



Šimon SCHIERREICH

— Curriculum vitæ

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| About Me

I am a postdoctoral fellow at AGH University of Krakow, working with Piotr Faliszewski on the ERC-funded project PRAGMA. I received my PhD from the Czech Technical University in Prague, where I was part of the G²OAT research group supervised by Dušan Knop. My research explores how computational methods can make collective decisions like participatory budgeting, resource allocation, and coalition formation more fair and efficient. I combine theoretical tools from parameterized complexity and algorithmic game theory with experimental evaluation to understand when these problems are tractable in practice and to validate algorithmic solutions and mathematical models underlying these problems on realistic instances.

| Education

- 2020 – 2025 ○ **Doctoral degree in Theoretical Computer Science**, *Czech Technical University in Prague, Faculty of Information Technology*
 - Thesis: Multivariate Complexity and Structural Restrictions in Computational Social Choice
 - Supervisor: doc. RNDr. Dušan Knop, Ph.D.
- 2018 – 2020 ○ **Master's degree in Theoretical Computer Science**, *Czech Technical University in Prague, Faculty of Information Technology*
 - Thesis: Sum Graphs
 - Supervisor: RNDr. Dušan Knop, Ph.D.
- 2014 – 2018 ○ **Bachelor's degree in Theoretical Computer Science**, *Czech Technical University in Prague, Faculty of Information Technology*
 - Thesis: Practical performance of different implementations of the priority queue
 - Supervisor: doc. Ing. Ivan Šimeček, Ph.D.

| Publications

- [31] A. Kaczmarczyk, Š. Schierreich, N. A. Tanujaya, and H. Xu, "Optimal Path Planning in Hostile Environments". In: *Proceedings of the 36th International Conference on Automated Planning and Scheduling, ICAPS '26*. 2026. [to appear]
- [30] A. Deligkas, E. Eiben, T. Goldsmith, D. Knop, and Š. Schierreich, "Stability in Distance Preservation Games on Graphs". In: *Proceedings of the 25th International Conference on Autonomous Agents and Multiagent Systems, AAMAS '26*. 2026. [to appear]
- [29] F. Fioravantes, H. Gahlawat, N. Melissinos, and Š. Schierreich, "Individual Rationality in Constrained Hedonic Games: Additively Separable and Fractional Preferences". In: *Proceedings of the 25th International Conference on Autonomous Agents and Multiagent Systems, AAMAS '26*. 2026. [to appear]
- [28] T. Delemazure, P. Faliszewski, Ł. Janeczko, D. Knop, K. Pekárková, J. Pokorný, Š. Schierreich, and I. Schlotter, "Detecting Approximate Clones under Approval Voting". In: *Proceedings of the 25th International Conference on Autonomous Agents and Multiagent Systems, AAMAS '26*. 2026. [to appear]
- [27] Š. Schierreich and K. Sornat, "Algorithms for Candidate Control in Sequential Participatory Budgeting Rules". In: *Proceedings of the 25th International Conference on Autonomous Agents and Multiagent Systems, AAMAS '26*. 2026. [to appear]
- [26] A. Deligkas, E. Eiben, T. Goldsmith, D. Knop, and Š. Schierreich, "Dividing Indivisible Items for the Benefit of All: It is Hard to Be Fair Without Social Awareness". In: *Proceedings of the 40th AAAI Conference on Artificial Intelligence, AAAI '26*. 2026. [to appear]
- [25] Š. Schierreich, "Multivariate Complexity and Structural Restrictions in Computational Social Choice". *PhD Thesis*, Czech Technical University in Prague. 2025. url:<https://dspace.cvut.cz/entities/publication/5dbe95de-d3c6-44f4-b0d1-4883dfc12777>

- [24] P. Faliszewski, Ł. Janeczko, D. Knop, J. Pokorný, Š. Schierreich, M. Słuszniaak, and K. Sornat, "Participatory Budgeting Project Strength via Candidate Control". In: *Proceedings of the 34th International Joint Conference on Artificial Intelligence, IJCAI '25*. 2025. pp. 3821–3829. doi:10.24963/ijcai.2025/425
- [23] V. Blažej, D. Knop, and Š. Schierreich, "Controlling the Spread of Two Secrets in Diverse Social Networks". In: *Proceedings of the 22nd European Conference on Multi-Agent Systems, EUMAS '25*. 2025. Volume 16258 of *Lecture Notes in Computer Science*, [to appear]
- [22] G. Lisowski and Š. Schierreich, "Stability in Newcomers' Housing: A Story About Anonymous Preferences and Beyond". In: *Proceedings of the 22nd European Conference on Multi-Agent Systems, EUMAS '25*. 2025. Volume 16258 of *Lecture Notes in Computer Science*, [to appear]
- [21] P. Faliszewski, Ł. Janeczko, D. Knop, J. Pokorný, Š. Schierreich, M. Słuszniaak, and K. Sornat, "Participatory Budgeting Project Strength via Candidate Control". In: *Proceedings of the 24th International Conference on Autonomous Agents and Multiagent Systems, AAMAS '25*. 2025. pp. 2514–2516. url:https://dl.acm.org/doi/10.5555/3709347.3743921
- [20] A. Deligkas, E. Eiben, S. D. Ioannidis, D. Knop, and Š. Schierreich, "Balanced and Fair Partitioning of Friends". In: *Proceedings of the 39th AAAI Conference on Artificial Intelligence, AAAI '25*. 2025. pp. 13754–13762. doi:10.1609/aaai.v39i13.33503
- [19] Š. Schierreich, "Two-Stage Refugee Resettlement Models: Computational Aspects of the Second Stage". In: *Proceedings of the 7th AAAI/ACM Conference on AI, Ethics, and Society, AIES '24*. 2024. pp. 50–51. doi:10.1609/aies.v7i2.31908
- [18] M. Dvořák, D. Knop, and Š. Schierreich, "On the Complexity of Target Set Selection in Simple Geometric Networks". *Discrete Mathematics & Theoretical Computer Science*. 2024. **26**(2), doi:10.46298/dmtcs.11591
- [17] V. Blažej, D. Knop, J. Pokorný, and Š. Schierreich, "Equitable Connected Partition and Structural Parameters Revisited: N-Fold Beats Lenstra". In: *Proceedings of the 49th International Symposium on Mathematical Foundations of Computer Science, MFCS '24*. 2024. Volume 306 of *Leibniz International Proceedings in Informatics*, pp. 29:1–29:16. doi:10.4230/LIPIcs.MFCS.2024.29
- [16] Š. Schierreich, "Multivariate Analysis and Structural Restrictions in Computational Social Choice". In: *Proceedings of the 33rd International Joint Conference on Artificial Intelligence, IJCAI '24*. 2024. pp. 8502–8503. doi:10.24963/ijcai.2024/966
- [15] A. Deligkas, E. Eiben, D. Knop, and Š. Schierreich, "Individual Rationality in Topological Distance Games Is Surprisingly Hard". In: *Proceedings of the 33rd International Joint Conference on Artificial Intelligence, IJCAI '24*. 2024. pp. 2782–2790. doi:10.24963/ijcai.2024/308
- [14] N. Boehmer, P. Faliszewski, Ł. Janeczko, D. Peters, G. Pierczynski, Š. Schierreich, P. Skowron, and S. Szufa, "Evaluation of Project Performance in Participatory Budgeting". In: *Proceedings of the 33rd International Joint Conference on Artificial Intelligence, IJCAI '24*. 2024. pp. 2678–2686. doi:10.24963/ijcai.2024/296
- [13] Š. Schierreich and J. G. Smutný, "The Parameterized Complexity of Maximum Betweenness Centrality". In: *Proceedings of the 18th Annual Conference on Theory and Applications of Models of Computation, TAMC '24*. 2024. Volume 14637 of *Lecture Notes in Computer Science*, pp. 221–233. doi:10.1007/978-981-97-2340-9_19
- [12] A. Deligkas, E. Eiben, V. Korchemna, and Š. Schierreich, "The Complexity of Fair Division of Indivisible Items with Externalities". In: *Proceedings of the 38th AAAI Conference on Artificial Intelligence, AAAI '24*. 2024. pp. 9653–9661. doi:10.1609/aaai.v38i9.28822
- [11] R. Ganian, T. Hamm, D. Knop, Š. Schierreich, and O. Suchý, "Hedonic Diversity Games: A Complexity Picture with More Than Two Colors". *Artificial Intelligence*. 2023. **325**, pp. 104017. doi:10.1016/j.artint.2023.104017
- [10] R. Ganian, T. Hamm, D. Knop, S. Roy, Š. Schierreich, and O. Suchý, "Maximizing Social Welfare in Score-Based Social Distance Games". In: *Proceedings of the 19th Conference on Theoretical Aspects of Rationality and Knowledge, TARK '23*. 2023. Volume 379 of *Electronic Proceedings in Theoretical Computer Science*, pp. 272–286. doi:10.4204/EPTCS.379.22
- [9] M. Dvořák, D. Knop, and Š. Schierreich, "Establishing Herd Immunity is Hard Even in Simple Geometric Networks". In: *Proceedings of the 18th International Workshop on Algorithms and Models for the Web Graph, WAW '23*. 2023. Volume 13894 of *Lecture Notes in Computer Science*, pp. 68–82. doi:10.1007/978-3-031-32296-9_5

- [8] D. Knop and Š. Schierreich, "Host Community Respecting Refugee Housing". In: *Proceedings of the 22nd International Conference on Autonomous Agents and Multiagent Systems, AAMAS '23*. 2023. pp. 966–975. url:<https://dl.acm.org/doi/10.5555/3545946.3598736>
- [7] V. Blažej, R. Ganian, D. Knop, J. Pokorný, Š. Schierreich, and K. Simonov, "The Parameterized Complexity of Network Microaggregation". In: *Proceedings of the 37th AAAI Conference on Artificial Intelligence, AAAI '23*. 2023. pp. 6262–6270. doi:10.1609/aaai.v37i5.25771
- [6] Š. Schierreich, "Maximizing Influence Spread through a Dynamic Social Network (Student Abstract)". In: *Proceedings of the 37th AAAI Conference on Artificial Intelligence, AAAI '23*. 2023. pp. 16316–16317. doi:10.1609/aaai.v37i13.27018
- [5] V. Blažej, P. Choudhary, D. Knop, Š. Schierreich, O. Suchý, and T. Valla, "On Polynomial Kernels for Traveling Salesperson Problem and Its Generalizations". In: *Proceedings of the 30th Annual European Symposium on Algorithms, ESA '22*. 2022. Volume 244 of *Leibniz International Proceedings in Informatics*, pp. 22:1–22:16. doi:10.4230/LIPIcs.ESA.2022.22
- [4] R. Ganian, T. Hamm, D. Knop, Š. Schierreich, and O. Suchý, "Hedonic Diversity Games: A Complexity Picture with More than Two Colors". In: *Proceedings of the 36th AAAI Conference on Artificial Intelligence, AAAI '22*. 2022. pp. 5034–5042. doi:10.1609/aaai.v36i5.20435
- [3] D. Knop, Š. Schierreich, and O. Suchý, "Balancing the Spread of Two Opinions in Sparse Social Networks (Student Abstract)". In: *Proceedings of the 36th AAAI Conference on Artificial Intelligence, AAAI '22*. 2022. pp. 12987–12988. doi:10.1609/aaai.v36i11.21630
- [2] V. Blažej, D. Knop, and Š. Schierreich, "Controlling the Spread of Two Secrets in Diverse Social Networks (Student Abstract)". In: *Proceedings of the 36th AAAI Conference on Artificial Intelligence, AAAI '22*. 2022. pp. 12919–12920. doi:10.1609/aaai.v36i11.21596
- [1] Š. Schierreich and O. Suchý, "Waypoint Routing on Bounded Treewidth Graphs". *Information Processing Letters*. 2022. **173**, pp. 106165. doi:10.1016/j.ipl.2021.106165

Working Papers

- F. Connor, M. Dupré la Tour, V. V. Narayan, and Š. Schierreich, "Tight Asymptotic Bounds for Fair Division With Externalities". arXiv: 2601.13287
- H. Aziz, A. Deligkas, E. Eiben, V. Korchemna, Š. Schierreich, W. Suksompong, Z. Sun, and T. Walsh, "Fair Allocation of Indivisible Items with Externalities".
- H. Hosseini and Š. Schierreich, "Delivering Fairly in the Gig Economy". arXiv: 2503.16002
- Š. Schierreich, "Towards More Realistic Models for Refugee Integration: Anonymous Refugee Housing with Upper-Bounds". arXiv: 2308.09501
- Š. Schierreich, "Elections in the Post-Quantum Era: Is the Complexity Shield Strong Enough?". arXiv: 2403.05273

Projects and Grants

- 2024 – 2025 ○ **Fulbright Fellowship**
 - Fellowship at Pennsylvania State University, USA, hosted by Hadi Hosseini
 - Fulbright-Masaryk Fellow
- 2023 ○ **CEEPUS Mobility Grant**
 - Freemover Scholarship to AGH University, Kraków, hosted by Piotr Faliszewski
 - Visiting Researcher
- 2019 – 2020 ○ **Walking Through Waypoints**
 - Student Summer Research Programme 2019 of FIT CTU in Prague
 - Principal Investigator

Talks and Presentations

Balancing the Spread of Two Opinions in Sparse Social Networks

- 6th School on Theoretical Informatics, Graphs, and Mathematical Applications, STIGMA '21
- 2022 DIMEA Days (*poster*)

Controlling the Spread of Two Secrets in Diverse Social Networks

- 22nd European Conference on Multi-Agent Systems, EUMAS '25

Delivering Fairly in the Gig Economy

- 3rd Amsterdam/Saint-Etienne Workshop on Social Choice (*poster*)
- 3rd IJCAI Workshop on Computational Fair Division, CFD@IJCAI '25 (*poster, oral*)
- 10th Workshop on Computational Social Choice, COMSOC '25 (*poster*)
- 16th Multidisciplinary Workshop on Advances in Preference Handling, MPREF '25

Dividing Indivisible Items for the Benefit of All: It is Hard to Be Fair Without Social Awareness

- 40th AAAI Conference on Artificial Intelligence, AAAI '26 (*poster, oral*)
- 16th Day on Computational Game Theory, CGT '26

Enhancing Refugee Resettlement Outcomes Through Algorithmic Solutions

- Young Achievers Symposium, Center for Socially Responsible Artificial Intelligence (*invited*)

Equitable Connected Partition and Structural Parameters Revisited: N-fold Beats Lenstra

- 60th Czech-Slovak Conference on Graph Theory, CSGT '25
- 12th Conference on Contemporary Trends in Theoretical Computer Science, STTI '25 (*invited*)

Hedonic Diversity Games: A Complexity Picture with More than Two Colors

- 2023 Warsaw Workshop of Social Choice

Host Community Respecting Refugee Housing

- 22nd International Conference on Autonomous Agents and Multiagent Systems, AAMAS '23 (*poster, oral*)
- 9th International Workshop on Computational Social Choice, COMSOC '23
- PRAGMA research group seminar
- 1st Amsterdam/Saint-Etienne Workshop on Social Choice (*poster*)
- Winter School on Algorithms for Graphs and Games 2022 (*poster*)

Individual Rationality in Constrained Hedonic Games: Anonymous and Diversity Preferences

- PRAGMA seminar
- University of Augsburg TCS Seminar

Individual Rationality in Topological Distance Games is Surprisingly Hard

- 33rd International Joint Conference on Artificial Intelligence, IJCAI '24 (*poster, oral*)

Maximizing Influence Spread through a Dynamic Social Network

- 37th AAAI Conference on Artificial Intelligence, AAAI '23 (*poster, oral*)
- PhD Day of the 7th International Conference on Algorithmic Decision Theory, ADT '21

Maximizing Social Welfare in Score-Based Social Distance Games

- 19th Conference on Theoretical Aspects of Rationality and Knowledge, TARK '23 (*poster, oral*)

Multivariate Analysis and Structural Restrictions in Computational Social Choice

- 33rd International Joint Conference on Artificial Intelligence, IJCAI '24 (*poster, oral*)

Participatory Budgeting Project Strength via Candidate Control

- FAIR Lab seminar
- 34th International Joint Conference on Artificial Intelligence, IJCAI '25 (*poster*)
- HHU Düsseldorf CCC Group Seminar

Stability in Newcomers' Housing: A Story About Anonymous Preferences and Beyond

- 10th European Starting AI Researchers' Symposium, STAIRS '23 (*poster*)
- 9th International Workshop on Computational Social Choice, COMSOC '23 (*poster*)
- 22nd European Conference on Multi-Agent Systems, EUMAS '25

Sum Graphs

- 5th School on Theoretical Informatics, Graphs, and Mathematical Applications, STIGMA '20

The Complexity of Fair Division of Indivisible Items with Externalities

- 2nd IJCAI Workshop on Computational Fair Division, CFD@IJCAI '24 (*invited*)
- 8th School on Theoretical Informatics, Graphs, and Mathematical Applications, STIGMA '23

- 38th AAAI Conference on Artificial Intelligence, AAAI '24 (*poster*)
- 2nd Amsterdam/Saint-Etienne Workshop on Social Choice (*poster*)
- Warsaw–Krakow Seminar on Economics and AI

The Parameterized Complexity of Maximum Betweenness Centrality

- 18th Annual Conference on Theory and Applications of Models of Computation, TAMC '24

The Parameterized Complexity of Network Microaggregation

- 11th Conference on Contemporary Trends in Theoretical Computer Science, STTI '23 (*invited*)
- 37th AAAI Conference on Artificial Intelligence, AAAI '23 (*poster, oral*)

Two-Stage Refugee Resettlement Models: Computational Aspects of the Second Stage

- 7th AAAI/ACM Conference on AI, Ethics, and Society, AIES '24 (*poster*)

Waypoint Routing on Bounded Treewidth Graphs

- 11th International Colloquium on Graph Theory and Combinatorics, ICGT '22
- G²OAT research group seminar

Awards

- 2025 **Josef Hlávka Award**
Czech award for Outstanding Young Researchers under 33, Granted by the Josef, Marie, and Zdeňka Hlávka Foundation.
- 2025 **Stanislav Hanzl Stipend**
Travel Stipend Awarded to Outstanding Students of CTU in Prague
- 2022 **Stanislav Hanzl Award**
Outstanding Student of the CTU in Prague
- 2022 **Student Scientific and Professional Activities Competition**
Third place in Theoretical Computer Science, joint work with M. Dvořák

Professional Activities

- Organizing Committee Memberships CFD@IJCAI '26, CFD@IJCAI '25, EASSS '23, STIGMA '23, STIGMA '22.
- Program Committee Memberships EC '26, IJCAI '26, ICAPS '26, AAMAS '26, AAAI '26, WINE '25, GAIW '25, AAMAS '25, AAAI '25, GAIW '24, IJCAI '24, AAAI '24, ECAI '23, AAMAS '23.
- Journal Reviews Annals of Mathematics and Artificial Intelligence, Autonomous Agents and Multi-Agent Systems, Artificial Intelligence, Discrete Applied Mathematics, Information Processing Letters, Journal of Artificial Intelligence Research, Journal of Computer and System Sciences, Software: Practice and Experience, Theoretical Computer Science.
- Conference Reviews WG '26, SOFSEM '26, FSTTCS '25, SAGT '24, ECAI '24, ESA '24, ICALP '24, WADS '23, CPM '23, AAMAS '23, MFCS '22, AAMAS '22, IWOCA '22, WG '21, MFCS '21.

Supervised Students

- 2024 **Vojtěch Kopal**, *Bachelor*
“Structural Properties of Sidewalk Networks”
- 2024 **Václav Turek**, *Bachelor*
“Structural Properties of Infrastructure Networks”
- 2023 **Patrik Drbal**, *Bachelor*
“Hiding Leaders in Covert Networks”
- 2023 **Matyáš Turek**, *Bachelor*
“Analysis of Group Centrality Measures in Real-World Social Networks”
- 2023 **José Gaspar Smutný**, *Bachelor*
“Computational Complexity of Maximum Betweenness Centrality”
- 2023 **Petr Michalíček**, *Master*
“How Hard is to Catch a CuBird?”

- 2023 ○ **Ondřej Nohava**, *Bachelor*
"Schelling Games: When Stubborn Agents Matter"
- 2023 ○ **Dominik Šmejkal**, *Master*
"Temporal Stable Matchings"
- 2021 ○ **Jan Růžička**, *Maturita*
"Opetoric Complexes in Category Theory"

| Teaching Experience

- 2025 ○ **Operations Research and Linear Programming**
tutor
- 2024 ○ **DS 305: Algorithmic Methods**
guest lecturer
- 2024, 2025 ○ **Theory of Voting Systems**
tutor, master's course
- 2022 ○ **Sublinear Algorithms**
tutor, master's course
- 2022 ○ **Algorithmic Game Theory**
tutor, master's course
- 2022 – 2025 ○ **Selected Combinatorics Applications**
lecturer
- 2021 ○ **Automata and Grammars**
tutor
- 2021, 2025 ○ **Algorithms and Graphs 2**
tutor
- 2020, 2021 ○ **Algorithms and Graphs 1**
tutor
- 2020, 2021 ○ **Database Systems**
tutor
- 2020, 2021 ○ **Programming and Algorithms 2**
tutor
- 2019 – 2021 ○ **Programming and Algorithms 1**
tutor
- 2019 – 2024 ○ **Seminar in Informatics**
lecturer, high school course

| Work Experience

- 2016 – 2019 ○ **MESSENGER a.s.**
Team Leader, Software Developer, Java/JavaScript programming, infrastructure management
- 2014 – 2016 ○ **Freelance Web Developer**
Web Applications, PHP, full-stack