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# Taylor J. Smith

## Contact Information

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		<i>Citizenship:</i>	Canadian

## Research Interests

Primary interests in formal languages/automata theory (particularly in two dimensions), combinatorics on words (particularly in two dimensions), computability/complexity theory; secondary interests in analysis of algorithms, coding theory.

## Education

2017–2021	Doctor of Philosophy, Queen’s University Supervisor: Kai Salomaa
2015–2017	Master of Mathematics, University of Waterloo Supervisor: Jeffrey Shallit
2011–2015	Bachelor of Science (Honours), University of Western Ontario Supervisor: Helmut Jürgensen

## Employment

2021–present	Assistant Professor, Department of Computer Science, St. Francis Xavier University
2017–2021	School of Computing, Queen’s University
2017–2021	Graduate Research Student
Jan. – Apr. 2019	Teaching Fellow
2015–2017	Cheriton School of Computer Science, University of Waterloo
May–Aug. 2017	Sessional Instructor
2015–2017	Graduate Research Student
2014–2015	Research Assistant, Department of Computer Science, University of Western Ontario

## Funding

2021–2024	Dr. H. Stanley and Doreen Alley Heaps Chair Endowment (C\$27 000 total) Faculty of Science, St. Francis Xavier University
2017–2021	Ontario Graduate Scholarship (C\$60 000 total) Government of Ontario
2017–2021	Queen’s Graduate Scholarship (C\$12 000 total) School of Graduate Studies, Queen’s University
2015–2017	Graduate Student Award (C\$5 000 total) Faculty of Mathematics, University of Waterloo

## Publications

*Publications in theoretical computer science customarily list authors alphabetically.*

### Peer-reviewed Journal Articles

- [J3] Taylor J. Smith and Kai Salomaa. [Decision problems and projection languages for restricted variants of two-dimensional automata](#). *Theoretical Computer Science*, 870:153–164, May 2021. Invited extended version of CIAA 2019 article.
- [J2] Da-Jung Cho, Yo-Sub Han, Kai Salomaa, and Taylor J. Smith. [Site-directed insertion: Language equations and decision problems](#). *Theoretical Computer Science*, 798:40–51, Dec. 2019. Invited extended version of DCFS 2018 article.
- [J1] Guilhem Gamard, Gwenaël Richomme, Jeffrey Shallit, and Taylor J. Smith. [Periodicity in rectangular arrays](#). *Information Processing Letters*, 118:58–63, Feb. 2017.

### Peer-reviewed Conference Articles

- [C5] Taylor J. Smith and Kai Salomaa. [Degrees of restriction for two-dimensional automata](#). In S. Maneth, editor, *Proceedings of the 25th International Conference on Implementation and Application of Automata (CIAA 2021)*, volume 12803 of *Lecture Notes in Computer Science*, pages 77–89, Bremen, Germany. Springer, Jul. 2021.
- [C4] Taylor J. Smith and Kai Salomaa. [Concatenation operations and restricted variants of two-dimensional automata](#). In T. Bureš et al., editors, *Proceedings of the 47th International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM 2021)*, volume 12607 of *Lecture Notes in Computer Science*, pages 147–158, Bolzano-Bozen, Italy. Springer, Jan. 2021.
- [C3] Taylor J. Smith and Kai Salomaa. [Recognition and complexity results for projection languages of two-dimensional automata](#). In G. Jirásková and G. Pighizzini, editors, *Proceedings of the 22nd International Conference on Descriptive Complexity of Formal Systems (DCFS 2020)*, volume 12442 of *Lecture Notes in Computer Science*, pages 206–218, Vienna, Austria. Springer, Aug. 2020.
- [C2] Taylor J. Smith and Kai Salomaa. [Decision problems for restricted variants of two-dimensional automata](#). In M. Hospodár and G. Jirásková, editors, *Proceedings of the 24th International Conference on Implementation and Application of Automata (CIAA 2019)*, volume 11601 of *Lecture Notes in Computer Science*, pages 222–234, Košice, Slovakia. Springer, Jul. 2019.
- [C1] Da-Jung Cho, Yo-Sub Han, Kai Salomaa, and Taylor J. Smith. [Site-directed insertion: Decision problems, maximality and minimality](#). In S. Konstantinidis and G. Pighizzini, editors, *Proceedings of the 20th International Conference on Descriptive Complexity of Formal Systems (DCFS 2018)*, volume 10952 of *Lecture Notes in Computer Science*, pages 49–61, Halifax, Canada. Springer, Jul. 2018.

### Technical Reports

- [R1] Taylor J. Smith. [Two-dimensional automata](#). Technical report 2019-637, School of Computing, Queen’s University, Kingston, Canada, Jan. 2019. 27pp.

### Theses

- [T3] Taylor J. Smith. [Closure, decidability, and complexity results for restricted variants of two-dimensional automata](#). PhD thesis, Queen’s University, 2021. xi+147pp.
- [T2] Taylor J. Smith. [Properties of two-dimensional words](#). Master’s thesis, University of Waterloo, 2017. vii+58pp.
- [T1] Taylor J. Smith. [A study of solid hypercodes](#). Bachelor’s thesis, University of Western Ontario, 2015. v+30pp.

## Presentations and Seminars

### Conference Presentations

- [Degrees of restriction for two-dimensional automata](#). Presented at *International Conference on Implementation and Application of Automata (CIAA 2021)*, Bremen, Germany (virtual conference), Jul. 2021.
- [Concatenation operations and restricted variants of two-dimensional automata](#). Presented at *International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM 2021)*, Bolzano-Bozen, Italy (virtual conference), Jan. 2021.
- [Decision problems for restricted variants of two-dimensional automata](#). Presented at *International Conference on Implementation and Application of Automata (CIAA 2019)*, Košice, Slovakia, Jul. 2019.
- [Site-directed insertion: Decision problems, maximality and minimality](#). Presented at *International Conference on Descriptive Complexity of Formal Systems (DCFS 2018)*, Halifax, Canada, Jul. 2018.

### Conference Presentations (with no corresponding article)

- [Extending the Lyndon-Schützenberger theorem](#). Presented at *Southern Ontario Graduate Mathematics and Statistics Conference (SOGMSC 2016)*, Guelph, Canada, Jun. 2016.
- [Solid hypercodes](#). Presented at *University of Western Ontario Research in Computer Science (UWORCS 2015)*, London, Canada, Apr. 2015.

### Seminars

- [Some results on words in two dimensions](#). Presented at *Queen's University Formal Languages & Automata Theory seminar*, Kingston, Canada, Oct. 2017.
- [Periodicity in rectangular arrays](#). Presented at *University of Waterloo Algorithms & Complexity seminar*, Waterloo, Canada, Apr. 2016.

## Teaching

For more details, please see my [Teaching Portfolio](#).

### Instructor

<i>Fall 2021</i>	CSCI 356: Theory of Computing CSCI 541: Theory of Computing CSCI 550: Approximation Algorithms
<i>Winter 2019</i>	CISC 203: Discrete Mathematics for Computing II (49 students, rated 4.7/5.0)
<i>Spring 2017</i>	CS 240: Data Structures and Data Management (340 students, rated 4.3/5.0)

### Teaching Assistant

<i>2017–2021</i>	CISC 203: Discrete Mathematics for Computing II (2×) CISC/CMPE 223: Software Specifications (3×) CISC 462: Computability and Complexity (2×)
<i>2015–2017</i>	CS 234: Data Types and Structures (2×) CS 240: Data Structures and Data Management (2×) CS 462/662: Formal Languages and Parsing (1×)

## Professional Development

- 2020 Certificate in Professional Development in University Teaching and Learning  
Centre for Teaching and Learning, Queen's University
- 2018 Certificate in Professional Development  
School of Graduate Studies, Queen's University
- 2016 Fundamentals of University Teaching Program  
Centre for Teaching Excellence, University of Waterloo

## Service

### Committees

- 2020 Graduate Committee, School of Computing, Queen's University
- 2017–2020 School of Computing Council, Queen's University
- 2016–2017 Graduate Studies Committee, Faculty of Mathematics, University of Waterloo
- 2014–2015 Curriculum Committee, Department of Computer Science, University of Western Ontario

### Conferences and Seminars

- 2018 Program Committee Chair, Queen's Computing Student Research Conference (CSearch)
- 2015–2017 Organizer, Algorithms and Complexity Open Problems Seminar, University of Waterloo
- 2015 Organizing Committee Chair, Western Computer Science Academic Colloquium

### Outreach

- 2017 Judge, Western Student Research Conference (WSRC)

### Professional Memberships

- 2016–present Student Member, Association for Computing Machinery (ACM)
- 2016–present Student Member, Institute of Electrical and Electronics Engineers (IEEE)

### Refereeing and Reviewing

- Referee *Information and Computation*  
*Mathematical Reviews*
- External reviewer Conference on Implementation and Application of Automata (CIAA)  
Descriptive Complexity of Formal Systems (DCFS)  
Developments in Language Theory (DLT)  
Current Trends in Theory and Practice of Computer Science (SOFSEM)  
Symposium on Theoretical Aspects of Computer Science (STACS)

### Miscellaneous

- 2019–2020 President, Queen's Graduate Computing Society
- 2017–2020 Department Representative, Queen's Society of Graduate and Professional Students
- 2017–2019 Vice President (University Affairs), Queen's Graduate Computing Society

### Honours and Awards

- 2020 Ian A. Macleod Award, School of Computing, Queen's University (C\$650)
- 2020 TA/TF Excellence Award, Queen's Society of Graduate & Professional Students
- 2019 Sheng Yu Award for Best Paper, CIAA 2019 (€250)
- 2018 Excellence in Teaching Assistance Award, School of Computing, Queen's University

- 2017 Associate Member, Sigma Xi Scientific Research Honour Society
- 2015 Szilard Award in Theoretical Computer Science, University of Western Ontario (C\$1 000)
- 2015 First place in session, UWORCS 2015

### **Other Information**

*Erdős number* 2 (via Jeffrey Shallit)

*Personal interests* Board games and chess; recreational running and cycling; language learning (particularly French); piano and music theory. Curator of the [Montréal 1976 Olympic Collection](#).