

Christian Schulz

(630) 235-7457
cschulz3@illinois.edu

917 Macomber Drive
Urbana, IL 61801

Education

- PhD:** Mathematics, University of Illinois at Urbana-Champaign, May 2023 (expected)
Dissertation: “Definability and decidability for expansions of Presburger arithmetic by sets definable from positional numeration systems”
Committee: Lou van den Dries, Philipp Hieronymi, Jeffrey Shallit, Carl Jokusch
- BS:** Computer Science and Mathematics, Rose-Hulman Institute of Technology, May 2017
Summa Cum Laude

Honors and Awards

GAANN Fellowship, 2017 and 2018

Awarded by the U.S. Department of Education to several candidates chosen by the Department of Mathematics at UIUC as excellent students who have a need for financial assistance

Heminway Gold Medal, 2017

Awarded by the faculty at Rose-Hulman Institute of Technology to the graduating senior with the highest grade point average

Clarence P. Sousley Award, 2017

Awarded by the mathematics department at Rose-Hulman Institute of Technology to the graduating senior who most demonstrates exceptional work in mathematics

Research

University of Illinois at Urbana-Champaign, Summer 2018 – present

Advisor: Philipp Hieronymi

- Work on my doctoral research in definability and decidability for expansions of Presburger arithmetic

University of West Georgia REU, Summer 2016

Advisor: Bruce Landman and Abdollah Khodkar

- NSF-funded REU on combinatorics, number theory, and graph theory
- One resulting publication; see below

Mentoring and Teaching

University of Illinois at Urbana-Champaign, Fall 2019 – Spring 2021

Team Leader, Illinois Geometry Lab

- Fall 2019: “Automatic theorem proving”

- Spring 2020: “Building a theorem prover”
- Fall 2020: “Pecan – an automated theorem prover”
- Spring 2021: “Developing Pecan”

University of Illinois at Urbana-Champaign, Fall 2019 – present
Teaching Assistant, Department of Mathematics

- Fall 2019: Math 241, Calculus III (honors section)
- Spring 2020: Math 241, Calculus III
- Fall 2020: Math 241, Calculus III (Head TA assignment)
- Spring 2021: Math 415, Applied Linear Algebra
- Fall 2021: Math 257, Linear Algebra with Computational Applications
- Fall 2022: Math 231E, Calculus II for Engineers

Papers

“Existence of some signed magic arrays” (with A. Khodkar and N. Wagner), *Discrete Math.* 340 (2017), 906-926.

“Decidability for Sturmian words” (with P. Hieronymi, D. Ma, R. Oei, L. Schaeffer, and J. Shallit), *Leibniz International Proceedings in Informatics* 216 (2022), 24:1-24:23.

“A strong version of Cobham’s theorem” (with P. Hieronymi), *STOC 2022: Proceedings of the 54th Annual ACM SIGACT Symposium on Theory of Computing* (2022), 1172-1179.

“Pecan: an automated theorem prover for automatic sequences using Büchi automata” (with R. Oei, D. Ma, and P. Hieronymi), preprint (arXiv:2102.01727).

“Fractal dimensions of k -automatic sets” (with A. Block Gorman), preprint (arXiv:2205.02915).

“Undefinability of multiplication in Presburger arithmetic with sets of powers,” preprint (arXiv:2209.11858).

Talks (selected)

“Existence of some signed magic arrays” (with A. Khodkar and N. Wagner), Midwestern Conference on Combinatorics and Combinatorial Computing, 15 October 2016.

“Undefinability of multiplication in Presburger arithmetic with sets of powers” (with P. Hieronymi), OSU Logic Seminar, 9 November 2021.

“Decidability for Sturmian words” (with P. Hieronymi, D. Ma, R. Oei, L. Schaeffer, and J. Shallit), Computer Science Logic, 16 February 2022.

“A strong version of Cobham’s theorem” (with P. Hieronymi), University of Waterloo Algebra Seminar, 6 April 2022.

“A strong version of Cobham’s theorem” (with P. Hieronymi), ACM Symposium on Theory of Computing, 23 June 2022.