

PERSONAL DATA

Born November 16, 1997

Nationality Slovak

EDUCATION

Technische Universität Dresden

Dresden, Germany

PhD in Mathematics (subject area *Algebra and Discrete Structures*)

2021–2025

- thesis: *Valued Constraint Satisfaction in Structures with an Oligomorphic Automorphism Group* (supervisor Manuel Bodirsky)

Charles University

Prague, Czech Republic

Master in Pure Mathematics (program *Mathematical Structures*)

2019–2021

- summa cum laude
- thesis: *Higher commutators in loop theory* (supervisor David Stanovský)

Charles University

Prague, Czech Republic

Bachelor in Mathematics (program *General Mathematics*)

2016–2019

- summa cum laude
- thesis: *Enumeration of affine quasigroups* (supervisor David Stanovský)

RESEARCH INTERESTS

- constraint satisfaction problems (CSPs): valued CSPs, temporal CSPs, quantified CSPs
- structures with an oligomorphic automorphism group
- (fractional) polymorphisms

PUBLICATIONS

- [1] M. Bodirsky, É. Bonnet, and **Ž. Semanišínová**, “Temporal valued constraint satisfaction problems”, to appear at MFCS 2025, available at <https://arxiv.org/abs/2409.07285>.
- [2] M. Bodirsky, P. Jonsson, B. Martin, A. Mottet, and **Ž. Semanišínová**, “Complexity classification transfer for CSPs via algebraic products”, *SIAM Journal on Computing*, vol. 53, no. 5, pp. 1293–1353, 2024.
- [3] M. Bodirsky, **Ž. Semanišínová**, and C. Lutz, “The complexity of resilience problems via valued constraint satisfaction problems”, in *Proceedings of the 39th Annual ACM/IEEE Symposium on Logic in Computer Science*, ser. LICS ’24, Tallinn, Estonia: Association for Computing Machinery, 2024.
- [4] J. Rydval, **Ž. Semanišínová**, and M. Wrona, “Identifying Tractable Quantified Temporal Constraints Within Ord-Horn”, in *51st International Colloquium on Automata, Languages, and Programming (ICALP 2024)*, ser. Leibniz International Proceedings in Informatics (LIPIcs), vol. 297, Dagstuhl, Germany: Schloss Dagstuhl – Leibniz-Zentrum für Informatik, 2024, 151:1–151:20.
- [5] **Ž. Semanišínová** and D. Stanovský, “Three concepts of nilpotence in loops”, *Results Math.*, vol. 78, no. 4, Paper No. 119, 15, 2023.
- [6] **Ž. Semanišínová**, “Paramedial quasigroups of prime and prime square order”, *Journal of Algebra and its Applications*, vol. 21, no. 12, 2022.

CONFERENCE AND SEMINAR TALKS

(invited talks in bold)

1. *Temporal Valued Constraint Satisfaction Problems*, AAA107, Bern, Switzerland, June 2025.
2. *Valued Constraint Satisfaction Problem and Resilience in Database Theory*, Dagstuhl seminar: The Constraint Satisfaction Problem: Complexity and Approximability, Schloss Dagstuhl, Germany, May 2025.
3. *Valued Constraint Satisfaction Problem and Resilience in Database Theory*, Dagstuhl seminar: Semirings in Databases, Automata, and Logic, Schloss Dagstuhl, Germany, February 2025.
4. *Valued Constraints over Infinite Domains*, Research Seminar in Discrete Mathematics and Algebra, Freiberg, Germany, February 2025.
5. *Valued Constraints over Infinite Domains*, Algebra seminar, Dresden, Germany, October 2024.
6. *The Complexity of Resilience Problems via Valued Constraint Satisfaction Problems*, LICS'24, Tallinn, Estonia, July 2024
7. *Classification Transfer for CSPs via Algebraic Products*, Women in Logic, Tallinn, Estonia, July 2024
8. ***Identifying Tractable Quantified Temporal Constraints***, Trends in Arithmetic Theories, Tallinn, Estonia, July 2024
9. *Identifying Tractable Quantified Temporal Constraints within Ord-Horn*, AAA105, Prague, Czech Republic, May/June 2024
10. *Constraint satisfaction problems: an algebraic approach to classifying computational complexity*, Algebra seminar at Pavol Jozef Šafárik University, Košice, Slovakia, February 2024
11. ***Valued Constraint Satisfaction Problem and Resilience in Database Theory***, workshop Combinatorial Problems in Model Theory and Computer Science, Leeds, United Kingdom, November 2023
12. ***Valued Constraint Satisfaction Problem and Resilience in Database Theory***, Algebra week, Siena, Italy, July 2023
13. *Valued Constraint Satisfaction Problem and Resilience in Database Theory*, AAA103, Tartu, Estonia, June 2023
14. *Valued Constraint Satisfaction Problem and Resilience in Database Theory*, Spring school of the Department of Algebra, Železnice, Czech Republic, March 2023
15. *Complexity Classification Transfer for CSPs via Algebraic Products*, PALS, online, January 2023
16. *Constraint Satisfaction Problems of First-Order Expansions of Algebraic Products*, CWC 2022, Italy, Molveno, September 2022
17. *Constraint Satisfaction Problems of First-Order Expansions of Algebraic Products*, AAA102, Szeged, Hungary, June 2022
18. *Constraint Satisfaction Problems of First-Order Expansions of Algebraic Products*, Spring school of the Department of Algebra, Lomnice nad Popelkou, Czech Republic, May 2022
19. *Paramedial quasigroups of prime and prime square order*, Fall school of the Department of Algebra, Telecí, Czech Republic, November 2021
20. *Supernilpotent loops*, International Seminar of the Institute of Algebra, Dresden, Germany, October 2021
21. *Paramedial quasigroups of prime and prime square order*, LOOPS 2019, Budapest, Hungary, July 2019

GRANT PARTICIPATION

Complexity of Optimization: Valued CSPs on Infinite Domains

principal investigator

– starting October 2025

– funding amount: 346 505 EUR

TU Wien, Austria

2025–2028

Polynomial-time Computation: Opening the Blackboxes in Constraint Problems

team member

TU Dresden, Germany

2023–2025

Finitely Bounded Homogeneous Structures

team member

TU Dresden, Germany

2021–2023

REFEREEING

- Journal of Artificial Intelligence Research
- conference RAMiCS
- conference LICS ($\times 2$)
- conference CP

TEACHING AND STUDENT SUPERVISION

- **Bachelor thesis co-supervision** (with Manuel Bodirsky): Leon Papan, TU Dresden 2025
- **exercise session**, TU Dresden Winter 2022/2023
Discrete Structures
 - in English
- **exercise sessions**, Charles University Summer 2020, 2021
Number Theory (NMMB206)

SCHOLARSHIPS AND AWARDS

- 2nd place in SVOČ (university students research competition) 2021
- Dean's Teaching Award 2020
- Student Faculty Grant January–May 2020
- merit scholarship 2017, 2018, 2019, 2020
- honourable mention from the International Mathematical Modeling Challenge 2015, 2016
- participation at the national round of the Mathematical Olympiad 2015, 2016

EXPERIENCE

Charles University

investigator

Prague, Czech Republic

2020–2021

– Formalization of Combinatorics on Words (GAČR grant)

– The aim of the project was to formalize basics of the known theory of combinatorics on words in the proof assistant Isabelle. My work mostly consisted of writing and revising lemmas, theorems and proofs in order to make them compact and useful for the rest of the theory.

Pavol Jozef Šafárik University

organizer of educational activities for talented students

Košice, Slovakia

2017–2021

- IT Academy – education for the 21st century (national project from ESIF)
- The aim of the project was innovation of education of elementary and high school students in the field of computer science, information technologies, mathematics and another STEM subjects. My responsibility was organization of mathematical competitions and camps, which improve mathematical skills and knowledge and stimulate students' interest in mathematics.

EXTRACURRICULAR ACTIVITIES

- Volunteer in the Association STROM 2012–2022
 - I organized mathematical competitions such as correspondence seminars or team competitions and mathematical camps for students of elementary and high schools. In 2020-2022, I was the coordinator of the seminar STROM for high school students.
- Regional coordinator in the Slovak Debate Association 2014–2015
 - I was one of the main organizers of regional tournaments in debating for elementary school students, responsible for organizational and professional aspects of the tournaments.

SKILLS

- **Programming languages:** Pascal, C# (basics)
- **Automated theorem proving:** Isabelle/HOL

LANGUAGES

- **English:** fluent
- **German:** intermediate
- **Spanish:** elementary
- **Czech:** fluent
- **Slovak:** native