

Julien Calbert

Postdoctoral researcher in Mathematical Engineering, UCLouvain, Louvain-la-Neuve, Belgium
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RESEARCH INTERESTS

Symbolic control, Abstraction, Data-driven control, Optimization

EDUCATION

Postdoctoral researcher in Mathematical Engineering 2024 — Present
UCLouvain, Louvain-la-Neuve, Belgium
Supervisor Pr. Raphaël Jungers

Ph.D. student in Mathematical Engineering 2020 — 2024
UCLouvain, Louvain-la-Neuve, Belgium
FRIA/FNRS Fellow
Supervisor Pr. Raphaël Jungers

Master's Degree in Mathematical Engineering: Applied mathematics 2018 — 2020
UCLouvain, Louvain-la-Neuve, Belgium
Honours obtained: magna cum laude

Bachelor's Degree in Engineering: Applied mathematics 2015 — 2018
UCLouvain, Louvain-la-Neuve, Belgium
Honours obtained: summa cum laude

TEACHING EXPERIENCE

UCLouvain, Louvain-la-Neuve, Belgium 2020 — Present
Teaching Assistant

- LEPL1101: Algèbre linéaire (BAC 1)
- LINMA2380: Matrix computations (Master 1)
- LEPL1103: EDPs et analyse complexe (BAC 2)

I gave some lectures for each of these courses in front of an audience.

LANGUAGES

- **French:** First language
- **English:** Fluent

PUBLICATIONS

Journal Papers

- Julien Calbert, Antoine Girard, Raphaël M. Jungers, **Classification of simulation relations for symbolic control**, *Automatica*, 2024 (**submitted**).
- Julien Calbert, Adrien Banse, Benoît Legat, Raphaël M. Jungers, **Dionysos. jl: a Modular Platform for Smart Symbolic Control**, *JuliaCon Proceedings*, 2024.
- Julien Calbert, Lucas Egidio, Raphaël M. Jungers, **Smart abstraction based on iterative cover and non-uniform cells**, *IEEE Control Systems Letters (L-CSS)*, 2024.

Conference papers

- Julien Calbert, Sébastien Mattenet, Antoine Girard, Raphaël M. Jungers, **Memoryless concretization relation**, *27th ACM International Conference on Hybrid Systems: Computation and Control (HSCC)*, 2024.
- Julien Calbert, Lucas Egidio, Raphaël M. Jungers, **An Efficient Method to Verify the Inclusion of Ellipsoids**, *IFAC-PapersOnLine*, vol. 56, no 2, pp. 1958-1963, 2023.
- Julien Calbert, Raphaël M. Jungers, **Data-driven heuristic symbolic models and application to limit-cycle detection**, *2023 American Control Conference (ACC)*, pp. 4351-4356, 2023.
- Julien Calbert, Benoît Legat, Lucas Egidio, Raphaël M. Jungers, **Alternating simulation on hierarchical abstractions**, *2021 60th IEEE Conference on Decision and Control (CDC)*, pp. 593-598, 2021.

- Wei Ren, Julien Calbert, Raphaël M. Jungers, **Zonotope-based controller synthesis for LTL specifications**, *2021 60th IEEE Conference on Decision and Control (CDC)*, pp. 580-585, 2021.

Thesis

- Julien Calbert, **Abstraction Relations over Dynamical Systems: Theory and Algorithms**, *PhD. Thesis*, Under the direction of Prof. Raphaël M. Jungers, UCLouvain, 2024.
- Julien Calbert, **Learning integral operators from diagonal-circulant neural networks**, *Master Thesis*, Under the direction of Prof. Laurent Jacques and Prof. Pierre-Antoine Absil, UCLouvain, 2020.

Lecture materials

- Julien Calbert, Rémi Delogne, Charles Monnoyer de Galland, Raphaël M. Jungers, **LEPL1101-Algèbre linéaire**, *Syllabus*, UCLouvain, 2023.

AWARDS

FRIA/FNRS Grant for doctoral research

2020 — 2024

Organization: Belgian National Fund for Scientific Research

SKILLS

- **Programming:** Julia, Python, Matlab, C, C++, Java
- **Academic Writing:** Experience in preparing and authoring lecture materials for Bachelor's and Master's courses in Applied Mathematical Engineering.
- **Soft Skills:** Demonstrated leadership, teamwork, and resilience through ongoing training as a reserve officer candidate in the Belgian Army (2024–present), active involvement as a staff member in a scout group, participation in marathons (e.g., Athens 2023, Gent 2024), and commitment to sports such as swimming, futsal, and badminton.