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# *Curriculum Vitae*

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**Sébastien Fueyo**

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## 1 Civil status

First name : Sébastien

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## 2 Language spoken

- French (mother tongue), english (fluent).

## 3 Positions held

- **September 2024 -** : CNRS Postdoctoral Researcher (GIPSA-lab).  
Supervisor : Carlos Canudas-de-Wit.  
Research topic : Analysis of the continuation method applied to the control of large networks arising from road traffic.
- **October 2022 - January 2024** : Postdoctoral Researcher at Tel Aviv University (Israel).  
Supervisor : George Weiss.  
Research topic : Well-posedness of input-output systems with state variables constrained within a closed convex set.
- **May 2021 - September 2022** : Postdoctoral Researcher at Université Paris-Saclay and INRIA (LJLL).  
Supervisors : Yacine Chitour and Mario Sigalotti.  
Research topic : Controllability of time-delay systems and 1-D hyperbolic PDEs *via* algebraic methods (Bézout identities) and transfer functions.
- **January 2021 - May 2021** : Postdoctoral Researcher at CentraleSupélec.  
Supervisor : Islam Boussaada.  
Research topic : Stabilization of delayed equations with bounded gains.
- **2016 - 2020** : PhD Candidate under contract at INRIA (2016-2019, Sophia-Antipolis), then Temporary Teaching and Research Assistant (part-time, 2019-2020, Université Côte d'Azur)  
Supervisors : Laurent Baratchart and Jean-Baptiste Pomet.  
Research topic : Stability of high-frequency amplifiers using the harmonic transfer function.

## 4 Studies

- **2016-2020** : PhD in applied mathematics, (INRIA Sophia-Antipolis).
  - Title : «Time-varying delay systems and 1-D hyperbolic equations, Harmonic transfer function and nonlinear electric circuits»,
  - Supervisors : Laurent Baratchart (INRIA) and Jean-Baptiste Pomet (INRIA).

- PhD Defense : 30 october 2020 in Sophia Antipolis (INRIA) in front of a committee composed of :

|                        |                                          |            |
|------------------------|------------------------------------------|------------|
| Yacine Chitour         | Université Paris-Saclay                  | Rapporteur |
| Jonathan R. Partington | University of Leeds                      | Rapporteur |
| Birgit Jacob           | Bergische Universität Wuppertal          | Examiner   |
| Hoài-Minh Nguyễn       | Ecole Polytechnique Fédérale de Lausanne | Examiner   |
| Almudena Suárez        | Universidad de Cantabria                 | Examiner   |
| Marius Tucsnak         | Université de Bordeaux                   | President  |
| Adam Cooman            | Ampleon                                  | Guest      |

- **2015-2016** : Master 2 MDFI mathematics and foundation of computing (Aix-Marseille-Université, Marseille), with honors (ranking : 2nd)
- **2014-2015** : Master 2 PDEs and scientific computing (Aix-Marseille-Université, Marseille), with honors (ranking : 2nd)
- **2013-2014** : Agrégation de mathématiques (Aix-Marseille-Université, Marseille), (ranking 149-th).

## 5 Preprint

- [Pre1] **Sébastien Fuego**. Hale-Silkowski criterion for exact controllability of difference delay systems and 1-D hyperbolic PDEs. Preprint, December 2024. URL : <https://hal.science/hal-04830757/document>.
- [Pre2] **Sébastien Fuego**, Laurent Baratchart, and Jean-Baptiste Pomet. Monodromy Structure and Harmonic Transfer Function in Lossless Transmission Line Circuits. working paper or preprint, 2025. URL : <https://hal.science/hal-05042937>.
- [Pre3] **Sébastien Fuego** and Carlos Canudas de Wit. Continuum Control Design for Traffic Flow Stabilization on Circular Roads : A Microscopic-Macroscopic Approach  $\star$ . working paper or preprint, July 2025. URL : <https://hal.science/hal-05180508>.

## 6 Article published in a peer-reviewed journal

- [PUB1] Laurent Baratchart, **Sébastien Fuego**, Gilles Lebeau, and Jean-Baptiste Pomet. Sufficient Stability Conditions for Time-varying Networks of Telegrapher’s Equations or Difference Delay Equations. *SIAM Journal on Mathematical Analysis*, 2021. Q1 in Analysis, applied mathematics and computational mathematics. SRJ 1.994. Impact Factor 1.937. URL : [https://hal.inria.fr/hal-02385548v3/file/papier\\_SIMA\\_stab\\_HAL.pdf](https://hal.inria.fr/hal-02385548v3/file/papier_SIMA_stab_HAL.pdf), doi:10.1137/19M1301795.
- [PUB2] Laurent Baratchart, **Sébastien Fuego**, and Jean-Baptiste Pomet. Exponential stability of linear periodic difference-delay equations. *SIAM Journal on Mathematical Analysis*, 57(3) :3110–3145, 2025. Q1 in Analysis, applied mathematics and computational mathematics. SRJ 1.994. Impact Factor 1.937. URL : <https://inria.hal.science/hal-03500720v5/file/papiergeneralisationhale.pdf>.
- [PUB3] Laurent Baratchart, **Sébastien Fuego**, and Jean-Baptiste Pomet. Integral representation formula for linear nonautonomous difference-delay equations. *Journal of Integral Equations*

- and Applications*, 36(4) :407 – 418, 2024. Q3 in applied mathematics. SRJ 0.4. Impact Factor 0.974. URL : <https://hal.science/hal-04204500/document>, doi:10.1216/jie.2024.36.407.
- [PUB4] Yacine Chitour, **Sébastien Fueyo**, Guilherme Mazanti, and Mario Sigalotti. Approximate and exact controllability criteria for linear one-dimensional hyperbolic systems. *Systems Control Letters*, 190 :105834, 2024. Q1 in Control and Systems Engineering. SRJ 1.501. URL : <https://arxiv.org/pdf/2310.04088>, doi:10.1016/j.sysconle.2024.105834.
- [PUB5] Yacine Chitour, **Sébastien Fueyo**, Guilherme Mazanti, and Mario Sigalotti. Hautus–yamamoto criteria for approximate and exact controllability of linear difference delay equations. *Discrete and Continuous Dynamical Systems*, 43(9) :3306–3337, 2023. Q1 in Analysis, applied mathematics and discrete mathematics and combinatorics. SRJ 1.13. Impact Factor 1.588. URL : <https://hal.science/hal-03827918v2/document>, doi:10.3934/dcds.2023049.
- [PUB6] Shantanu Singh, **Sébastien Fueyo**, and George Weiss. Projected incrementally scattering passive systems on closed convex sets. *Systems & Control Letters*, 197 :106033, 2025. Q1 in Control and Systems Engineering. SRJ 1.501. URL : <https://www.sciencedirect.com/science/article/pii/S0167691125000155>, doi:10.1016/j.sysconle.2025.106033.
- [PUB7] **Sébastien Fueyo** and Carlos Canudas-de Wit. From Microscopic Driver Models to Macroscopic PDEs in Ring Road Traffic Dynamics. *European Journal of Control*. To appear. Q1 in Control and Systems Engineering. SRJ 0.811. URL : <https://hal.science/hal-04806729/document>.
- [PUB8] **Sébastien Fueyo** and Yacine Chitour. A corona theorem for an algebra of Radon measures with an application to exact controllability for linear controlled delayed difference equations. *Comptes Rendus. Mathématique*, 362 :851–861, 2024. Q2 in Mathematics. SRJ 0.66. URL : <https://comptes-rendus.academie-sciences.fr/mathematique/item/10.5802/crmath.604.pdf>, doi:10.5802/crmath.604.
- [PUB9] **Sébastien Fueyo**, Guilherme Mazanti, Islam Boussaada, Yacine Chitour, and Silviu-Iulian Niculescu. On the pole placement of scalar linear delay systems with two delays. *IMA Journal of Mathematical Control and Information*, 40(1) :81–105, 2023. Q2 in control and systems engineering. SRJ 0.44. Impact Factor 1.54. URL : <https://hal.science/hal-03669644v2/document>, doi:10.1093/imamci/dnad001.
- [PUB10] **Sébastien Fueyo**.  $L^q$  approximate controllability frequency criterion for linear difference delay equations with distributed delays. *Mathematics of Control, Signals, and Systems*, May 2025. Q1 in Applied Mathematics, Control and Optimization, Control and Systems Engineering, and Signal Processing. SRJ 1.246. doi:10.1007/s00498-025-00418-8.
- [PUB11] **Sébastien Fueyo**. Left-coprimeness condition for the reachability in finite time of pseudo-rational systems of order zero with an application to difference delay systems. *Systems & Control Letters*, 198 :106051, 2025. Q1 in Control and Systems Engineering. SRJ 1.501. URL : <https://arxiv.org/pdf/2409.12767>, doi:10.1016/j.sysconle.2025.106051.

## 7 Article published in an act of congress

- [PUBC1] Laurent Baratchart, **Sébastien Fueyo**, and Jean-Baptiste Pomet. Exponential stability of periodic difference delay systems and 1-D hyperbolic PDEs of conservation laws. *TDS*

2022 - *IFAC 17th Time Delay Systems*, Montreal, Canada, September 2022. URL : <https://hal.science/hal-03792038v1/document>, doi:10.1016/j.ifacol.2022.11.362.

- [PUBC2] Shantanu Singh, **Sébastien Fueyo**, and George Weiss. Incrementally passive infinite dimensional systems with a constrained state variable. *CDC 2023 - 62th IEEE Conference on Decision and Control*, Singapore, Singapore, December 2023. URL : [https://www.researchgate.net/publication/376951082\\_Incrementally\\_passive\\_infinite\\_dimensional\\_systems\\_with\\_a\\_constrained\\_state\\_variable](https://www.researchgate.net/publication/376951082_Incrementally_passive_infinite_dimensional_systems_with_a_constrained_state_variable), doi:10.1109/CDC49753.2023.10383643.
- [PUBC3] **Sébastien Fueyo** and Carlos Canudas-de Wit. A Continuation-Based Control Strategy for Stabilizing Second-Order Macroscopic Traffic Flow on Circular Roads. *CDC (Conference on Decision and Control)*, 2025. To appear. URL : <https://hal.science/hal-04984782>.
- [PUBC4] **Sébastien Fueyo**, Guilherme Mazanti, Islam Boussaada, Yacine Chitour, and Silviu-Iulian Niculescu. Insights into the multiplicity-induced-dominancy for scalar delay-differential equations with two delays. *TDS 2021 - 16th IFAC Workshop on Time Delay Systems*, Guangzhou, China, September 2021. URL : <https://hal.archives-ouvertes.fr/hal-03298715v2/document>, doi:10.1016/j.ifacol.2021.11.124.

## 8 Thesis

- [FUEYOthesis1] **Sébastien Fueyo**. *Time-varying delay systems and 1-D hyperbolic equations, Harmonic transfer function and nonlinear electric circuits*. Thèse, Université Côte d’Azur, October 2020. URL : <https://hal.archives-ouvertes.fr/tel-03105344/document>.

## 9 Seminars and other presentations

- **ECC 2025**, Thessaloniki, Greece, title of the talk « From Microscopic Driver Models to Macroscopic PDEs in Ring Road Traffic Dynamics »
- Mini-course, **April 7–11, 2025, Spring School in Aussois**, Aussois, France, entitled “Algebraic Methods for the Controllability of Some One-Dimensional Hyperbolic PDEs and Delay Systems” (5 hours).
- Talk, **6 december 2024, groupe de contrôle du LJLL**, Paris, France, title « Méthodes algébriques pour la contrôlabilité des EDP hyperboliques 1-D et des systèmes à retards ».
- Talk, **7 novembre 2024, équipe Inria Sphinx**, Inria centre à Université de Lorraine, Nancy, France, title « Algebraic methods for the controllability of 1-D hyperbolic PDEs and delay systems ».
- Talk, **5 novembre 2024, LS2N**, Nantes, France, title « Algebraic methods for the controllability of 1-D hyperbolic PDEs and delay systems ».
- **CDC 2023**, Singapore, Singapore, title of the talk «Incrementally passive infinite dimensional systems with a constrained state variable»
- **TDS 2022**, Montreal, Canada, title of the talk «Exponential stability of periodic difference delay systems and 1-D hyperbolic PDEs of conservation laws»

- **Benasque, IX Partial differential equations, optimal design and numerics 2022**, Benasque, Spain, title of the talk «Hautus-Yamamoto criteria for approximate and exact controllability of difference delay equations»
- **ICDEA 2022**, Paris, France, title of the talk « Hautus–Yamamoto criteria for approximate and exact controllability of difference delay equations »
- **TDS 2021**, title of the talk « Insights into the Multiplicity-Induced-Dominancy for Scalar Delay-Differential Equations with Two Delays »
- **IWOTA 2021**, title of the talk « Stability of periodic delay systems and harmonic transfer function ».
- **SYSID 2021**, title of the talk « Stability of Active Circuits Via Singularities of the Harmonic Transfer Function ».
- **French ERNSI workshop 2021**, title of the talk « Stability of high frequency amplifiers via singularities of the Harmonic Transfer Function ».
- **TDS 2019**, Sinaia, Roumania, title of the talk « On deciding stability of high frequency amplifiers ».
- **ERNSI 2018**, Cambridge, England, title of the poster « Checking the stability of amplifiers ».
- **ISMB/ECCB 2017**, Prague, Czech Republic, Poster title « Reversed dynamics to uncover basins of attraction of asynchronous logical models », [Lien F1000Posters](#).

## 10 Recommendation

- **Laurent Baratchart**, PhD supervisor, [laurent.baratchart@inria.fr](mailto:laurent.baratchart@inria.fr),
- **Jean-Baptiste Pomet**, PhD supervisor, [jean-baptiste.pomet@inria.fr](mailto:jean-baptiste.pomet@inria.fr)
- **Yacine Chitour**, Post-doctoral supervisor, [yacine.chitour@l2s.centralesupelec.fr](mailto:yacine.chitour@l2s.centralesupelec.fr),
- **Mario Sigalotti**, Post-doctoral supervisor, [mario.sigalotti@inria.fr](mailto:mario.sigalotti@inria.fr)
- **George Weiss**, Post-doctoral supervisor, [gweiss@tauex.tau.ac.il](mailto:gweiss@tauex.tau.ac.il)
- **Carlos Canudas-de-Wit**, Post-doctoral supervisor, [carlos.canudas-de-wit@gipsa-lab.grenoble-inp.fr](mailto:carlos.canudas-de-wit@gipsa-lab.grenoble-inp.fr)