

Benoît Bonnet

Curriculum Vitae (June 1, 2021)

INRIA Paris – Laboratoire Jacques-Louis Lions

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Married, no children

Research Positions

- Feb. 2021 – **INRIA postdoctoral fellow** under the supervision of M. Sigalotti and N. Pouradier-Duteil, *Laboratoire Jacques-Louis Lions*, Paris.
- Nov. 2019 – **CNRS postdoctoral fellow** under the supervision of H. Frankowska, *Institut de Mathématiques de Jussieu*, Paris.
- Oct. 2016 – **PhD student in Applied Mathematics** under the supervision of F. Rossi and M. Hauray, *Aix-Marseille Université, LIS - Università degli Studi di Padova*, Marseille, Padova.

Journal Publications and Conference Proceedings

- 2021 **A Measure Theoretical Approach to the Mean-Field Maximum Principle for Training NeurODEs**, (with C. Cipriani, M. Fornasier and H. Huang), *Work in progress*.
- 2021 **Continuity Inclusions with State-Constraints and Viability Theory** (with H. Frankowska), *Work in progress*.
- 2021 **Variance Optimization and Control Regularity for Mean-Field Dynamics** (with F. Rossi), *Proceedings Submission*.
- 2021 **On the Properties of the Value Function Associated to a Mean-Field Optimal Control Problem of Bolza Type** (with H. Frankowska), *Proceedings Submission*.
- 2021 **Semiconcavity and Sensitivity Analysis in Mean-Field Control and Applications** (with H. Frankowska), *Under revision*.
- 2021 **Intrinsic Lipschitz Regularity of Mean-Field Optimal Controls** (with F. Rossi), *To appear in SIAM Journal on Control and Optimization*.
- 2021 **Necessary Optimality Conditions for Optimal Control Problems in Wasserstein Spaces** (with H. Frankowska), *Applied Mathematics and Optimization*.
- 2021 **Consensus and Flocking Under Communication Failures for a Class of Cucker-Smale System** (with É. Flayac), *Systems and Control Letters*, 152, 104930.
- 2021 **Differential Inclusions in Wasserstein Spaces: The Cauchy Lipschitz Framework** (with H. Frankowska), *Journal of Differential Equations*, 271:594-637.
- 2020 **Mean-Field Optimal Control of Continuity Equations and Differential Inclusions** (with H. Frankowska), *In 2020 IEEE Conference on Decision and Control (CDC)*.
- 2019 **Generic Singularities of the 3D-contact Sub-Riemannian Conjugate Locus** (with J.-P. Gauthier and F. Rossi), *Comptes Rendus de l'Académie des Sciences*, 357(6):520-527.
- 2019 **A Pontryagin Maximum Principle in the Wasserstein Space for Constrained Optimal Control Problems**, *ESAIM COCV* 25(52).
- 2019 **The Pontryagin Maximum Principle in the Wasserstein Space** (with F. Rossi), *Calculus of Variations and Partial Differential Equations*, 58:11.
- 2017 **Sparse Control of Kinetic Cooperative Systems to Approximate Alignment** (with F. Rossi), *In Proceedings of the 20th IFAC World Congress*.

Presentations at International Conferences, Seminars and Workshops

- Mar. 2021 **Sufficient Conditions for the Lipschitz Regularity of Mean-Field Optimal Controls**, *Groupe de Travail de Calcul des Variations*, Paris.

- Mar. 2021 **Exponential Flocking for Cucker-Smale Systems with Communication Failures**, *Seminar of the MAMBA INRIA team, Université Pierre et Marie Curie, Paris.*
- Feb. 2021 **Continuity Inclusions and Applications in Multi-Agents Optimal Control**, *Seminar of Analysis and Applications, Laboratoire de Mathématiques de Bretagne Atlantique, Brest.*
- Dec. 2020 **Mean-Field Control and Continuity Inclusions**, *59th Conference on Decision and Control, Jeju Island, Korea (remote session from Paris).*
- May 2020 **Flocking for the Cucker-Smale System under Communication Failures**, *Seminar of the CAGE INRIA team, Université Pierre et Marie Curie, Paris.*
- Oct. 2019 **Intrinsic Lipschitz Regularity in Mean-Field Optimal Control**, *Seminar of Probability, Statistics and Control Theory, ENSTA Paris, Palaiseau.*
- Jun. 2019 **Some Problems in Modelling and Optimal Control of Multi-Agent Systems**, *Poster session of the conference "Crowds : models and control", Marseille.*
- Mar. 2019 **Topics in Analysis and Optimal Control of Multi-Agent Systems**, *Seminar of Analysis, Dipartimento di Matematica "Tullio Levi-Civita", Padova.*
- Feb. 2019 **Optimal Control of Multi-Agent Systems : A Pontryagin Approach**, *Winter School in Calculus of Variations and Probability Theory, Toulouse.*
- Jul. 2018 **Optimal Control Problems in Wasserstein Spaces**, *"Variational Analysis and Optimal Control" Invited Session, 14th Viennese Conference on Optimal Control and Dynamic Games, Vienna.*
- Jan. 2018 _____, *12th International Young Researcher Workshop on Geometry, Mechanics and Control, Padova.*
- Jul. 2017 **Sparse Alignment of Kinetic Cooperative Systems**, *IFAC World Conference, Toulouse.*

Teaching Activities

- 2020 – 2021 **Exercise sessions for the MIASHS Bachelor courses in *Optimisation***, *Université Paris 1 Panthéon-Sorbonne.*
- 2019 – 2021 **Exercise sessions for the Master course *Differentiable Optimisation – Theory and Algorithms***, *ENSTA Paris & Université Paris-Sud.*
- 2019 – 2020 **Exercise sessions for the Bachelor course *Quadratic Optimisation***, *ENSTA Paris.*
- 2017 – 2019 **Lectures of the Bachelor course *Introduction to Lebesgue Integration***, *École Centrale Marseille.*
- 2017 – 2019 **Lectures of the Bachelor course *Introduction to Continuous Optimization***, *École Centrale Marseille.*
- 2017 – 2018 **Exercise sessions for the Master course *Introduction to Optimisation Theory***, *École Centrale Marseille.*
- 2014 **Examiner for mathematics oral examination practice (khôlleur)**, *EPF.*

Grants

- 2021 – 2022 **15-month competitive postdoctoral fellowship from *INRIA***, *Laboratoire Jacques-Louis Lions.*
- 2016 – 2019 **3-year PhD grant from the *Archimède* French Excellence Laboratory**, *Aix-Marseille Université.*

Degrees

- Oct. 2019 **PhD degree in Applied Mathematics from Aix-Marseille Université on the topic "*Optimal Control in Wasserstein Spaces*"**, *Specialisation in Automation and Control Theory.*
- Sep. 2016 **Master degree in Applied Mathematics from Université Paris-Saclay**, *Specialisation in Optimisation.*
- Sep. 2016 **Master degree in Mathematical Engineering from ENSTA Paris**, *Specialisation in Control Theory and Optimisation.*
- Jul. 2011 **A-level validations**, *Specialisation in Mathematics.*

Education

- 2015 – 2016 **Student of the *Optimisation* MSc program of the Université Paris-Saclay, Université Paris-Sud, Orsay.**
- 2013 – 2016 **Student at the ENSTA Paris Engineering School, ENSTA Paris, Palaiseau.**
- 2011 – 2013 **Student in French “*Classe préparatoire aux Grandes Écoles*”, Lycée Blaise-Pascal, Orsay.**
- 2008 – 2011 **Highschool student, Lycée Descartes, Antony.**

Past Internships and Student Activities

Internships

- Apr. – Aug. 2016 **Research internship on the topic “*Stabilization and analysis of stick-slip phenomena in oil-drilling facilities*” under the supervision of Assistant Pr. Florent Di Meglio, École des Mines de Paris, Paris.**
- May – Aug. 2015 **Research internship on the topic “*Passive tracer transport in time-dependent corner flows*” under the supervision of Assistant Pr. Michal Branicki, University of Edinburgh, Edinburgh.**
- Jul. 2014 **One-month operator placement in the context of the first year curriculum at ENSTA Paris, Horiba Jobin Yvon SAS, Longjumeau.**

Student activities

- 2013 – 2015 **Member of the organisation teams of several scientific seminars addressed to visiting European students, ENSTA Paris, Palaiseau.**

Languages

- French **Mother tongue**
- English **Fluent (TOEIC score 980/990, C2-level CEFR)**
- Italian **Basics (intermittently lived in Italy for 2 years)**
- Chinese **Small remnants from my higher studies**

Miscellaneous Interests and Hobbies

- Playing the drums (10-year regular practice)
- Bouldering (indoor climbing)
- Socio-economic forecasting
- Philosophy of physics and mathematics
- Pool billiard (6-year regular practice)
- Video games, science-fiction & fantasy
- Bodhran (celtic traditional drum) & Guitar
- Bike travels
- Climate sciences (MyCO2 ambassador)
- Mesopotamian and medieval history
- Theatre (attending)
- Strategy-based boardgames