symposium on Principles of Programming Languages (**POPL, 2017**)

Journal publications

1. *Social balance on networks: Local minima and best-edge dynamics.*
   Krishnendu Chatterjee, Jakub Svoboda, Đorđe Žikelić, Andreas Pavlogiannis, Josef Tkadlec.
   Physical Review E, Vol. 106, No. 3 (**PRE 2022**)
2. *Bidding Mechanisms in Graph Games.*
   Guy Avni, Thomas A. Henzinger, Đorđe Žikelić†.
   Journal of Computer and System Sciences (**JCSS, 2021**)
3. *Theorems about quadrilaterals and conics.*
   Đorđe Baralić, Branko Grbić, Đorđe Žikelić†.
   International Journal of Computer Mathematics 91 (7) (**Int. J. Comput. Math., 2014**)

Workshop publications

1. *Learning Stabilizing Policies in Stochastic Control Systems.*
   Đorđe Žikelić*, Mathias Lechner*, Krishnendu Chatterjee, Thomas A. Henzinger.
   ICLR 2022 Workshop on Socially Responsible Machine Learning (**SRML@ICLR 2022**)

HONOURS AND AWARDS

Meta PhD Research Fellowship - finalist *2022*
Shortlisted as one of the 4 finalists for the programming languages category.

Gonville & Caius College Scholarship and **Cambridge Trust Scholarship** *2014-2018*
Full university fees, tuition fees, and maintenance costs.

Stephen Hawking Fund Award *October, 2017*
Awarded by Gonville & Caius College, Cambridge to mathematics students proceeding to Part III.

Scholar of the Gonville & Cauis College, Cambridge *June 2015, 2016*
High performance in the examinations of the Mathematical Tripos.

International High School Olympiads *2010-2014*
Participated in international high school olympiads in mathematics, physics, and astronomy. Most notable results:

- International Olympiad in Astronomy and Astrophysics (IOAA) 2014 (bronze medal)
- International Mathematical Competition Arhimede 2013 (gold medal), 2012 (silver medal)
- International Junior Science Olympiad (IJSO) 2010 (bronze medal)
- International Astronomy Olympiad (IAO) 2010 (bronze medal)
- International Mathematical Olympiad (IMO) 2014 (first reserve for the Serbian team)

National High School Competitions *2010-2014*

- Serbian Mathematical Olympiad: second prize in 2014, third prize in 2013, 2012
- Mathematics (national): **first overall** in my year in 2014, 2012, 2010, **second overall** in 2013
- Physics (national): first prize in 2013, second prize in 2012, 2011, third prize in 2014
- Astronomy (national): second prize in 2014, 2012

TEACHING

Teaching at ISTA

- Computer Science Track Core Course, TA for Spring 2021.
- Formal Methods, TA for Spring 2020.
- Computer Science Track Core Course, TA for Spring 2020.
- Mathematics Track Core Course, Spring 2019, 4 lectures on Brownian motion and aspects of probability.

Prior to enrolling university, I taught in several preparation classes for mathematical olympiads at the Mathematical High School, Belgrade, as well as at the Mathematical Society "Arhimedes", Belgrade.

SERVICE

- Program Committee: AAAI 2023
- Artifact Evaluation Committee: CAV 2023, CAV 2022
- Reviewer: FoSSaCS 2022, AAMAS 2022, ICML 2022

PROFESSIONAL SKILLS

- Python, C++
- Serbian (native), English (fluent), German (elementary)

PERSONAL SKILLS AND INTERESTS

Strong analytical skills (developed through research and degree activities, maths competitions), hard working
Good organizing skills, value teamwork:

- Co-organized **Young Scientist Symposium 2019** at ISTA May, 2019
- President of the **Cambridge University Serbian Society** 2017-2018

Hobbies and interests: History, travelling, sports (football and tennis), politics, gaming, D&D

REFERENCES

Krishnendu Chatterjee
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