#### CURRICULUM VITAE

## Herman Goulet-Ouellet ®

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# Employment –

#### Postdoctoral researcher.

2024-2026 (ongoing)

Czech Technical University, Czech Republic. Funded by the <u>CTU Global Postdoc Fellowship</u> 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**

F. Gheeraert, H. Goulet-Ouellet, J. Leroy, and P. Stas. **Algebraic characterization of dendricity**. *Electron. J. Comb.* (2025). To appear. arXiv: <u>2406.15075</u>.

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.

### Teaching experience

Profinite methods in symbolic dynamics.

2025 (upcoming)

5th edition of the CANT school, Marseilles. Duration: 3 h.

Teacher. 2024

Czech Technical University in Prague. Probability and Mathematical statistics.

Introduction to SageMath.

2024

2023

Czech Technical University in Prague. Duration: 2 h.

Teaching assistant.

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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### Conferences

Facteurs bispéciaux dans les systèmes DOL et comment les calculer. Journées de combinatoire de Bordeaux 2025, France.	Feb. 3, 2025	
Relative invertibility for primitive substitutions. Theoretical and Computational Algebra 2024, Aveiro, Portugal.	Jul. 3, 2024	
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. Student conference on Combinatorics on Words, Janov nad Nisou, Czecl	May. 17, 2024 h Republic.	
Profinite approach to conjugacy of substitutive shifts  Dyadisc 6, Amiens, France.	Jul. 5, 2023	
On substitutions preserving their return sets. Words 2023, Umeå, Sweden.	Jun. 15, 2023	
Forays beyond dendricity. Numeration 2023, Liège, Belgium.	May. 26, 2023	
Pronilpotent quotients associated with primitive substitutions.  18 <sup>th</sup> Mons Theoretical Computer Science Days, Prague, Czech Republic.	Sept. 5, 2022	
A pronilpotent look at maximal subgroups of free profinite monoids.  Topology, Algebra, and Categories in Logic (TACL), Coimbra, Portugal.	Jun. 24, 2022	
Suffix-connected languages. Online. Encontro Nacional da Sociedade Portuguesa de Matemática, Portugal.	Jul. 12-16, 2021	
Suffix-connected languages. Online. Poster. Dyadisc4, Amiens, France.	Jul. 8-9, 2021	
Seminars		
Densités des langages à groupe sous les mesures ergodiques. Ernest seminar, Institut de mathématiques de Marseille, France.	Mar. 4, 2025	
Density of group languages under ergodic measures.  Automata and applications seminar, Université Paris Cité, France.	Feb. 28, 2025	
Inversibilité relative des substitutions. SymPA seminar, Université de Picardie Jules Verne, France.	Feb. 25, 2025	
Density of group languages in shift spaces.  Algebra logic and topology seminar, University of Coimbra, Portugal.	Jun. 27, 2024	

Density of group languages in minimal shifts. Online. SymPA seminar, Université de Picardie Jules Verne, France.	Jan. 30, 2024
Densité des langages rationnels dans les espaces symboliques. LACIM seminar, UQAM, Canada.	Jan. 12, 2024
Density of rational languages under invariant measures. Online.  One World Combinatorics on Words seminar.	Oct. 24, 2023
Obstructions to return preservation for episturmian morphisms.  Discrete Mathematics seminar, ULiège, Beligum.	Sept. 29, 2023
Monoïdes profinis et dynamique symbolique. LACIM seminar, UQAM, Canada.	Aug. 25, 2023
What lies inside free profinite monoids. Automata and applications seminar, Université Paris Cité, France.	Apr. 21, 2023
Freeness of Schützenberger groups of primitive substitutions. Online. Semigroups, automata and languages seminar, University of Porto, Portuga	Apr. 29, 2022 al.

#### - Awards -

PhD scholarship. Duration: 4 years.

2018

Fundação para a Ciência e a Tecnologia.

Scholarship - 2<sup>nd</sup> 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 —

PythonHaskell

• C++

SageMathGit

Java

LaTeXGAP