

César Barilla

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Education

- 2019–2024 **Columbia University, New York,**
(expected) Economics PhD.
- 2019 **Paris School of Economics, Paris,**
Masters APE (Analysis and Economic Policy).
Summa Cum Laude
- 2018 **Université Paris 6 (Pierre et Marie Curie – Jussieu), Paris,**
MSc in Mathematics, specialized in Mathematics for Modeling.
Magna cum laude
- 2016 **Université Paris Dauphine, Paris,**
B.A. in Economics.
Magna cum laude
- 2015–2019 **École Normale Supérieure, Paris,**
Élève fonctionnaire stagiaire (Student civil servant, 4 years full scholarship).
- 2012–2015 **Lycée Henri IV, Paris,**
Classe Préparatoire B/L in Humanities and Social Sciences.

Working papers

- 2020 **A Mean-Field Game Model for Cities** (joint with Guillaume Carlier and Jean-Michel Lasry)
Abstract : We propose a (toy) MFG model for the evolution of residents and firms densities, coupled both by labour market equilibrium conditions at each time and competition for land use (congestion). This results in a system of two Hamilton-Jacobi-Bellman and two Fokker-Planck equations with a new form of coupling related to optimal transport. This MFG has a convex potential which enables us to find weak solutions by a variational approach. In the case of quadratic Hamiltonians, the problem can be reformulated in Lagrangian terms and solved numerically by an IPFP/Sinkhorn-like scheme. We present numerical results based on this approach, these simulations exhibit different behaviours with either residential or business centers depending on the initial conditions and parameters.

Research experience

- 2019 **Masters Thesis in Economics, Paris School of Economics,**
under the supervision of Alfred Galichon (NYU).
Subject : Many to one matching problem under complementarities with two-sided heterogeneity and applications to the labour market.
- 2018 **Research Internship/Masters Thesis in Mathematics,**
Université Paris-Dauphine and INRIA Paris, 6 months,
under the joint supervision of Guillaume Carlier and Jean-Michel Lasry.
Subject : Optimal transport coupling in multi-populations mean-field games, dynamic matching equilibrium with externalities and applications to urban planning.

- 2016 **Research Assistantship/Internship in Economics**,
Observatoire Français des Conjonctures Économiques (OFCE), 3 months,
 under the supervision of Jérôme Creel (director of the Dpt. of Studies).
 Subject : Theoretical modeling of financial instability, building on empirical work
 by Creel, Hubert, Labondance (2015).
- 2016 **Student research project in Econometrics**,
 Subject : Empirical study of savings behaviour with idiosyncratic effects of social
 status and unexpected budget rise, using self-collected data on ENS students.

Relevant Graduate Level Coursework

Advanced Field courses in Economics (PSE M2 Courses) :

- Network Economics (Demange, Bloch, Comola) ;
- Behavioral Economics and bounds on rationality (Jehiel, Compte) ;
- Information, Design and Markets (Lamy, Tercieux) ;
- Business cycles and stabilization policies (Hairault, Ferriere) ;
- Advanced Decision Theory (Tallon) ;
- The Theory of Incentives (Martimort) ;
- Collective Choice and Democracy (Laslier) ;
- Social Interactions (Verdier) ;
- From Statistical Physics to Social Sciences (Bouchaud).

Advanced Field courses in Mathematics (Paris 6 M2 Courses) :

- Optimal Transport and Calculus of Variations (Carlier) ;
- Mean-Field Games (Cardaliaguet) ;
- Continuous Optimization (Chambolle) ;
- Optimal Control in Finite and Infinite Dimension (Trélat) ;
- Stochastic Control (Pham) ;
- Statistics and Learning (Biau) ;
- Optimization (Lamboley) ;
- Partial Differential Equations (Béthuel) ;
- Functional Analysis (Cordero-Erausquin) ;
- Stochastic Calculus (Shi).

Advanced General courses in Economics (PSE M1 Courses) :

- Microeconomics sequence (Geoffard, Gagnepain, Bloch, Caillaud) ;
- Macroeconomics sequence (Hairault, Saint-Paul, Cohen, D'Autume) ;
- Econometrics Sequence (Jacquemet, Fack, Ben Salem, Doz, Behaghel) ;
- International Economics (Verdier, Imbs) ;
- Economic History (Piketty) ;
- Economic Policy (Benassy-Quéré).

Numerical and software skills

Matlab ; Python ; Freefem++ ; Stata ; SAS ; L^AT_EX.

Languages

French	Native	English	Fluent
Spanish	Fair	Italian	Fair
Russian	Beginner	German	Beginner

Other professional experiences

- 2016–2019 **Colleur (Interrogator) in Classe Préparatoire**, in *Mathematics*,
CPGE ECE (Business and Economics), Lycée Carnot (Paris), for prof. J. Bureaux.
- 2013–2019 **Private Lessons**, in *Economics, Mathematics and English*,
 Frequent teaching of private lessons at University or High School level.
- 2012–2014 **Part time tour guide**,
Museum of the Paris sewers.

2009 **Short internship,**
Universal Music France, Paris.

Other activities

Music Long-standing musical experience and practice, frequent concerts in semi-professional contexts, professional studio and home studio recordings, arrangement, composition, band-leading

Instruments Bass, Clarinet, Guitar, Tenor Saxophone, Keys.

Chiara & César Trio (2016-) Bass/guitar/clarinet/vocals and band leader, frequent concerts, composition of original songs, recording ;

Caravan quartet (2018-2019) Bass, private concerts for galas or cocktails, organisation of jam sessions ;

Enswing Big Band (2017-2019) Bass (initially saxophone/clarinet), arrangement, administrative and logistic responsibilities ;

Fanfare (brass band) of the ENS (2015–2017) Saxophone/clarinet, Musical and administrative direction ;

Courses in music theory Department of Music Theory of the ENS (harmony and writing, "music and poetry", german romanticism) ;

Side projects or former projects Band projects (rock, pop, folk, jazz), choir singing.

Photography Digital and 35mm film.

Graphic Design Creation of logos, posters and other formats. Conception and edition using Adobe Photoshop or Quark XPress.

Sports Squash, Tennis, Kendo, Iaido.