

Corentin Lunel

PhD Student

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Born on December 24th, 1996
French citizen
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Research Interests

I am motivated by topics at the interface of mathematics and theoretical computer science. My main interest is computational topology which is a field in between low dimensional topology and algorithms. I aim at exploring the interactions between graphs and knots from a computational point of view.

Employment and Education

- 2021-Present** *LIGM, Université Gustave Eiffel*: PhD thesis: "Tree-like decompositions and knot theory: structure and algorithms" under the supervision of Arnaud De Mesmay and Pierre Dehornoy. I expect to defend before october 2024.
- 2017-2021** *École Normale Supérieure de Lyon*, scholarship at ENSL:
- 2020-2021 ENSL M2 of theoretical computer science.
Internship with Arnaud de Mesmay at *LIGM*: "From decomposing graphs to sweeping knots".
 - 2019-2020 ENSL M1 of Mathematics.
Internship with Olga Kravchenko at *Université Lyon 1*: "Le polynôme d'Alexander vu par les graphes bipartis".
 - 2018-2019 ENSL M1 of theoretical computer science.
Internship with Uli Wagner at *Institute of Science and Technology Austria*: "Expander graphs and high dimensional Expanders".
 - 2017-2018 ENSL M2 of theoretical computer science.
Internship with Arnaud de Mesmay at *Gipsa-lab*: "Réduction monotone de noeuds".
- 2014-2017** *Toulouse*, Higher school preparatory classes at Lycée Pierre de Fermat

Awards

- 2022** Best PhD student talk at ED MSTIC day.
2017 Junior Fermat prize for mathematical research.

Publication

Articles in conferences

1. *Hopf Arborescent Links, Minor Theory, and Decidability of the Genus Defect*, with Pierre Dehornoy and Arnaud de Mesmay, Proceedings of the 40th Symposium on Computational Geometry (SoCG 2024, to appear, invited to a DCG special issue on SoCG 2024), <https://arxiv.org/abs/2312.09094>.

2. *A Structural Approach to Tree Decompositions of Knots and Spatial Graphs*, with Arnaud de Mesmay, Proceedings of the 39th Symposium on Computational Geometry (SoCG 2023), <https://arxiv.org/abs/2303.07982>.

Articles in journals

3. *Etude d'un invariant des noeuds alternés et mise en oeuvre informatique*, in french, with Hugo Fages and Quentin Rembert, *Quadrature* 112 (2019) p23-31.

Presentations

- Journées du GdR IFM (poster), Grenoble, France, 2024.
- Journées Graphes et Algorithmes, Lyon, France, 2023.
- International symposium of Computational Geometry, Dallas, Texas, USA, 2023.
- SOS Workshop, Dagstuhl, Germany, 2023.
- ED MSTIC PhD Student day, best presentation, Paris, 2022.
- Journée de Géométrie Algorithmique, online, 2022.
- AMS-EMS-SMF Joint Congress of Mathematics, Grenoble, France, 2022.

Teaching

2022-2024	Algorithms course, exercise and practical sessions, 48 hours, ESIPÉ, first year.
2021-2023	Algorithms and tree data structures, exercise sessions, 22 hours, L2 course at Université Gustave Eiffel.
2021-2022	Lab math-info, exercise and practical sessions, 40 hours, L2 course at Université Gustave Eiffel.

Reviews

- I reviewed a paper for SoCG 2023.

Skills

Spoken languages

- French, native speaker.
- English, fluent (Certificate in Advanced English, C1).
- German, school level (B1).

Programming languages

- C
- Python
- OCaml
- LaTeX