

ELENA
BANDINI

CURRICULUM
VITAE

Università degli Studi
di Milano-Bicocca
Dipartimento di Matematica
e Applicazioni
Via Roberto Cozzi, 55
20125 Milano, Italy
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PERSONAL INFORMATION

Born in Ponte dell'Olio (PC), Italy, on October 24th, 1988

Citizenship Italian

Address Strada Fontane, 6 - 43010, Fontevivo (PR), Italy

Tax code BNDLNE88R64G842J

EDUCATION

November 2017–Present **Assistant professor** at Dipartimento di Matematica e Applicazioni, *Università degli Studi Milano-Bicocca, Milano*.

January 2016– **Post-doc** at Dipartimento di Economia e Finanza, *LUISS Guido Carli, Roma*.

October 2017

2013–2015 **PhD cum laude in Mathematical Models and Methods in Engineering** at *Politecnico di Milano* and *ENSTA ParisTech - École Nationale Supérieure de Techniques Avancées*.

THESIS

Title: *Probabilistic Representation of HJB Equations for Optimal Control of Jump Processes, BSDEs and Related Stochastic Calculus*.

Advisors: Prof. Marco Fuhrman (Politecnico di Milano) and Prof. Francesco Russo (ENSTA ParisTech).

2010–2012 **Master of Science in Mathematical Engineering**. *Politecnico di Milano*, final grade: 110/110.

THESIS

Title: *Backward stochastic differential equations and optimal control of marked point processes*.

Advisor: Prof. Marco Fuhrman.

- March 2012 **Athens Program** at *Katholieke Universiteit Leuven - Belgium*. Title of the course: *Numerical programming with C++*.
- September 2011–
January 2012 **Graduate Exchange Program** at *Université Pierre et Marie Curie - Paris 6*.
- March 2011 **Athens Program** at *École des Mines - Paris*. Title of the course: *MonteCarlo methods*.
- 2007–2010 **Bachelor of Science in Mathematical Engineering**. *Politecnico di Milano*, final grade: 108/110.
- THESIS
Title: *The Lévy-Ciesielski construction of Wiener process*.
Advisor: Prof. Marco Fuhrman.
- 2002–2007 **Scientific high school diploma**. *Liceo Scientifico “G. Marconi”, Parma* final grade: 100/100.

RESEARCH INTERESTS

- Stochastic control and stochastic analysis
- Stochastic calculus for discontinuous processes and random measures
- Backward stochastic differential equations
- Hamilton-Jacobi-Bellman equations
- Mathematical Finance

VISITING POSITIONS

- November 20 - **Université Pierre et Marie Curie, Paris**, Prof. Michèle Thieullen.
- 25, 2017
- May 29 - **Université Pierre et Marie Curie, Paris**, Prof. Michèle Thieullen.
Juin 2, 2017
- December 5 - **Université Pierre et Marie Curie, Paris**, Prof. Michèle Thieullen.
11, 2016
- March 15 - **ENSTA ParisTech, École Nationale Supérieure de
Techniques Avancées**, Prof. Francesco Russo.
July 15, 2015
- October 15 - **ENSTA ParisTech, École Nationale Supérieure de
Techniques Avancées**, Prof. Francesco Russo.
December 15, 2014

RESEARCH PROJECTS

- 2018: In charge of the **research project** “*Controllo ottimo stocastico con osservazione parziale: metodo di randomizzazione ed equazioni di Hamilton-Jacobi-Bellman sullo spazio di Wasserstein*” supported by GNAMPA - Gruppo Nazionale per l’Analisi Matematica e la Probabilità.
- 2017: Member of the **research project** “*Nuovi metodi probabilistici nello studio di problemi di controllo ottimo stocastico*” supported by GNAMPA - Gruppo Nazionale per l’Analisi Matematica e la Probabilità. Head: A. Cosso.
- 2015-2016: Member of the Politecnico di Milano unit (responsible M. Fuhrman) of the **PRIN project** “*Deterministic and stochastic evolution equations*”. Head of the national project: A. Lunardi, Università di Parma (Italy).
- 2015: Member of the **research project** “*Applicazioni innovative di processi di punto marcato*” supported by GNAMPA - Gruppo Nazionale per l’Analisi Matematica e la Probabilità. Head: F. Confortola.
- 2013: Member of the **research project** “*Controllo ottimo di processi di punto e controllo impulsivo: il metodo delle equazioni retrograde con salti*” supported by GNAMPA - Gruppo Nazionale per l’Analisi Matematica e la Probabilità. Head: F. Confortola.
- 2010-2011: Member of the Politecnico di Milano unit (responsible M. Fuhrman) of the **PRIN project** “*Problemi differenziali di evoluzione: approcci deterministici e stocastici e loro interazioni*”. Head of the national project: M. Fuhrman, Politecnico di Milano (Italy).

TALKS

- April 22, 2018 *Shanghai Jiao Tong University*, Invited talk, *The Fourth Young Researchers Meeting on BSDEs, Nonlinear Expectations and Mathematical Finance*, "Constrained BSDEs driven by a non quasi-left-continuous and optimal control of Piecewise Deterministic Markov Processes".
- April 19, 2018 *Politecnico di Milano*, Invited talk, *Conversazione con Maria Gaetana Agnesi: Donna, matematica, milanese*, "La società e le donne scienziate oggi".
- July 4, 2017 *University of Edinburgh*, Contributed talk, *Workshop on BSDEs and SPDEs, Edinburgh*, "Existence and uniqueness for BSDEs driven by a general random measure, possibly non quasi-left-continuous. Application to the optimal control of Piecewise Deterministic Markov Processes".

- June 21, 2017, *Politecnico di Torino*, Contributed talk, *First Italian Meeting on Probability and Mathematical Statistics*, "Well-posedness results for BSDEs driven by a general random measure, possibly non quasi-left-continuous".
- December 8, 2016, *Université Paris Diderot*, Invited seminar, "Well-posedness results for BSDEs driven by a general random measure, possibly non quasi-left-continuous. Application to the optimal control of Piecewise Deterministic Markov Processes".
- June 1, 2016, *Levico Terme*, Invited short seminar, *Stochastic Partial Differential Equations and Applications - X*, "Existence and uniqueness for BSDEs driven by a general random measure, possibly non quasi-left-continuous".
- May 17, 2016, *Dipartimento di Matematica, Università di Parma*, Invited seminar, "Nonlinear Feynman-Kac representation for fully nonlinear Hamilton-Jacobi-Bellman integro-differential equations".
- March 15, 2016, *Dipartimento di Economia, Università di Parma*, Invited seminar, "Randomization method and backward SDEs for optimal control of partially observed path-dependent stochastic systems".
- October 21, 2015, *Dipartimento di Matematica, Università di Padova*, Invited seminar, "Optimal control of non-diffusive stochastic processes: constrained BSDE representation of the value function".
- June 15, 2015, *ENSTA ParisTech*, Invited seminar, "Optimal control of non-diffusive stochastic processes: constrained BSDE representation of the value function".
- May 14, 2015, *Technische Universität Wien*, Contributed talk, *13th Viennese Workshop on Optimal Control and Dynamic Games*, "Optimal control of pure jump Markov processes and constrained BSDEs with nonpositive jumps".
- February 10, 2015, *Siem Reap, Cambogia*, Contributed talk, *Paris-Southeast Asia Conference in Mathematical Finance*, "Optimal control of Piecewise Deterministic Markov Processes: constrained BSDE representation of the value function".
- February 4, 2015, *National University of Singapore*, Contributed talk, *NUS-Paris Diderot Workshop on Quantitative Finance*, "Optimal control of pure jump Markov processes and constrained BSDEs with nonpositive jumps".
- November 24, 2014, *ENSTA ParisTech*, Invited seminar, "Optimal control of pure jump Markov processes and constrained backward stochastic differential equations".

November 20, *Dipartimento di Matematica, Politecnico di Milano*,
2013 *Invited seminar*, "Optimal control of semi-Markov processes
with a backward stochastic differential equations approach".

TEACHING EXPERIENCE

March 2018 - PROFESSOR IN CHARGE of **Algebra Lineare**, Bachelor De-
June 2018 gree in Statistics, Università degli Studi di Milano-Bicocca.

March 2018 - TEACHING ASSISTANT in **Matematica II**, Bachelor Degree
June 2018 in Chemistry, Università degli Studi di Milano-Bicocca.

January 2017 PROFESSOR IN CHARGE of **Portfolio Optimization**, Mas-
- March 2017 ter Degree in Economics and Finance, Università Statale di
Milano.

September TEACHING ASSISTANT in **Mathematical Methods for Eco-**
2016 - **nomics and Finance**, Master Degree in Economics and
December Finance, Università LUISS Guido Carli.
2016

January 2016 PROFESSOR IN CHARGE of **Portfolio Optimization**, Mas-
- March 2016 ter Degree in Economics and Finance, Università Statale di
Milano.

September TEACHING ASSISTANT in **Statistics and Probability**, Bach-
2014 - elor Degree in Informatics Engineering, Politecnico di Milano.
January 2015

March 2014 - TEACHING ASSISTANT in **Stochastic Optimal Control**,
June 2014 Master Degree in Mathematical Engineering, Politecnico di
Milano.

March 2014 - TEACHING ASSISTANT in **Statistics and Probability**, Bach-
June 2014 elor Degree in Industrial Engineering, Politecnico di Milano.

March 2014 - TUTOR for **Probability**, Bachelor Degree in Mathematical
June 2014 Engineering, Politecnico di Milano.

September TEACHING ASSISTANT in **Statistics and Probability**, Bach-
2013 - elor Degree in Informatics Engineering, Politecnico di Milano.
January 2014

March 2013 - TUTOR for **Probability**, Bachelor Degree in Mathematical
June 2013 Engineering, Politecnico di Milano.

REFeree ACTIVITY

Electronic Journal of Probability; Stochastics; SIAM Journal on Control and
Optimization; Applied Mathematics and Optimization.

PUBLISHED AND ACCEPTED PAPERS

- [1] E. BANDINI, *Existence and uniqueness for backward stochastic differential equations driven by a possibly non quasi-left continuous random measure*, **Electronic Communications in Probability**, 20(71), 1–13, 2015.
- [2] E. BANDINI, F. CONFORTOLA, *Optimal control of semi-Markov processes with a backward stochastic differential equations approach*, **Mathematics of Control, Signals, and Systems**, 29(1), 1-35, 2017.
- [3] E. BANDINI, M. FUHRMAN, *Constrained BSDEs representation of the value function in optimal control of pure jump Markov processes*, **Stochastic Processes and their Applications**, 127(5), 1441–1474, 2017.
- [4] E. BANDINI, F. RUSSO, *Weak Dirichlet processes with jumps*. **Stochastic Processes and their Applications**, 127(12): 4139-4189, 2017.
- [5] E. BANDINI, F. RUSSO, *Special weak Dirichlet processes and BSDEs driven by a random measure*, **Bernoulli** 24(4A): 2569-2609, 2018.
- [6] E. BANDINI, *Optimal control of Piecewise-Deterministic Markov Processes: a Backward SDE representation of the value function*. To appear in **ESAIM: Control, Optimization and Calculus of Variations**, 2018.
- [7] E. BANDINI, A. COSSO, M. FUHRMAN, H. PHAM, *Randomization method and backward SDEs for optimal control of partially observed path-dependent stochastic systems*. To appear in **Annals of Applied Probability**, 2018.
- [8] E. BANDINI, A. COSSO, M. FUHRMAN, H. PHAM, *Randomized filtering and Bellman equation in Wasserstein space for partial observation control problem*. To appear in **Stochastic Processes and their Applications**, 2018.

PAPERS UNDER REVIEW

- [9] E. BANDINI, *Constrained BSDEs driven by a non quasi-left-continuous random measure and optimal control of PDMPs on bounded domains*. Preprint arXiv:1712.05205.

WORKING PAPERS

E. BANDINI, T. DE ANGELIS, G. FERRARI, F. GOZZI, *The dividend problem with stochastic interest rates*.

E. BANDINI, F. GOZZI, *Bilinear SDE in Hilbert spaces: Kolmogorov equation and Bismut-Elworthy formula*.

E. BANDINI, F. CONFORTOLA, A. COSSO *Feynman-Kac Representation for Hamilton-Jacobi-Bellman Equations in Hilbert Spaces.*

E. BANDINI, M. THIEULLEN, *Optimal control of infinite dimensional Piecewise Deterministic Markov Processes: a BSDE representation for the value function.*

Le dichiarazioni rese nel presente curriculum sono da ritenersi rilasciate ai sensi degli art. 46 e 47 del D.P.R. 445/2000.