

# DJORDJE ZIKELIC (ĐORĐE ŽIKELIĆ)

## PERSONAL INFORMATION

---

**Address:** Am Campus 1, 3400 Klosterneuburg, Austria  
**Website:** <https://djordjezikelic.github.io/>

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

## EDUCATION

---

**Institute of Science and Technology Austria (ISTA)** *2018 - Present*  
Ph.D. in Computer Science  
Advisors: Krishnendu Chatterjee, Petr Novotný  
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*

**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

---

9 out of 12 conference publications accepted at premier venues according to CSRankings

\* equal contribution, † authors ordered alphabetically

### Conference publications

1. *Algorithms and Hardness Results for Computing Cores of Markov Chains.*  
Ali Ahmadi, Krishnendu Chatterjee, Amir Kafshdar Goharshady, Tobias Meggendorfer, Roodabeh Safavi, Đorđe Žikelić<sup>†</sup>.  
42nd IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (**FSTTCS 2022**)
2. *Sound and Complete Certificates for Quantitative Termination Analysis of Probabilistic Programs.*  
Krishnendu Chatterjee, Amir Kafshdar Goharshady, Tobias Meggendorfer, Đorđe Žikelić<sup>†</sup>.  
34th International Conference on Computer Aided Verification (**CAV 2022**)

3. *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**
4. *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**
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†.  
24th International Symposium on Formal Methods (**FM 2021**)
7. *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**)
8. *Scalable Verification of Quantized Neural Networks.*  
Thomas A. Henzinger, Mathias Lechner, Đorđe Žikelić†.  
35th AAAI Conference on Artificial Intelligence (**AAAI 2021**)
9. *Infinite-Duration All-Pay Bidding Games.*  
Guy Avni, Ismaël Jecker, Đorđe Žikelić†.  
ACM-SIAM Symposium on Discrete Algorithms (**SODA 2021**)
10. *Bidding Mechanisms in Graph Games.*  
Guy Avni, Thomas A. Henzinger, Đorđe Žikelić†.  
44th International Symposium on Mathematical Foundations of Computer Science (**MFCS, 2019**)
11. *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**)
12. *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**)

#### Under submission

1. *Quantitative Bounds on Resource Usage of Probabilistic Programs.*  
Krishnendu Chatterjee, Amir Kafshdar Goharshady, Tobias Meggendorfer, Đorđe Žikelić†.
2. *Learning Control Policies for Region Stabilization in Stochastic Systems.*  
Matin Ansarpour\*, Mathias Lechner\*, Đorđe Žikelić\*, Krishnendu Chatterjee, Thomas A. Henzinger.
3. *Quantization-aware Interval Bound Propagation for Training Certifiably Robust Quantized Neural Networks.*  
Mathias Lechner, Đorđe Žikelić, Krishnendu Chatterjee, Thomas A. Henzinger, Daniela Rus.

4. *Learning Control Policies for Stochastic Systems with Reach-avoid Guarantees.*  
Đorđe Žikelić\*, Mathias Lechner\*, Krishnendu Chatterjee, Thomas A. Henzinger.
5. *Bidding Graph Games with Partially-Observable Budgets.*  
Guy Avni, Ismaël Jecker, Đorđe Žikelić†.

## 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 & 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 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 AND SUPERVISION

---

### 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.

### Supervision of interns at ISTA

- Amirali Ebrahim-zadeh, Sharif University Summer 2022  
*Analyzing Selfish Mining in Proof of Space-based Blockchain Protocols*
- Matin Ansari-pour, Sharif University Spring 2022  
*Learning Control Policies for Region Stabilization in Stochastic Systems* (under submission)
- Roodabeh Safavi, Sharif University Spring 2022  
*Algorithms and Hardness Results for Computing Cores of Markov Chains* (FSTTCS 2022)
- Ehsan Kafshdar Goharshady, Ferdowsi University of Mashhad Summer 2020  
*Proving Non-termination by Program Reversal* (PLDI 2021)

## SERVICE

---

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

## CONFERENCE AND INVITED TALKS

---

- CAV 2022, Haifa, Israel August 2022

• EPFL, Lausanne, Switzerland	July 2022
• PLDI 2022, San Diego, US	June 2022
• Masaryk University, Brno, Czech Republic	April 2022
• AAAI 2022, virtual (recorded talk)	February 2022
• NeurIPS 2021, virtual (recorded talk)	December 2021
• ISTA/FORSYTE joint seminar, virtual	December 2021
• FM 2021, virtual	November 2021
• PLDI 2021, virtual (recorded talk)	June 2021
• Infer Practitioners Workshop (co-located with PLDI 2021), virtual	June 2021
• ISTA/FORSYTE joint seminar, virtual	May 2021
• AAAI 2021, virtual (poster)	January 2021
• Mathematical Institute of the Serbian Academy of Science and Arts, Belgrade, Serbia	December 2019
• MFCS 2019, Aachen, Germany	August 2019

## 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

Institute of Science and Technology Austria (ISTA)  
krishnendu.chatterjee@ist.ac.at

### Petr Novotný

Masaryk University, Czech Republic  
petr.novotny@fi.muni.cz

### Bor-Yuh Evan Chang

University of Colorado Boulder & Amazon  
byec@amazon.com

### Thomas A. Henzinger

Institute of Science and Technology Austria (ISTA)  
tah@ist.ac.at

### Pauline Bolignano

Amazon  
pln@amazon.co.uk