# Fulvia Confortola's Curriculum Vitae


- Fulvia Confortola

  *Associate Professor*, Department of Mathematics, Politecnico di Milano

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- Personal Data

  *Date and place of birth:* July 14, 1975; Busto Arsizio Italy.

  *Citizenship:* Italian

  *Phone:* +39 02 23994614

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- Education:
  - Laurea in Mathematics, 6th November 2000, Department of Mathematics, University of Milan
  - PhD Degree in Mathematics, 2th February 2005, Department of Mathematics, University of Milan.

- Position:
  - *March 2005 - March 2006*: Research contract at the Department of Mathematics, Politecnico di Milano
  - *May 2006 - December 2006*: Research contract at the Department of Mathematics, University of Trento.
  - *January 2007 - April 2008*: Research contract at the Department of Mathematics, University Milano-Bicocca.
  - *May 2008 - March 2018*: Assistant Professor at the Department of Mathematics, Politecnico di Milano.
  - *April 2018 - present*: Associate Professor at the Department of Mathematics, Politecnico di Milano.

- Research interests

  She is the author of papers published on international journals. She deals with "backward" stochastic differential equations in Hilbert spaces of infinite dimensions. She has studied equations with monotone generators linear and quadratic. She has investigated connections with partial differential equations on abstract spaces and applications to optimal control problems for stochastic partial differential equations (SPDEs). In particular she has considered optimal control problems for neuronal networks and for Volterra equations. She studied also filtering and control with partial observation in the case where the observation process is not directly affected by noise. Her recent field of research is related to backward stochastic differential equations and optimal control problem of marked point process in markovian and non-markovian framework.

- Partecipation at research project
  - 2001-2004. "Progetto Giovani Ricercatori 2000" (Nota Ministeriale N.1707 del 22/07/1998-Prot.Univ. di Milano S/03410 del 10.03.1999). Role: Coordinator.
  - 2002-2004, 2004-2006, 2006-2008. MIUR-PRIN "Kolmogorov's equations" project (a research project of the Italian Ministry for University). National coordinator prof. Giuseppe da Prato (Scuola Normale superiore di Pisa). Role: Participant.

- 2005. Gnampa Research project 2005 ”Backward stochastic differential equations and applications”. Coordinator Prof. M. Fuhrman. Role: Participant.
- 2002-2006 European Union projects (Training and Mobility Researchers HPRN-CT-2002-00281) “Evolution Equations for deterministic and stochastic systems”, Coordinator Marc Quincampoix, Université de Brest (France). Role: participant. (HPRN-CT-2002-00281).
- Since 2002, member of the INDAM-GNAMPA (Gruppo Nazionale Analisi Matematica, Probabilit e Applicazioni).
- 2008-2010. PRIN 2008:“Metodi deterministici e stocastici nello studio di problemi di evoluzione”. Local Coordinator: Prof. M. Fuhrman. National Coordinator: Prof. A. Lunardi. Role: Participant.
- 2008-2012. Marie Curie Initial Training Network (ITN) Call: FP7-PEOPLE-2007-1-1-ITN, no. 213841-2 “Deterministic and Stochastic Controlled Systems and Applications”, Coordinator Prof. Aurel Rascanu, Scientific coordinator Prof. Rainer Buckdahn. Role: Participant.
- 2010. Gnampa Research project 2010: “Equazioni differenziali stocastiche con memoria”. Role: Coordinator.
- 2011. Gnampa Research project 2011: “Equazioni di evoluzione con memoria e controlla ottimo: un approccio deterministico e stocastico”. Coordinator: E.M. Marchini; Role: Participant.
- 2012. Gnampa Research project 2012 “Analisi e controllo per sistemi con memoria”. Role: Coordinator.
- 2013. Gnampa Research project 2013 “Controllo ottimo di processi di punto e controllo impulsivo: il metodo delle equazioni retrograde con salti”. Role: Coordinator.
- 2015. Gnampa Research project 2015 “Applicazioni innovative dei processi di punto marcato”. Role: Coordinator.
- 2016. Gnampa Research project 2016 “Problemi di controllo ottimo stocastica con osservazione parziale e processi di punto marcato”. Role: Coordinator.
- 2013 - 2016. PRIN-MIUR 2010-2011 “Problemi differenziali di evoluzione: approcci deterministici e stocastici e loro interazioni,” National and Coordinator Prof. Marco Fuhrman, (Politecnico di Milano). Role: Participant.
- 2017. Gnampa Research project 2017 “Nuovi metodi probabilistici nello studio di problemi di controllo ottimo stocastico.”. Coordinator: A. Cosso; Role: Participant.
- 2017 - 2020. PRIN-MIUR 2015 “Deterministic and stochastic evolution equations”, National Coordinator Prof. Alessandra Lunardi. Role: Participant.
- 2019. Gnampa Research project 2019 “Problemi di controllo ottimo stocastico con osservazione parziale in dimensione infinita”. Coordinator: A. Calvia; Role: Participant.

- Invited professional visits
  - June-July 2005, 2006, 2007 Université de Rennes 1, France;
  - June 2008, Université de Rennes 1, France;
  - June-July 2009, Université de Savoie-Chambéry, France;
  - July 2010, Università di Trento, Italy;
  - April 2011, Université de Savoie-Chambéry, France;
  - September 2012, Università di Trento,
  - December 2016, Università di Trento.
  - November 2017, Oxford University.

- Conference Talks
  - “Backward stochastic differential equations: the dissipative case”, Università degli studi di Parma, 28 Gennaio 2003.

- "Dissipative Backward stochastic differential equations in infinite dimensions", TMR Workshop in Brest, France, "Evolution Equations for Deterministic and Stochastic systems", 2003.
- "Dissipative backward stochastic differential equations with locally Lipschitz nonlinearity", TMR "Evolution Equations for Deterministic and Stochastic systems", Pisa, 2005.
- "Dissipative backward stochastic differential equations with locally Lipschitz nonlinearity", Department of Mathematics, Universié de Rennes 1, France, Luglio 2006.
- "Differentiability of Backward stochastic differential equations in Hilbert spaces with monotone generators", Workshop "Stochastic equations and related Topics", Jena, 2006.
- "An analytical approach to stochastic Volterra equations with completely monotone kernel" , 3 luglio 2009, Lama, Université de Savoie-Chambéry, France.
- "BMO martingales and Backward Stochastic Differential Equations", Workshop "Equazioni di Kolmogorov", University of Parma, 2006.
- "Quadratic BSDEs with random terminal time and elliptic PDEs in infinite dimension", Workshop "First CIRM-HCM Joint Meeting: Stochastic Analysis, SPDEs, Particle Systems, Optimal Transport", Levico Terme, Trento, 2010.
- "Optimal control for stochastic Volterra equations with completely monotone kernels" Ottava Giornata di Studio Università di Pavia - Politecnico di Milano 15 dicembre 2010, Dipartimento di Matematica Politecnico di Milano
- "Quadratic BSDEs with random terminal time and optimal control problem", The 6th International Symposium on Backward SDEs and Applications, University of Southern California, Los Angeles, 8-10 June 2011.
- "Backward stochastic differential equation driven by a marked point process: an elementary approach with an application to optimal control". Convegno "Stochastic Partial Differential Equations and Applications - X", Levico Terme, Trento, 29/5-4/6/2016.
- "Backward stochastic differential equation driven by a marked point process: an elementary approach with an application to optimal control". Convegno Gnampa 2016 - Montecatini, 20-23 giugno 2016.
- "Backward stochastic differential equation and point processes". International Workshop on BSDEs, SPDEs and their Applications Edinburgh, July 3-7, 2017.
- "BSDEs and optimal control of point processes". Workshop on Stochastic control, BSDEs and new developments, Roscoff (Francia), September 11-15, 2017
- "Optimal control of point processes with a Backward Stochastic Differential Equations approach", November 16, 2017, Mathematical Institute, Oxford University.
- "Optimal control for stochastic Volterra equations driven by Lévy noise", 14th Viennese Conference on Optimal Control and Dynamic Games, Vienna - July 3-6, 2018.
- "Optimal control of stochastic processes with jumps with a BSDEs approach", Second Italian Meeting in Probability and Statistics, Vietri - June 17-20, 2019.

- Partecipation at conference
  - Workshop "Quantum Probability and Infinite Dimensional Analysis", Politecnico di Milano, 2002.
  - Mini-Workshop "Approcci probabilistici alle equazioni paraboliche non lineari", Department of Mathematics University of Parma, 2003.
  - TMR Workshop "Evolution Equations for Deterministic and Stochastic system", Roscoff, France, 2003.
  - Minicourse-Workshop "Interplay between (C0)-semigroups and PDEs: theory and application", Department of Mathematics University of Bari, 2003.
  - Workshop "Two Days on Kolmogorov equations", Scuola Normale superiore, Pisa, 2003.

- "Conference on Stochastic Partial Differential Equations and Applications VII" Levico Terme, Trento, 2004.
- TMR Workshop "Evolution Equations for Deterministic and Stochastic system", Delft, Holland 2004.
- Workshop "Incontro su equazioni di Kolmogorov", Department of Mathematics University Parma, 2004.
- TMR Workshop "Evolution Equations for Deterministic and Stochastic system", Pisa, Italia, 2005.
- Workshop "Stochastic equations and related Topics", Jena, Germany , 2006.
- Workshop "Equazioni di Kolmogorov", Parma, November 2006.
- "Conference on Stochastic Partial Differential Equations and Applications VIII" Levico Terme, Trento, 2008.
- "Sixth Seminar on Stochastic Analysis, Random Fields and Applications", Centro Stefano Franscini, Ascona, Svizzera , May 19-23 2008.
- "The fifht Colloquium on Backward Stochastic Differential Equations, Finance and Applications", Le Mans, France, June 18-20, 2008
- "First CIRM-HCM Joint Meeting: Stochastic Analysis, SPDEs, Particle Systems, Optimal Transport", Levico Terme, Trento, 2010.
- "New advances in Backward SDEs for financial engineering applications", Tamerza, Tunisia, October 25-28 2010,
- "Ottava Giornata di Studio Universit di Pavia - Politecnico di Milano" Dicember 15, 2010, Dipartimento di Matematica Politecnico di Milano
- "The 6th International Symposium on Backward SDEs and Applications", University of Southern California, Los Angeles, June 8-10, 2011.
- Workshop on "Topics in stochastic control", Milan,July 11 - 13, 2011, Department of Mathematics, Politecnico di Milano.
- Workshop "Deterministic and stochastic methods in evolution problems", Università di Parma, September 7-9, 2011
- Workshop on "Recent Developments in Stochastic Analysis", June 4-8, 2012 - CIB/EPFL, Lousanne.
- "Sixth European Congress of Mathematics", July 2-9, 2012, Krakow.
- Workshop on "Evolution equations, deterministic and stochastic models and applications", Trento, November 26-27, 2012.
- Workshop on "Backward stochastic differential equations", Rennes, May 22-24, 2013.
- De Finetti Workshop, Università Statale di Milano, January 21, 2015.
- Workshop on "Path-dependent PDEs and stochastic equations with memory". Università Statale di Milano, January 23, 2015.
- Workshop "Optimal Stopping and Application", Università di Torino, May 22, 2015.
- "First italian meeting on probability and mathematical statistics", Politecnico di Torino, June 19-22, 2017.
- Winter School on "Stochastic PDEs and Mean-Field Games", Department of Mathematics, University of Bologna January 14-16, 2019.
- "Second Italian Meeting in Probability and Statistics", Vietri - June 17-20, 2019.

• Other activities

  – Student advising:

    N. Raimondi, "Attese sublineari e calcolo stocastico sotto incertezza", Master in Mathematical Engineering, Ingegneria Matematica.

- Referee for international journals:
  1. Journal of Applied Mathematics and Stochastic Analysis;
  2. Journal of Theoretical Probability
  3. Applied Mathematics and Computation
  4. Statistics and Probability Letters
  5. Mathematics of Control, Signals, and Systems.
  6. Stochastic Processes and their Applications.
  7. Journal of Dynamical and Control Systems.
  8. Journal of Optimization Theory and Applications.
  9. Stochastics: An International Journal of Probability And Stochastic Processes
  10. ESAIM: Control, Optimisation and Calculus of Variations.
  11. SIAM Journal on Control and Optimization
  12. International Journal of Control.
  13. Probability, Uncertainty and Quantitative Risk.
- Organizer of workshop and summer school:
  1. "Workshop on mathematical control theory", University Milano-Bicocca, Italy, 2007.
  2. Summer School "Stochastic control and related PDEs" 27 June - 8 July 2011, Department of Mathematics and Applications, University Milano Bicocca.
  3. "Workshop on Topics in stochastic control Milan", 11 - 13 July, 2011, Department of Mathematics, Politecnico di Milano.
  4. Contributed Section "Some topics on path-dependent stochastic equations", June 22, 2017, of the "Fisrt italian meeting on probability and mathematical statistics", Politecnico di Torino, June 19-22, 2017.

- Teaching activities
  - Assistant. First level course. Analisi Matematica, Faculty of Science, University of Milano, A.A. 2000-01;
  - Assistant. First level course. Elementi di Analisi Matematica e Geometria A e B- Politecnico di Milano, A.A. 2000-01, 2001-02, 2002-03;
  - Assistant. First level course. Calcolo delle Probabilità- Politecnico di Milano, A.A. 2002-03, 2004-05, 2005-06, 2006-07, 2009-10
  - Assistant. First level course. Calcolo delle Probabilità e Statistica Matematica B, A.A. 2003-04;
  - Assistant. First level course. Statistica Matematica A- Politecnico di Milano, A.A. 2003-04;
  - Assistant. Master level course. Equazioni Differenziali Stocastiche - Politecnico di Milano A.A. 2004-05, 2005-06, 2006-07, 2007-08, 2008-09, 2009-2010
  - Assistant. First level course. Metodi analitici e statistici per l'inegneria fisica - Politecnico di Milano A.A. 2009-2010
  - Assistant. First level course. Calcolo delle probabilità, Faculty of Science, University of Milano Bicocca, A.A. 2005-2006.
  - Lecturer. First level course. Calcolo delle Probabilità e Statistica Matematica - Politecnico di Milano A.A. 2010-2011, 2011-12
  - Lecturer. First level course. Statistica. Politecnico di Milano A.A. 2012-13, 2014-2015, 2015-2016, 2016-2017, 2017-2018, 2018-2019
  - Lecturer. First level course. Calcolo delle probabilità. Politecnico di Milano A.A. 2017-2018
  - Assistant. Master level course. Controllo Ottimo Stocastico - Politecnico di Milano A.A. 2012-2013, 2014-2015

- Assistant. Phd course. Probability, PhD School in Economy and Finance, Università Bocconi, A.A 2011-12, 2012-13
- Assistant. Phd course. EDP stocastiche, Scuola di Dottorato in Modelli e metodi matematici per l'Ingegneria, Dipartimento di Matematica, Politecnico di Milano, A.A. 2010-11
- Assistant. Phd course. Introduction to viscosity solutions for elliptic and parabolic PDE's, Summer School "Stochastic Control and Related PDEs", Università di Milano Bicocca, 26 Giugno- 8 Luglio 2011
- Lecturer. Phd course. Stochastic non linear filtering and control, Scuola di Dottorato in Modelli e metodi matematici per l'Ingegneria, Dipartimento di Matematica, Politecnico di Milano, A.A. 2014-15
- Assistant. Master level course. Stochastic dynamical models - Politecnico di Milano A.A. 2015-2016, 2016-2017
- Lecturer. Master level course. Stochastic Differential Equations - Politecnico di Milano A.A. 2018-19, 2019-20
- Lecturer. Phd course. An introduction to deterministic and stochastic control theory, Scuola di Dottorato in Modelli e metodi matematici per l'Ingegneria, Dipartimento di Matematica, Politecnico di Milano, A.A. 2018-19

- Pubblication

  - F. Confortola. (2006) **Dissipative backward stochastic differential equations in infinite dimensions** INFINITE DIMENSIONAL ANALYSIS QUANTUM PROBABILITY AND RELATED TOPICS, vol. 9; p. 155-168.
  - F. Confortola. (2007) **Dissipative backward stochastic differential equations with locally Lipschtiz nonlinearity.** STOCHASTIC PROCESSES AND THEIR APPLICATIONS. vol. 117, pp. 613-628.
  - Ph. Briand, F. Confortola. (2007). **Differentiability of backward stochastic differential equations in Hilbert spaces with monotone generators**. APPLIED MATHEMATICS AND OPTIMIZATION. vol. 57, pp. 149-176.
  - Ph. Briand, F. Confortola. (2007). **BSDEs with stochastic Lipschitz condition and quadratic PDEs in Hilbert spaces**. STOCHASTIC PROCESSES AND THEIR APPLICATIONS. vol. 118, pp. 818-838.
  - Ph. Briand, F. Confortola. (2008). **Quadratic BSDEs with random terminal time and elliptic PDEs in infinite dimension**. ELECTRONIC JOURNAL OF PROBABILITY. vol. 13, pp. 1529-1561.
  - S. Bonaccorsi, F. Confortola, E. Mastrogiacomo (2008). **Control of stochastic differential equations with dynamical boundary conditions**. JOURNAL OF MATHEMATICAL ANALYSIS AND APPLICATIONS. vol. 344, pp. 667-681.
  - S. Bonaccorsi, F. Confortola, E. Mastrogiacomo, (2012) **Optimal control for stochastic Volterra Equations with completely monotone kernels.** SIAM J. CONTROL OPTIM. Vol. 50, No. 2, pp. 748789.
  - F. Confortola, M. Fuhrman (2013) **Filtering of continuous-time Markov chains with noise-free observation and applications.** STOCHASTIC: AN INTERNATIONAL JOURNAL OF PROBABILITY AND STOCHASTIC PROCESSES, Vol. 85, No. 2, pp. 216-251.
  - F. Confortola, M. Fuhrman (2013) **Backward stochastic differential equations and optimal control of marked point processes** SIAM J. CONTROL OPTIM. Vol. 51, No. 5, pp. 3592-3623.
  - F. Confortola, M. Fuhrman (2014) **Backward stochastic differential equations associated to jump Markov processes and applications**. STOCHASTIC PROCESSES AND THEIR APPLICATIONS, 124 (1) , pp. 289-316.
  - F. Confortola, E. Mastrogiacomo (2014) **Optimal control for stochastic heat equation with memory** EVOLUTION EQUATIONS AND CONTROL THEORY, 3 (1), pp. 35-58.

- F. Confortola, E. Mastrogiacomo (2015) **Feedback optimal control for stochastic Volterra equations with completely monotone kernels**, MATHEMATICAL CONTROL AND RELATED FIELDS Vol. 5, No. 2, pp. 191-235
- F. Confortola, M. Fuhrman, J. Jacod. (2016) **Backward stochastic differential equation driven by a marked point process: An elementary approach with an application to optimal control** ANNALS OF APPLIED PROBABILITY. 26 (3) , pp. 1743-1773.
- E. Bandini, F. Confortola (2017) **Optimal control of semi-Markov processes with a backward stochastic differential equations approach**, MATH. CONTROL SIGNALS SYSTEMS 29, no. 1, art.1 pp.35.
- F. Confortola, M. Fuhrman, G. Guatteri, G. Tessitore (2018) **Linear-quadratic optimal control under non-Markovian switching**, Linear-quadratic optimal control under non-Markovian switching. STOCH. ANAL. APPL. 36 (2018), no. 1, pp.166180.
- Bandini, E., Confortola, F., Cosso, A. (2019) **BSDE representation and randomized dynamic programming principle for stochastic control problems of infinite-dimensional jump-diffusions.** ELECTRON. J. PROBAB. 24 , Paper No. 81, pp.37
- Confortola, F.; Cosso, A.; Fuhrman, M. (2019) **Backward SDEs and infinite horizon stochastic optimal control.** ESAIM Control Optim. Calc. Var. 25 (2019),
- F. Confortola (2019), $L^p$ **solution of BSDEs driven by a marked point process**, MATH. CONTROL SIGNALS SYSTEMS 31, no. 1, Art. 1, pp. 32

- Preprint
  - S. Bonaccorsi, F. Confortola, **Optimal control for stochastic Volterra equations with multiplicative Lévy noise**, submitted.

Milan 28/11/2019 Fulvia Confortola