

Charles Bertucci

Resumé

Born 18th of March 1993 in Marseille, France
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Education

- 2022 **Habilitation à diriger les recherches**, *Institut Polytechnique de Paris*, Palaiseau.
Title : Monotonicity in mean field games and dynamics of the spectrum of large random matrices
- 2016–2018 **Ph. D. in Applied Mathematics**, *Université Paris-Dauphine*, Paris.
Title : Contributions à la théorie des jeux à champ moyen ; Advisor : Pierre-Louis Lions ;
Defended on the 11th of December 2018
- 2015–2016 **Master 2**, *Université Pierre et Marie Curie*, Paris, *Mention Très bien*.
- 2012–2016 **Diplôme d'ingénieur**, *École Polytechnique*, Palaiseau.
- 2010–2012 **Classes préparatoires**, *Lycée Thiers*, Marseille.

Working experience

- 2022–present **Professeur chargé de cours à temps partiel (Part time professor)**, *École Polytechnique*, Palaiseau.
- 2020–2022 **Chargé d'enseignement à temps partiel (Part time assistant professor)**, *École Polytechnique*, Palaiseau.
- 2019–present **CNRS researcher**, *École Polytechnique*, Palaiseau.
- 2016–2019 **Doctoral position**, *Université Paris-Dauphine*, Paris.
With teaching duty of 64h per year
- 2016–2021 **Research missions**, Paris.
with Kayrros, Banque de France and Institut Louis Bachelier

Research interests

- Partial Differential Equations
- Optimization
- Game theory
- Probabilities
- Numerical methods
- Mean Field Games
- Systems of conservation laws

- Obstacle problems

Students' supervising

- Co-supervision (with Pierre-Louis Lions) of the thesis of Diego Alejandro Murillo Taborda which started September 2021.
- Supervision of three internships of 2nd year ENSTA students.

Scientific papers

- C. Bertucci: Optimal stopping in mean field games, an obstacle problem approach ; *Journal de Mathématiques Pures et Appliquées*; 2018 ; Volume 120 ; p 165-194.
- C. Bertucci: Fokker-Planck equations of jumping particles and mean field games of impulse control; *Annales de l'Institut Henri Poincaré C, Analyse non linéaire* (Vol. 37, No. 5, pp. 1211-1244).
- C. Bertucci, J.-M. Lasry and P.-L. Lions: Some remarks on mean field games; *Communications in Partial Differential Equations*, 2019, vol. 44, no 3, p. 205-227.
- C. Bertucci: A remark on Uzawa's algorithm and an application to mean field games systems; *ESAIM: Mathematical Modelling and Numerical Analysis*, 2020, vol. 54, no 3, p. 1053-1071.
- C. Bertucci, J.-M. Lasry and P.-L. Lions: Strategic advantages in mean field games with a major player, 2020, *Comptes Rendus. Mathématique*, 2020, vol. 358, no 2, p. 113-118.
- C. Bertucci, J.-M. Lasry and P.-L. Lions: Master equation for the finite state space planning problem. *Archive for Rational Mechanics and Analysis*, 2021, p. 1-16.
- Y. Achdou, C. Bertucci, J.-M. Lasry, P.-L. Lions, A. Rostand and J. Scheinkman: A class of short-term models for the oil industry addressing speculative storage. *arXiv preprint arXiv:2003.11790*, 2020.
- C. Bertucci, L. Bertucci, J.-M. Lasry and P.-L. Lions: Mean Field Game Approach to Bitcoin Mining. *arXiv preprint arXiv:2004.08167*, 2020.
- C. Bertucci: Monotone solutions for mean field games master equations: finite state space and optimal stopping. *Journal de l'École polytechnique–Mathématiques*, 2021, vol. 8, p. 1099-1132.
- C. Bertucci : Monotone solutions for mean field games master equations: continuous state space and common noise. *arXiv preprint arXiv:2107.09531*, 2021.
- C. Bertucci, M. Debbah, J.-M. Lasry and P.-L. Lions: A Spectral Dominance Approach to Large Random Matrices. *arXiv preprint arXiv:2105.08983*, 2021.
- C. Bertucci, L. Bertucci, J.-M. Lasry and P.-L. Lions: Economic Modelling of the Bitcoin Mining Industry. Available at SSRN 3907822, 2021.
- C. Bertucci : Mean field games with incomplete information: HAL: 03666652, 2022.
- C. Bertucci and Alekos Cecchin : Mean field games master equations: from discrete to continuous state space, available at charles-bertucci.github.io, 2022.
- C. Bertucci, J.-M. Lasry and P.-L. Lions: A singular infinite dimensional Hamilton-Jacobi-Bellman equation arising from a storage problem, *arXiv:2210.02780*, 2022.

Conference papers

- C. Bertucci, S. Vassilaras, J.-M. Lasry, G. Paschos, M. Debbah and P.-L. Lions : Transmit strategies for massive machine-type communications based on mean field games ; *Proceedings of the International Symposium on Wireless Communication System (ISWCS)* ; 2018

Visits

Fall 2021 **University of Chicago**, *Invited by P. Souganidis (If possible due to covid...)*.

- June 2019 **Università di Roma la Sapienza**, *Invited by Fabio Camilli.*
- October 2017 **Università di Roma la Sapienza**, *Invited by Italo Capuzzo-Dolcetta.*
- March-July 2015 **Columbia Univeristy**, *Internship supervised by Guillaume Bal*, Title : Polynomial chaos expansions and optimal transport.

Selected Talks

- Avril 2022 **Workshop on Mean Field Games**, CRM, Montreal.
- Mars 2022 **Séminaire Laurent Schwartz**, IHES, Bures-sur-Yvette.
- Fev. 2022 **Séminaire Parisien d'Optimisation**, IHP, Paris.
- Jan. 2022 **Séminaire Parisien de théorie des jeux**, IHP, Paris.
- Dec. 2021 **Mathematical advances in Mean Field Games**, University of Chicago, Chicago.
- Nov. 2021 **Schrödinger Problem and MF PDE Systems...**, CIRM, Marseille.
- March 2021 **Séminaire du Laboratoire Jacques-Louis Lions**, Sorbonne Université.
- Feb. 2020 **Mean Field Games : Recent Progress**, University of Chicago, Chicago.
- Sept. 2019 **MFG and related topics 5**, Levico Terme, Trento (Italy).
- April 2019 **Workshop Mean field games and applications**, ICMS, Edimburgh.
- March 2019 **MAD-Stat Seminar**, TSE, Toulouse.
- March 2019 **Séminaire du CMAP**, École Polytechnique, Palaiseau.
- Jan. 2019 **Séminaire parisien de théorie des jeux**, IHP, Paris.
- Dec. 2018 **Seminar of the statistical department**, LSE, London.
- Oct. 2018 **Séminaire Probabilités statistiques et contrôle**, CMAP-ENSAE-ENSTA, Palaiseau.
- March 2018 **Workshop of the Mean field games ANR project**, Tours.
- Nov. 2017 **PGMO days**, EDF labs, Saclay.
- Oct. 2017 **Meeting of the "Groupe de recherche en théorie des jeux"**, Fréjus.
- Oct. 2017 **Seminario di Analisi Matematica**, Università di Roma la Sapienza, Roma.
- Sept. 2017 **Groupe de travail CaVa**, Uniservité Paris-sud, Orsay.
- June 2017 **8ème Biennale de la SMAI**, Ronce-les-Bains.
- Jan. 2017 **Séminaire de Mathématiques appliquées**, Collège de France, Paris.
- Nov. 2016 **PDE models for multi-agent phenomena**, Indam, Roma.
- Nov. 2016 **PGMO days**, EDF labs, Saclay.

Others

Cours Peccot 2022-2023; PGMO thesis prize in 2019; 1st prize for a thesis in mathematics from Chancellerie des Universités de Paris in 2019; Thesis prize from Fondation Dauphine in 2019.