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## Research Interests

Extremal, Probabilistic, and Algorithmic Combinatorics (Fixed-Parameter Tractability, Limits, Quasirandomness), Structural Graph Theory (Hadwiger's Conjecture, Rooted Minors, Colourings).

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## Academic Qualifications

- since 2020 **Postdoc in Informatics**, *Masaryk University Brno, Faculty of Informatics*.  
supervised by prof. Daniel Král.
- 2017–2020 **Doctor rerum naturalium in Mathematics**, *Ilmenau University of Technology*.  
PhD-Thesis: “Rooted Structures in Graphs : A Project on Hadwiger's Conjecture, Rooted Minors, and Tutte Cycles”,  
project funded by the German Research Foundation (DFG),  
supervised by Univ.-Prof. Dr. rer. nat. habil. Matthias Kriesell,  
GPA: magna cum laude
- 2014–2016 **Master of Science in Mathematics**, *Ilmenau University of Technology*.  
Thesis: “On Lower Bounds on the Independence Number of Graphs”,  
supervised by Univ.-Prof. Dr. rer. nat. habil. Dr. h. c. Jochen Harant,  
GPA: 1,0<sup>1</sup>.
- 2011–2014 **Bachelor of Science in Mathematics**, *Ilmenau University of Technology*.  
Thesis: “Quadratic Forms on Graphs and Maximum Weighted Induced Subgraphs”,  
supervised by Univ.-Prof. Dr. rer. nat. habil. Dr. h. c. Jochen Harant,  
GPA: 1,0<sup>1</sup>.
- 2003–2011 **High School Diploma (Abitur)**, *Erasmus-Grasser-Gymnasium*, Munich, Germany.  
GPA: 1,2<sup>1</sup>

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## Journal Publications

- [13] Jacob W Cooper, Daniel Král, Ander Lamaison, and Samuel Mohr: **Quasirandom Latin squares**  
submitted. arXiv: 2011.07572.
- [12] Jochen Harant and Samuel Mohr: **New bounds on domination and independence in graphs**  
submitted. arXiv: 2008.12601.
- [11] Max Hahn-Klimroth, Giulia S. Maesaka, Yannick Mogge, Samuel Mohr, and Olaf Parczyk: **Random perturbation of sparse graphs**  
submitted. arXiv: 2004.04672.
- [10] Thomas Böhme, Jochen Harant, Matthias Kriesell, Samuel Mohr, and Jens M Schmidt: **Rooted Minors and Locally Spanning Subgraphs**  
submitted. arXiv: 2003.04011.
- [9] Igor Fabrici, Jochen Harant, Samuel Mohr, and Jens M Schmidt: **Circumference of essentially 4-connected planar triangulations**  
accepted.
- [8] Matthias Kriesell and Samuel Mohr: **Kempe chains and rooted minors**  
submitted. arXiv: 1911.09998.
- [7] Samuel Mohr: **A construction of uniquely colourable graphs**  
*Discrete Applied Mathematics* (2021). to appear. DOI: 10.1016/j.dam.2020.11.015. arXiv: 2001.08801.
- [6] Igor Fabrici, Jochen Harant, Tomáš Madaras, Samuel Mohr, Roman Soták, and Carol T Zamfirescu: **Long cycles and spanning subgraphs of locally maximal 1-planar graphs**  
*Journal of Graph Theory* 95.1 (2020), pp. 125–137. DOI: 10.1002/jgt.22542. arXiv: 1912.08028.

<sup>1</sup> Grades in Germany: 1 = A, 2 = B, ..., 6 = F.

- [5] Igor Fabrici, Jochen Harant, Samuel Mohr, and Jens M Schmidt: **On the circumference of essentially 4-connected planar graphs**  
*Journal of Graph Algorithms and Applications* 24.1 (2020), pp. 21–46. DOI: 10.7155/jgaa.00516. arXiv: 1806.09413.
- [4] Igor Fabrici, Jochen Harant, Samuel Mohr, and Jens M Schmidt: **Longer cycles in essentially 4-connected planar graphs**  
*Discussiones Mathematicae Graph Theory* 40.1 (2020), pp. 269–277. DOI: 10.7151/dmgt.2133. arXiv: 1710.05619.
- [3] Matthias Kriesell and Samuel Mohr: **Rooted complete minors in line graphs with a Kempe coloring**  
*Graphs and Combinatorics* 35.2 (2019), pp. 551–557. DOI: 10.1007/s00373-019-02012-7. arXiv: 1804.06641.
- [2] Jochen Harant and Samuel Mohr: **On Selkow’s bound on the independence number of graphs**  
*Discussiones Mathematicae Graph Theory* 39.3 (2019), pp. 655–657. DOI: 10.7151/dmgt.2100. arXiv: 1705.03779.
- [1] Jochen Harant and Samuel Mohr: **Maximum weighted induced subgraphs**  
*Discrete Mathematics* 339.7 (2016), pp. 1954–1959. DOI: 10.1016/j.disc.2015.07.013.

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## Refereed Conference Proceedings

- [3] Samuel Mohr: **On the circumference of 3-connected maximal 1-planar graphs**  
(2019). Bordeaux Graph Workshop 2019, pp. 222–223. URL: <http://bgw.labri.fr/2019/booklet.pdf>.
- [2] Samuel Mohr: **Cycles through a set of specified vertices of a planar graph**  
*Acta Mathematica Universitatis Comenianae* 88.3 (2019). Eurocomb 2019, pp. 963–966. URL: <http://www.iam.fmph.uniba.sk/amuc/ojs/index.php/amuc/article/view/1286>.
- [1] Samuel Mohr: **On uniquely colourable graphs**  
(2019). Cologne-Twente Workshop 2019, pp. 103–105. URL: <http://wwhome.math.utwente.nl/~ctw/CTW2019ProceedingsFinal.pdf>.

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## Minor Research Contributions

- [1] Henk de Snoo and Harald Woracek: **Compressed resolvents,  $Q$ -functions and  $h_0$ -resolvents in almost pontryagin spaces**  
*Indefinite Inner Product Spaces, Schur Analysis, and Differential Equations*. Springer, 2018, pp. 425–484. DOI: 10.1007/978-3-319-68849-7\_18.

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## Conferences

- 12/2020 **Bringing Young Mathematicians Together (BYMAT)**, Valencia, resp. online.  
Talk: “Rooted Structures in Graphs”
- 08/2020 **Czech-Slovak Conference Graphs**, Brno, Czech Republic.  
Talk: “Rooted Structures in Graphs”
- 12/2019 **Operator Theory and Krein Spaces**, Vienna, Austria.  
Talk: “Eigenvalues of Graphs”
- 11/2019 **Colloquium on Combinatorics**, Paderborn, Germany.  
Talk: “X-minors and X-spanning subgraphs”
- 10/2019 **Bordeaux Graph Workshop**, Bordeaux, France.  
Extended abstract and talk: “On the Circumference of 3-Connected Maximal 1-Planar Graphs”
- 09/2019 **Cycles & Colourings**, Nový Smokovec, High Tatras, Slovakia.  
Talk: “On Uniquely Colourable Graphs”
- 08/2019 **European conference on combinatorics, graph theory and applications**, Bratislava, Slovakia.  
Extended abstract and talk: “Cycles through a set of specified vertices of a planar graph”
- 08/2019 **Ghent Graph Theory Workshop on Structure and Algorithms**, Ghent, Belgium.  
Invited contributed talk: “X-minors and X-spanning subgraphs”
- 07/2019 **Cologne-Twente Workshop on Graphs & Combinatorial Optimization**, Enschede, Netherlands.  
Extended abstract and talk: “On Uniquely Colourable Graphs”

- 06/2019 **Czech-Slovak Conference Graphs**, *Čingov, Slovak Paradise*, Slovakia.  
Talk: “Hamiltonicity of 1-planar graphs”
- 05/2019 **Canadian Discrete and Algorithmic Mathematics Conference**, *Vancouver*, Canada.  
Talk: “Kempe Chains and Rooted Minors”
- 11/2018 **Colloquium on Combinatorics**, *Paderborn*, Germany.  
Talk: “Kempe Chains and Rooted Minors”
- 07/2018 **Building Bridges II**, *Budapest*, Hungary.  
Poster: “On Selkow’s Bound on the Independence Number of Graphs”
- 07/2018 **International Colloquium on Graph Theory and Combinatorics**, *Lyon*, France.
- 09/2018 **Cycles & Colourings**, *Nový Smokovec, High Tatras*, Slovakia.  
Talk: “Kempe Chains and Rooted Minors”
- 11/2017 **Colloquium on Combinatorics**, *Paderborn*, Germany.  
Talk: “On Selkow’s Bound on the Independence Number of Graphs”
- 09/2017 **Cycles & Colourings**, *Nový Smokovec, High Tatras*, Slovakia.  
Talk: “Longer Cycles In Essentially 4-Connected Planar Graphs”
- 09/2014 **Cycles & Colourings**, *Nový Smokovec, High Tatras*, Slovakia.  
Talk: “Quadratic Forms on Graphs and Maximum Weighted Subgraphs”

## Awards and Grants

- 2020+? **DAAD Forschungsstipendien für promovierte Nachwuchswissenschaftler**.  
Grant for a three months research stay at the University of Colorado Denver, USA.  
I haven’t started the research project yet due to the pandemic situation and closed US universities.
- 2017–2020 **German Research Foundation Project**, (Project Number 327533333).  
Grant for Ph.D. studies from April 2017 until May 2020,  
supervised by Prof. Matthias Kriesell.  
Research: Hadwiger’s Conjecture, rooted minors, proper colorings, uniquely colorable graphs.
- 2017–2020 **Two Programs for Project Related Personal Exchange from the German Academic Exchange Service (DAAD)**.  
Exchange with Pavol Jozef Šafárik University in Košice, Slovakia,  
workshops in Heyda and Dörnfeld, Germany; and Košice, Slovakia.  
Research: Long cycles, Hamiltonicity, 1-planar graphs, essentially 4-connected planar graphs.
- 2019 **Travel Scholarship from the German Academic Exchange Service (DAAD)**.  
Funding for conference attendance in Vancouver, Canada.
- 2015–2016 **Erasmus Exchange, Research Project**, invited by Prof. Harald Woracek.  
Research: operator theory, indefinite inner product, Krein spaces, symmetric operators, selfadjoint extension.
- 2015 **Honoring of the Bachelor’s Degree**.  
Conferred by “Society of Friends and Supporters of Mathematics at the Ilmenau University of Technology”.
- 2013, 2015 **“Deutschlandstipendium” supported by Deutsche Kreditbank AG**.  
Student fellowship program from Oct 2013 until Sep 2014 and from Oct 2015 until Sep 2016.
- 2008 **Invitation to Pupils Mathematics Camp**, *Mathematical Kangaroo*, Zakopane, Poland.  
First place achieved at the competition; invitation to a math camp.

## Stays abroad and Invitations

- 2020 **Brno, Czech Republic**, (ten days).  
Courses within the Algorithms and Mathematics Network about extremal graph theory and regularity method,  
Masaryk University in Brno, lecturers: Andrzej Grzesik (JU Kraków), Dan Král (MU Brno).
- 2020 **Lübeck, Germany**, (one week).  
Participation at the Baltic Sea Workshop organized by Hamburg University of Technology,  
invited by Prof. Anusch Taraz.
- 2019 **Hamburg, Germany**, (three days).  
Talk: “Kempe Chains and Rooted Minors”,  
invited by Prof. Anusch Taraz, Hamburg University of Technology.
- 2018 **Košice, Slovakia**, (one week).  
Talk: “Longest Cycles In Essentially 4-Connected Planar Graphs”,  
invited by Prof. RNDr. Tomáš Madaras, Univerzita Pavla Jozefa Šafárika v Košiciach.

2017 **Košice, Slovakia**, (two weeks).

Talk: “Bounds on the Independence Number of Graphs”,  
invited by Prof. RNDr. Tomáš Madaras, Univerzita Pavla Jozefa Šafárika v Košiciach.

2015–2016 **Vienna, Austria**, (six months).

Project: “Operator theory in indefinite inner product spaces”,  
supervised by ao. Univ.-Prof. Dr. Harald Woracek, Vienna University of Technology,  
<http://www.asc.tuwien.ac.at/preprint/2016/asc24x2016.pdf>

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## Organized Conferences and Seminars

07/2020 **Workshop on Graph Theory & Combinatorics in Thuringia, Ilmenau (online)**, Germany.  
Local organizer for IT related issues.

fall 2020 **ITI Online Seminar**, *online*, Czech Republic.  
Co-organized with prof. Tomáš Kaiser.

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## Academic Positions

2018–2019 **Teaching assistant**, for mathematics in the Department of Engineering.

2014–2015 **Teaching assistant**, for mathematics in the Department of Information Technology.

2014–2015 **Student assistant in data analysis**, Institute of Electrical Equipment and Facilities, Ilmenau University of Technology.

Project: “Protection Concepts for Photovoltaic Systems”, supervised by Dr. Felix Erhard.

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## Social Commitment

2020 **Supporting the “26th annual Days of Mathematics and Science Teaching”**, March 2020, Ilmenau.

Talk at the teacher training course about non-geometric applications of the analytic geometry.

2019 **Supporting the “Long Night of Technology”**, May 2019, Ilmenau.

Planning and implementation of an “Escape Room”, design of physical experiments and mathematical puzzles.

2013–2018 **Supporting the Mathematical Olympiad in Thuringia**.

Several talks to pupils of grade 10 to 12 (age of 16 to 18) within the annual mathematical camp in Ilmenau, correction and assessment of the round “Landesrunde”.

2014–2016 **Organization of the student representatives conference “Konferenz der deutschsprachigen Mathematikfachschaften”**, Nov. 2016, Ilmenau.

Catering, housing, program, sponsoring for 60 students.

2013–2019 **Organization of Ultimate Frisbee tournaments**, twice a year, Ilmenau.

About 120 players: catering, schedule, evening activities, hosting.

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## Hobbies

Sports Ultimate Frisbee, cycling, marathon.

Social activities Travelling, cooking.