CURRICULUM VITAE

Herman Goulet-Ouellet 🆔

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Employment

Postdoctoral researcher. 2024–2025 (ongoing)

Czech Technical University, Czech Republic. Funded by the CTU Global Postdoc Fellowship program. With Štěpán Starosta.

Postdoctoral researcher. 2023

IRIF, France. Funded by the ANR CODYS project (ANR-18-CE40-0007). With Valérie Berthé.

Education

PhD in Mathematics. With highest praise (*com Distinção e Louvor*). 2022

University of Coimbra, Portugal.

THESIS: Schützenberger groups of minimal shift spaces.

ADVISORS: Jorge Almeida and Alfredo Costa.

Master in Mathematics. With highest praise (*Excellent*). 2018

Université du Québec à Montréal, Canada.

ADVISOR: Franco Saliola.

Bachelor in Mathematics. 2016

Université du Québec à Montréal, Canada.

Diploma of College Studies in Computer science and mathematics. 2013

Collège de Maisonneuve, Montreal, Canada.

Publications

Papers

V. Berthé and H. Goulet-Ouellet. **Obstructions to return preservation for episturmian morphisms**. *Theory of Computing Systems* (2024). doi: 10.1007/s00224-024-10190-y. arXiv: 2404.08072.

V. Berthé and H. Goulet-Ouellet. **On substitutions preserving their return sets**. In: *Combinatorics on Words*. Ed. by A. Frid and R. Mercas. vol. 13899. Lecture Notes in Computer Science. 2023. doi: 10.1007/978-3-031-33180-0_6. hal: hal-04311379.

J. Almeida, H. Goulet-Ouellet, and O. Klíma. **What makes a Stone topological algebra profinite**. *Algebra Universalis*, vol. 84, no. 1 (2023). doi: 10.1007/s00012-023-00804-w. arXiv: 2109.07286v1.

H. Goulet-Ouellet. **Freeness of Schützenberger groups of primitive substitutions**. *International Journal of Algebra and Computations*, vol. 32, no. 06 (2022), pp. 1101–1123. doi: 10.1142/S0218196722500473. arXiv: 2109.11957v1.

H. Goulet-Ouellet. **Pronilpotent quotients associated with primitive substitutions**. *Journal of Algebra*, vol. 606 (2022), pp. 341–370. doi: 10.1016/j.jalgebra.2022.05.021. arXiv: 2204.05706v1.

H. Goulet-Ouellet. **Suffix-connected languages**. *Theoretical Computer Science*, vol. 923 (2022), pp. 126–143. doi: 10.1016/j.tcs.2022.05.001. arXiv: 2106.00452v1.

Preprints

F. Gheeraert, H. Goulet-Ouellet, J. Leroy, and P. Stas. **Stability properties for subgroups generated by return words**. 2024. arXiv: 2410.12534.

V. Berthé, H. Goulet-Ouellet, C.-F. N. Brodda, D. Perrin, and K. Petersen. **Density of group languages in shift spaces**. 2024. arXiv: 2403.17892.

F. Gheeraert, H. Goulet-Ouellet, J. Leroy, and P. Stas. **Algebraic characterization of dendricity**. 2024. arXiv: 2406.15075.

——— Teaching experience ———

Profinite methods in symbolic dynamics.   2025 (upcoming)
5th edition of the CANT school, Marseilles. Duration: 3 h.

Teacher.   2024 (in progress)
Czech Technical University in Prague. Probability and Mathematical statistics.

Introduction to SageMath.   2024
Czech Technical University in Prague. Duration: 2 h.

Teaching assistant.   2023
Université Paris Cité. Object Oriented Programming in Java.

Mini course on profinite monoids and symbolic dynamics.   2023
IRIF, Paris. Duration: 6 h.

Teaching assistant.   2015–2018
Université du Québec à Montréal.

- 2018   Advanced linear algebra (teaching, grading)
- 2017   Theory of equations (teaching, grading); Matrix algebra (grading)
- 2016   Theory of equations (teaching)
- 2015   Matrix algebra (grading) ; Algorithmics (teaching, grading)

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—— Talks ——

Conferences

Facteurs bispéciaux dans les systèmes D0L et comment les calculer. Feb. 2025 (upcoming)
Journées de combinatoire de Bordeaux 2025, France.

Relative invertibility for primitive substitutions.   Jul. 3, 2024
Theoretical and Computational Algebra 2024, Aveiro, Portugal.

Profinite bridges between semigroup theory and symbolic dynamics.   Jun. 20–21, 2024
North British Semigroups and Applications Network 2024, Manchester, United Kingdom.

Return words and derived sequences.   May. 17, 2024
Student conference on Combinatorics on Words, Janov nad Nisou, Czech Republic.

Profinite approach to conjugacy of substitutive shifts..   Jul. 5, 2023
Dyadisc 6, Amiens, France.

On substitutions preserving their return sets.   Jun. 15, 2023
Words 2023, Umeå, Sweden.

Forays beyond dendricity.   May. 26, 2023
Numeration 2023, Liège, Belgium.

Pronilpotent quotients associated with primitive substitutions.   Sept. 5, 2022
18$^{\text{th}}$ Mons Theoretical Computer Science Days, Prague, Czech Republic.

A pronilpotent look at maximal subgroups of free profinite monoids.   Jun. 24, 2022
Topology, Algebra, and Categories in Logic (TACL), Coimbra, Portugal.

Suffix-connected languages. Online.   Jul. 12–16, 2021
Encontro Nacional da Sociedade Portuguesa de Matemática, Portugal.

Suffix-connected languages. Online. Poster.   Jul. 8–9, 2021
Dyadisc4, Amiens, France.

Seminars

Density of group languages in shift spaces.   Jun. 27, 2024
Algebra logic and topology seminar, University of Coimbra, Portugal.

Density of group languages in minimal shifts. Online.   Jan. 30, 2024
SymPA seminar, Université de Picardie Jules Verne, France.

Densité des langages rationnels dans les espaces symboliques.   Jan. 12, 2024
LACIM seminar, UQAM, Canada.

Density of rational languages under invariant measures. Online.   Oct. 24, 2023
One World Combinatorics on Words seminar.

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Obstructions to return preservation for episturmian morphisms.   Sept. 29, 2023
Discrete Mathematics seminar, ULiège, Beligum.

Monoïdes profinis et dynamique symbolique.   Aug. 25, 2023
LACIM seminar, UQAM, Canada.

What lies inside free profinite monoids.   Apr. 21, 2023
Automata and applications seminar, Université Paris Cité, France.

Freeness of Schützenberger groups of primitive substitutions. Online.   Apr. 29, 2022
Semigroups, automata and languages seminar, University of Porto, Portugal.

—— Awards ——

PhD scholarship. Duration: 4 years.   2018
Fundação para a Ciência e a Tecnologia.

Scholarship – 2nd cycle. Duration: 1 year.   2017
Fonds de recherche du Québec – Nature et technologies.

Alexander Graham Bell Canada Graduate Scholarships. Duration: 1 year.   2016
Natural Sciences and Engineering Research Council of Canada.

Undergraduate Student Research Award. Duration: 15 weeks.   2014, 2015 and 2016
Natural Sciences and Engineering Research Council of Canada.

—— For the scientific community ——

Event organization

Algebraic aspects of symbolic dynamics.   Jul. 2024
Thematic session in the conference on Theoretical and Computational Algebra (Portugal).

Refereeing and reviews

Journals. European Journal of Combinatorics, Publicacions Matemàtiques.

Conferences. CIAA 2024.

MathSciNet. MR4587910, MR4525309, MR4486114, MR4661008.

—— Programming ——

- Python
- Haskell
- C++
- Java
- SageMath
- Git
- LaTeX
- GAP

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