

CURRICULUM VITAE OF JOÃO MIGUEL MACHADO

Lagrange Mathematics and Computing Research Center, Paris
joao-miguel.machado@ceremade.dauphine.fr
jmmachado.github.io

RESEARCH INTERESTS

I am interested in the Calculus of Variations in a broad sense, as well as its relations to optimization, geometric measure theory, and partial differential equations of elliptic and parabolic types.

PROFESSIONAL EXPERIENCE & EDUCATION

Since October 2024: *Post-doctoral researcher in the Optimal Transportation team led by Guillaume Carlier, Alessio Figalli and Filippo Santambrogio, with close collaboration with Quentin Mérigot*
Lagrange Mathematics and Computation Research Center, Paris.

From September 2021 to October 2024: *PhD candidate under the supervision of Antonin Chambolle and Vincent Duval. My thesis is entitled "Optimization in Spaces of Measures: Optimal Transport, Geometric Structures and Game Theory".*

Université Paris-Dauphine and Inria team Mokaplan, Paris
Funding from the école doctorale SDOSE.

From September 2020 to September 2021: *M2 Optimisation at LMO (Laboratoire de Mathématiques d'Orsay).*

Université Paris-Dauphine and École Polytechnique
Funded by Sophie Germain program from FMJH and INRIA, Paris.

From 2016 to September 2020: *I worked in Brazil under the supervision of Professor Maria Soledad Aronna since my undergraduate studies in electrical engineering. This led to an internship at Inria Saclay, in the former COMANDS Inria team, under the supervision of Frédéric Bonnans and later led to a master diploma issued by FGV*

Fundação Getulio Vargas, Rio de Janeiro

RESEARCH WORKS

Preprints

3. **Absence of loops for the Wasserstein- \mathcal{H}^1 problem: the localization/blow-up argument.** To be submitted, 2025. ([link to HAL version](#))
2. **From Nash to Cournot-Nash via Γ -convergence** (joint work with Guilherme Mazanti and Laurent Pfeiffer). To be submitted, 2025. ([link to HAL version](#))
1. **The shooting algorithm for partially control-affine problems with application to an SIRS epidemiological model** (joint work with Maria Soledad Aronna). To be submitted. ([link to ArXiv version](#))

¹Updated May 13, 2025

Peer reviewed papers

3. **Phase-field approximation for 1-dimensional shape optimization problems.** Accepted for publication in SIAM journal of Mathematical Analysis, 2025. ([link to HAL version](#))
2. **One dimensional approximation of measures in Wasserstein distance.** (joint work with Antonin Chambolle and Vincent Duval). In *Journal de l'École Polytechnique-Mathématiques*, 2025. ([link to published version](#))
1. **The Total Variation-Wasserstein problem: A new derivation of the Euler-Lagrange equations.** (joint work with Antonin Chambolle and Vincent Duval). In *International Conference on Geometric Science of Information*, 2023. ([link to published version](#))

AWARDS

- Prix Dodu - Journées SMAI MODE 2024
- Best poster award - LACIAM 2023 (Latin American Congress on Applied and Industrial Mathematics)
- Bourse Sophie Saint German 2020 - FMJH (Fondation des Mathématiques Jacques Hadamard)

TALKS AND RESEARCH PRESENTATIONS

1. Contributed talk at Journées SMAI-MODE March 2024 (**Awarded Prix Dodu**)
2. PhD seminar CEREMADE, March 2024
3. Seminar Groupe de Travail OT-EDP-ML at LMO, December 2023
4. Seminar University of Freiburg, Germany, November 2023
5. Talk and published paper at Conference GSI' 23 (Geometric Science of Information), August 2023 at Saint-Malo
6. Contributed Talk at Conference "Calculus of Variations in Paris", June 2023
7. Poster Presentation at LACIAM 2023 (Latin American Congress of Industrial and Applied Mathematics), January 2023 (**Best Poster Award**)
8. PhD seminar CEREMADE, December 2021

TEACHING EXPERIENCE

During my thesis and my studies in Brazil, I have participated in various teaching activities. Here is a summary of my teaching experience

- Chargé de TDs (L2 et L3) Université Paris-Dauphine:
 1. 2024: Chargé de TD et TP pour les cours "Méthodes numériques algèbre matricielle" et "Analyse Fonctionnelle"
 2. 2023 Chargé de TD et TP pour les cours "Méthodes numériques: algèbre matricielle" et "Méthodes numériques: optimisation"
 3. 2022 Chargé de TD et TP pour le cours "Méthodes numériques: optimisation"
- From 2017-2020 I was teaching assistant in various courses at EMAP, the school of applied mathematics from FGV-Rio. I assisted in numerous courses including:
 - Functional Analysis (PhD program 2020),

- Measure Theory (PhD program 2020),
- Stochastic Process (Undergraduate program 2019),
- Real Analysis (Master program 2019),
- Real Analysis (Undergraduate program 2019)

ORGANIZATION

1. Co-organizer of the “Mokameeting”, the monthly seminar of the MOKAPLAN team, from September 2023 to September 2024
2. Local organization committee of “Workshop in Optimal Control and Mean Field Games”, Rio de Janeiro, October 2019,

LANGUAGES

- English : fluent
- French : fluent
- Portuguese : mother language