

# DJORDJE ŽIKELIĆ (ĐORĐE ŽIKELIĆ)

## PERSONAL INFORMATION

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**Address:** Am Campus 1, 3400 Klosterneuburg, Austria

**Email:** dzikelic@ist.ac.at

## EDUCATION

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**Institute of Science and Technology (IST) Austria**

*2018 - Present*

Ph.D. in Computer Science

Advisor: Krishnendu Chatterjee

Co-advisor: Petr Novotný, Masaryk University, Czech Republic

Research Interests: Verification, Static program analysis, Neural network verification, Safe reinforcement learning, Probabilistic programming, 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*, supervised by Imre Leader

**Mathematical Grammar School, Belgrade, Serbia**

*2010 - 2014*

## INTERNSHIPS

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**Amazon, UK (virtual)**

*October 2020 - January 2021*

Position: Applied Science Intern

Supervisor: Pauline Bolignano, Bor-Yuh Evan Chang

Project: Differential cost analysis in programs (results under submission to 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 (IST) Austria**

*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

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\* equal contribution, † authors ordered alphabetically

1. *Learning Control Policies for Stochastic Systems with Reach-avoid Guarantees.*  
Đorđe Žikelić\*, Mathias Lechner\*, Krishnendu Chatterjee, Thomas A. Henzinger.  
Submitted to the 39th International Conference on Machine Learning (**ICML 2022**).
2. *Sound and Complete Certificates for Quantitative Termination Analysis of Probabilistic Programs.*  
Krishnendu Chatterjee, Amir Kafshdar Goharshady, Tobias Meggendorfer, Đorđe Žikelić†.  
Submitted to the 34th International Conference on Computer Aided Verification (**CAV 2022**).
3. *Differential Cost Analysis with Simultaneous Potentials and Anti-potentials.*  
Đorđe Žikelić, Pauline Bolignano, Bor-Yuh Evan Chang, Franco Raimondi.  
Submitted to the 43rd ACM SIGPLAN Conference on Programming Language Design and Implementation (**PLDI 2022**).
4. *Stability Verification in Stochastic Control Systems via Neural Network Supermartingales.*  
Mathias Lechner\*, Đorđe Žikelić\*, Krishnendu Chatterjee, Thomas A. Henzinger.  
To appear in the 36th AAAI Conference on Artificial Intelligence (**AAAI 2022**).
5. *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**).

6. *On Lexicographic Proof Rules for Probabilistic Termination.*  
Krishnendu Chatterjee, Ehsan Kafshdar Goharshady, Petr Novotný, Jiří Závěručky, Đorđe Žikelić<sup>†</sup>.  
24th International Symposium on Formal Methods (**FM 2021**)
7. *Proving Non-termination by Program Reversal.*  
Krishnendu Chatterjee, Ehsan Kafshdar Goharshady, Petr Novotný, Đorđe Žikelić<sup>†</sup>.  
43rd ACM SIGPLAN Conference on Programming Language Design and Implementation (**PLDI 2021**)
8. *Scalable Verification of Quantized Neural Networks.*  
Thomas A. Henzinger, Mathias Lechner, Đorđe Žikelić<sup>†</sup>.  
35th AAAI Conference on Artificial Intelligence (**AAAI 2021**)
9. *Infinite-Duration All-Pay Bidding Games.*  
Guy Avni, Ismaël Jecker, Đorđe Žikelić<sup>†</sup>.  
ACM-SIAM Symposium on Discrete Algorithms (**SODA 2021**)
10. *Bidding Mechanisms in Graph Games.*  
Guy Avni, Thomas A. Henzinger, Đorđe Žikelić<sup>†</sup>.  
44th International Symposium on Mathematical Foundations of Computer Science (**MFCS, 2019**)  
Journal version in Journal of Computer and System Sciences (**JCSS, 2021**)
11. *Optimizing Expectation with Guarantees in POMDPs.*  
Krishnendu Chatterjee, Petr Novotný, Guillermo A. Perez, Jean-Francois Raskin, Đorđe Žikelić<sup>†</sup>.  
31st AAAI Conference on Artificial Intelligence (**AAAI, 2017**)
12. *Stochastic invariants for probabilistic termination.*  
Krishnendu Chatterjee, Petr Novotný, Đorđe Žikelić<sup>†</sup>.  
44th ACM SIGPLAN Symposium on Principles of Programming Languages (**POPL, 2017**)
13. *Theorems about quadrilaterals and conics.*  
Đorđe Baralić, Branko Grbić, Đorđe Žikelić<sup>†</sup>.  
International Journal of Computer Mathematics 91 (7) (**Int. J. Comput. Math., 2014**)

## HONOURS AND AWARDS

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

**Marie Skłodowska-Curie Fellowship** 2018 - 2020  
Awarded to best candidates for the IST Austria PhD program.

**Gonville & Caius College Scholarship and Cambridge Trust Scholarhip** 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 & Caius 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 on 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

## SUPERVISION AND TEACHING

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Supervision of interns and students at IST Austria:

- Roodabeh Safavi (Sharif University of Technology, Iran) spring 2022.
- Martin Ansari pour (Sharif University of Technology, Iran), winter-spring 2022.
- Mehrdad Karrabi (PhD student at IST Austria), autumn 2021.
- Ehsan Kafshdar Goharshady (Ferdowsi University of Mashhad, Iran), summer 2019.

Teaching at IST Austria:

- 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.

## CONFERENCE AND INVITED TALKS

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• NeurIPS 2021, virtual (recorded talk and poster)	December 2021
• IST/FORSYTE joint seminar, virtual	December 2021
• FM 2021, virtual (talk)	November 2021
• PLDI 2021, virtual (recorded talk and poster)	June 2021
• Infer Practitioners Workshop (co-located with PLDI 2021), virtual	June 2021
• IST/FORSYTE joint seminar, virtual	May 2021
• AAI 2021, virtual (poster)	January 2021
• Mathematical Institute of the Serbian Academy of Science and Arts, Belgrade, Serbia	December 2019
• MFCS 2019, Aachen, Germany (talk)	August 2019

## SERVICE

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

## PROFESSIONAL SKILLS

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

## PERSONAL SKILLS AND INTERESTS

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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 IST Austria 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

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**Krishnendu Chatterjee**

Institute of Science and Technology (IST) Austria  
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**Petr Novotný**

Masaryk University, Czech Republic  
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**Bor-Yuh Evan Chang**

University of Colorado Boulder & Amazon  
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**Thomas A. Henzinger**

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