

CURRICULUM VITAE DI PAOLO DAI PRA

Dati personali

Nato il 1 Novembre 1962 a Venezia. Cittadinanza: Italiana.

Affiliazione: Università di Verona, Dipartimento di Informatica

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Formazione

- Laurea in Matematica cum laude, Università di Padova (1986)
- Ph.D. in Mathematics, Rutgers University, Supervisore Prof. J.L. Lebowitz (1988-1992)

Carriera Accademica

- Professore ordinario di Calcolo delle Probabilità e Statistica Matematica, Università di Verona (2019-)
- Professore ordinario di Calcolo delle Probabilità e Statistica Matematica, Università di Padova (2000-2019)
- Professore associato di Calcolo delle Probabilità e Statistica Matematica, Politecnico di Milano (1998-2000)
- Ricercatore di Calcolo delle Probabilità e Statistica Matematica, Università di Padova (1992-1998)

Visiting Positions

- Université de Poitiers (2015, 1 mese)
- UST Lille (1998, 1 mese)
- Rutgers University (1996, 6 mesi)

Grants

- PRIN 2015 "Research Projects of National Interest", Italian Ministry of University. Project "Large scale random structures", responsible for the unit of Padova (2016-2019, 29100 Euros)
- Principal Investigators of the Grant 'New challenges in reciprocal processes, Schroedinger bridges, optimal transport and their respective geometries with applications to control engineering problems for classical and quantum systems', University of Padova (2015-16, 20742 Euros)
- PRIN "Research Projects of National Interest", Italian Ministry of University (2003-09, 115,000 Euros total)

Recenti interventi a congressi

- Invited speaker a "Stochastics Meeting Lunteren 2019".
- Invited speaker al Workshop "Phase Transitions and Particle Systems", Berlin, 2019.
- Invited speaker alla Conferenza "Population Dynamics and Statistical Physics in Synergy II", Pisa, 2019.
- Invited speaker al "Institutskolloquium", Institut für Mathematik, Universität Potsdam, 2018.
- Invited speaker alla serie di seminari "Kac Seminars", Utrecht, 2018.
- Invited speaker al "Workshop on Random Walks, Folding Transitions and related topics", Firenze 2017.
- Invited speaker al workshop "Self interacting processes", Melbourne 2017.
- Invited lecturer di un mini corso alla scuola CIRM "Stochastic Dynamics out of Equilibrium", Marseille-Paris 2017
- Invited speaker alla serie di seminari "Hypatie", Marseille 2015.

- Invited speaker al Convegno “Inhomogeneous random systems”, Paris 2014.
- Invited speaker al workshop “Probabilistic Cellular Automata”, Eindhoven 2013.
- Invited speaker al SIAM Annual Meeting, Minneapolis 2012.
- Invited speaker al workshop “Discrete harmonic analysis”, Cambridge 2011.
- Invited lecturer of a mini course alla Scuola Estiva “Stochastic Models of Complex Processes”, Potsdam 2007.

Organizzazione di attività scientifiche (recenti)

- Co-organizzatore del workshop “Random Polymers and Networks”, Porquerolles, 2020.
- Co-organizzatore del Second Italian Meeting on Probability and Mathematical Statistics, Vietri sul Mare, 2019.
- Organizzatore del workshop “Large Scale Random Structures”, Padova, 2018.
- Co-organizzatore del workshop “Stochastic models in ecology and evolutionary biology”, Venezia, 2018.
- Co-organizzatore del First Italian Meeting on Probability and Mathematical Statistics, Torino 2017.
- Co-organizzatore del Summer School RTG1845 Berlin-Potsdam “Stochastic Analysis with applications to Biology, Finance and Physics”, Levico Terme 2015
- Co-organizzatore del Congresso “Interacting Particle Systems”, Villa Finally, Firenze 2012
- Co-organizzatore del XII Workshop on quantitative finance, Padova 2011

Attività editoriali

Membro dei comitati editoriali

- Electronic Journal of Probability and Electronic Communications in Probability (2018-)
- Mathematics of Control, Signal and Systems (2003-2014)
- ISRN Probability and Statistics (2012-2014)
- La Matematica nella Società e nella Cultura (Journal of the Unione Matematica Italiana) (2007-2012)

Attività di referenzio

Annals of Probability, Annals of Applied Probability, Probability Theory and Related Fields, Annales de l'Institut Henri Poincaré, Journal of Statistical Physics, Stochastic Processes and their Applications.

Principali attività organizzative

- Presidente CCS Laurea Magistrale in “Data Science”, Università di Padova, 2019.
- Presidente Comitato Ordinatore Laurea Magistrale in “Data Science”, Università di Padova, 2017-2019.
- Presidente della Commissione Didattica dei Corsi di laurea in Matematica, Università di Padova, 2017-.
- Coordinatore della Scuola di Dottorato in Scienze Matematiche dell'Università di Padova, 2009-2014.
- Presidente della Commissione Risorse dell'Area Matematica nella Facoltà di Scienze MM FF NN, e rappresentante di Area nella Commissione Risorse e Programmazione della Facoltà di Scienze MM FF NN, 2003-2007.

Insegnamento

Nella mia carriera ho tenuto una grande varietà di insegnamenti, dalla probabilità di base ai processi stocastici, statistica matematica, analisi matematica e fisica matematica.

Questa è la lista dei miei insegnamenti degli ultimi 5 anni:

- 2019/20:
 - Statistical learning (LM Mathematics)
 - Sistemi stocastici (LT Matematica Applicata)
 - Probabilità (LT Matematica Applicata)
- 2018/19:
 - Stochastic methods (LM Data Science)
 - Probabilità e statistica (LT Matematica)
 - Analytic and stochastic mathematical methods for engineering (LM Mathematical Engineering)
- 2017/18:
 - Stochastic methods (LM Data Science)
 - Calcolo delle Probabilità (LM Scienze Statistiche)
 - Statistica Matematica (LT Matematica)
 - Basics in stochastic simulations (Ph.D. Mathematical Sciences)
- 2016/17
 - Istituzioni di Probabilità (LT Statistica per l'Economia e le Scienze)
 - Analisi Stocastica (LM Matematica)
- 2015/16
 - Istituzioni di Probabilità (LT Statistica per l'Economia e le Scienze)
 - Analisi Stocastica (LM Matematica)
 - Mean field models, propagation of chaos and applications (Ph.D. in Mathematical Sciences)
- 2014/15
 - Istituzioni di Probabilità (LT Statistica per l'Economia e le Scienze)
 - Calcolo delle Probabilità (LT Matematica)

Ex studenti di dottorato (con posizione accademica)

- Marco Formentin (Professore Associato, Università di Padova)
- Francesca Collet (Ricercatore, Università di Padova)
- Elena Sartori (Ricercatore, Università di Padova)
- Giovanni Conforti (Ricercatore, École Polytechnique, Paris)
- Pierre-Yves Louis (Professore Associato AgroSup Dijon)
- Ida Minelli (Ricercatore, University of L'Aquila)
- Marco Tolotti (Professore Associato, University of Venezia)

Interessi di ricerca

Sono stato co-autore di oltre 60 articoli apparsi su riviste internazionali, quali Ann. of Probability, Prob. Theory and Related Fields, Comm. Pure Appl. Math., J. Funct. Analysis, SIAM J. Control Optimiz., Ann. Inst. H. Poincaré, Stoch. Processes and Appl., Electron. J. Probab., J. of Statistical Physics.

La mia ricerca riguarda il Calcolo delle Probabilità e le sue applicazioni. I temi principali delle mie ricerche sono:

1. Sistemi complessi in biologia e scienze sociali.
2. Proprietà geometriche e di scala di processi stocastici.
3. Convergenza all'equilibrio e disuguaglianze funzionali per sistemi di particelle interagenti.

Alcuni dei miei risultati principali sono:

- Un principio di Grandi Deviazioni per sistemi disordinati a campo medio
- Un teorema di dualità che lega problemi di controllo stocastico e giochi dinamici
- La prima dimostrazione della scala diffusiva del gap spettrale in processi zero-range
- Una parziale estensione a processi di salto della teoria di Bakry-Emery per diffusioni
- Introduzione di dinamiche dissipative a campo medio, e dimostrazione del loro comportamento collettivo in casi speciali.

Dati Bibliometrici (04-09-2020)

Da Google Scholar:

- Citations 1333 (677 since 2015)
- h-index 20 (16 since 2015)
- i10-index 33 (23 since 2015)

From Scopus:

- N. papers last 10 years: 34
- N. citations last 15 years: 230
- h-index 15 years: 9

Articoli pubblicati

- 1) Dai Pra, P., Formentin, M., & Pelino, G. (2020). Oscillatory behavior in a model of non-Markovian mean field interacting spins. *Journal of Statistical Physics*, 179(3), 690-712.
- 2) Dai Pra, P., Sartori, E., Tolotti, M.
Climb on the bandwagon: consensus and periodicity in a lifetime utility model with strategic interactions.
(2019) *Dyn. Games Appl.* 9, no. 4, pp. 1061–1075.
- 3) Dai Pra, P.
Stochastic mean-field dynamics and applications to life sciences.
(2019) *Stochastic dynamics out of equilibrium*, Springer Proc. Math. Stat., 282, Springer, Cham, pp. 3-27
- 4) Cecchin, A., Dai Pra, P., Fischer, M., Pelino, G.,
On the convergence problem in mean field games: a two state model without uniqueness
(2019) *SIAM J. Control Optim.* 57, no. 4, pp. 2443–2466
- 5) Dai Pra, P., Tovazzi, D
The dynamics of critical fluctuations in asymmetric Curie–Weiss models
(2019) *Stochastic Processes and their Applications*, 129 (3), pp. 1060-1095.
- 2) Crimaldi, I., Dai Pra, P., Louis, P.-Y., Minelli, I.G.
Synchronization and functional central limit theorems for interacting reinforced random walks
(2019) *Stochastic Processes and their Applications*, 129 (1), pp. 70-101.
- 3) Andreis, L., Asselah, A., Dai Pra, P.,
Ergodicity of a system of interacting random walks with asymmetric interaction
(2019) *Annales de l'institut Henri Poincaré (B) Probability and Statistics*, 55 (1), pp. 590-606.

- 4) Dai Pra, P., Sartori, E., Tolotti, M.,
Strategic interaction in interacting particle systems
(2018) *Probabilistic Cellular Automata*, Emerg. Complex. Comput., 27, Springer, Cham, pp. 53-67.
- 5) Andreis, L., Dai Pra, P., Fischer, M.
McKean–Vlasov limit for interacting systems with simultaneous jumps
(2018) *Stochastic Analysis and Applications*, published online.
- 6) Conforti, G., Dai Pra, P., Røelly, S.
Reciprocal Class of Jump Processes
(2017) *Journal of Theoretical Probability*, 30 (2), pp. 551-580.
- 7) Andreis, L., Dai Pra, P., Fischer, M.
Simultaneous jumps in interacting particle systems: From neuronal networks to a general framework
(2017) *Springer INdAM Series*, 24, pp. 99-110.
- 8) Crimaldi, I., Dai Pra, P., Minelli, I.G.
Fluctuation theorems for synchronization of interacting Pólya's urns
(2016) *Stochastic Processes and their Applications*, 126 (3), pp. 930-947.
- 9) Collet, F., Dai Pra, P., Formentin, M.
Collective periodicity in mean-field models of cooperative behavior
(2015) *Nonlinear Differential Equations and Applications*, 22 (5), pp. 1461-1482.
- 10) Dai Pra, P., Pigato, P.
Multi-scaling of moments in stochastic volatility models
(2015) *Stochastic Processes and their Applications*, 125 (10), pp. 3725-3747.
- 11) Dai Pra, P., Scoppola, B., Scoppola, E.
Fast Mixing for the Low Temperature 2D Ising Model Through Irreversible Parallel Dynamics
(2015) *Journal of Statistical Physics*, 159 (1), pp. 1-20.
- 12) Dai Pra, P., Louis, P.-Y., Minelli, I.G.
Synchronization via interacting reinforcement
(2014) *Journal of Applied Probability*, 51 (2), pp. 556-568.
- 13) Borile, C., Dai Pra, P., Fischer, M., Formentin, M., Maritan, A.
Time to Absorption for a Heterogeneous Neutral Competition Model
(2014) *Journal of Statistical Physics*, 156 (1), pp. 119-130.
- 14) Dai Pra, P., Giacomini, G., Regoli, D.,
Noise-induced periodicity: some stochastic models for complex biological systems.
(2014) *Mathematical models and methods for planet Earth*, Springer INdAM Ser., 6, Springer, Cham, pp. 25-35.
- 15) Dai Pra, P., Pavon, M., Sahasrabudhe, N.
A Note on the Geometric Interpretation of Bell's Inequalities
(2013) *Letters in Mathematical Physics*, 103 (11), pp. 1165-1170.

- 16) Dai Pra, P., Sartori, E., Tolotti, M.
Strategic Interaction in Trend-Driven Dynamics
(2013) Journal of Statistical Physics, 152 (4), pp. 724-741.
- 17) Dai Pra, P., Fischer, M., Regoli, D.
A Curie-Weiss Model with Dissipation
(2013) Journal of Statistical Physics, 152 (1), pp. 37-53.
- 18) Dai Pra, P., Pavon, M., Sahasrabudhe, N.
A maximum entropy approach to the realizability of Spin correlation matrices
(2013) Entropy, 15 (6), pp. 2448-2463.
- 19) Dai Pra, P., Posta, G.
Entropy decay for interacting systems via the Bochner-Bakry-Émery approach
(2013) Electronic Journal of Probability, 18, (52), pp. 1-21.
- 20) Andreoli, A., Caravenna, F., Dai Pra, P., Posta, G.
Scaling and multiscaling in financial series: A simple model
(2012) Advances in Applied Probability, 44 (4), pp. 1018-1051.
- 21) Dai Pra, P., Scoppola, B., Scoppola, E.
Sampling from a Gibbs Measure with Pair Interaction by Means of PCA
(2012) Journal of Statistical Physics, 149 (4), pp. 722-737.
- 22) Collet, F., Dai Pra, P.
The role of disorder in the dynamics of critical fluctuations of mean field models
(2012) Electronic Journal of Probability, 17, (26), pp. 1-40.
- 23) Collet, F., Dai Pra, P., Sartori, E.
A simple mean field model for social interactions: Dynamics, fluctuations, criticality
(2010) Journal of Statistical Physics, 139 (5), pp. 820-858.
- 24) Dai Pra, P., Louis, P.-Y., Minelli, I.G.
Realizable monotonicity for continuous-time Markov processes
(2010) Stochastic Processes and their Applications, 120 (6), pp. 959-982.
- 25) Dai Pra, P., Tolotti, M.
Heterogeneous credit portfolios and the dynamics of the aggregate losses
(2009) Stochastic Processes and their Applications, 119 (9), pp. 2913-2944.
- 26) Caputo, P., Dai Pra, P., Posta, G.
Convex entropy decay via the Bochner-Bakry-Emery approach
(2009) Annales de l'institut Henri Poincaré (B) Probability and Statistics, 45 (3), pp. 734-753.
- 27) Dai Pra, P., Runggaldier, W.J., Sartori, E., Tolotti, M.
Large portfolio losses: A dynamic contagion model
(2009) Annals of Applied Probability, 19 (1), pp. 347-394.
- 28) Cattiaux, P., Dai Pra, P., Roelly, S.
A constructive approach to a class of ergodic hjb equations with unbounded and nonsmooth cost

(2008) SIAM Journal on Control and Optimization, 47 (5), pp. 2598-2615.

29) Chignola, R., Dai Pra, P., Morato, L.M., Siri, P.
Proliferation and death in a binary environment: A stochastic model of cellular ecosystems
(2006) Bulletin of Mathematical Biology, 68 (7), pp. 1661-1680.

30) Dai Pra, P., Minelli, I.
Stochastic attractors for non-ergodic Markov processes: Some examples
(2006) Stochastics and Dynamics, 6 (3), pp. 395-421.

31) Dai Pra, P., Louis, P.-Y., Minelli, I.
Monotonicity and complete monotonicity for continuous-time Markov chains
(2006) Comptes Rendus Mathematique, 342 (12), pp. 965-970.

32) Boudou, A.-S., Caputo, P., Dai Pra, P., Posta, G.
Spectral gap estimates for interacting particle systems via a Bochner-type identity
(2006) Journal of Functional Analysis, 232 (1), pp. 222-258.

33) Dai Pra, P., Posta, G.
Logarithmic Sobolev inequality for zero-range dynamics
(2005) Annals of Probability, 33 (6), pp. 2355-2401.

34) Dai Pra, P., Posta, G.
Logarithmic Sobolev inequality for zero-range dynamics: independence of the number of particles
(2005) Electronic Journal of Probability, 10, (15), pp. 525-576.

35) Asselah, A., Dai Pra, P.
Hitting times for special patterns in the symmetric exclusion process on $\mathbb{Z}^d$
(2004) Annals of Probability, 32 (4), pp. 3301-3323.

36) Dai Pra, P., Roelly, S.
An existence result for infinite-dimensional Brownian diffusions with non-regular and non-Markovian drift
(2004) Markov Processes and Related Fields, 10, (1), pp. 113-136.

37) Dai Pra, P., Runggaldier, W.J., Tolotti, M.
Pathwise Optimality for Benchmark Tracking
(2004) IEEE Transactions on Automatic Control, 49 (3), pp. 386-395.

38) Colombo, G., Dai Pra, P., Krivan, V., Vrkoč, I.
Stochastic processes for bounded noise
(2003) Mathematics of Control, Signals, and Systems, 16 (2-3), pp. 95-119.

39) Dai Pra, P., Paganoni, A.M., Posta, G.
Entropy inequalities for unbounded spin systems
(2002) Annals of Probability, 30 (4), pp. 1959-1976.

40) Dai Pra, P., Louis, P.-Y., Roelly, S.
Stationary measures and phase transition for a class of probabilistic cellular automata
(2002) ESAIM - Probability and Statistics, 6, pp. 89-104.

- 41) Dai Pra, P., Roelly, S., Zessin, H.
A Gibbs variational principle in space-time for infinite-dimensional diffusions
(2002) Probability Theory and Related Fields, 122 (2), pp. 289-315.
- 42) Dai Pra, P., Di Masi, G.B., Trivellato, B.
Pathwise optimality in stochastic control
(2001) SIAM Journal on Control and Optimization, 39 (5), pp. 1540-1557.
- 43) Asselah, A., Dai Pra, P.
Quasi-stationary measures for conservative dynamics in the infinite lattice
(2001) Annals of Probability, 29 (4), pp. 1733-1754.
- 44) Asselah, A., Dai Pra, P., Lebowitz, J.L., Mounaix, Ph.
Diffusion effects on the breakdown of a linear amplifier model driven by the square of a Gaussian field
(2001) Journal of Statistical Physics, 104 (5-6), pp. 1299-1315.
- 45) Colombo, G., Dai Pra, P.
A class of piecewise deterministic Markov processes
(2001) Markov Processes and Related Fields, 7, (2), pp. 251-287.
- 46) Albertini, F., Dai Pra, P., Prior, C.
Small parameter limit for ergodic, discrete-time, partially observed, risk-sensitive control problems
(2001) Mathematics of Control, Signals, and Systems, 14 (1), pp. 1-28.
- 47) Asselah, A., Dai Pra, P.
First occurrence time of a large density fluctuation for a system of independent random walks
(2000) Annales de l'institut Henri Poincaré (B) Probability and Statistics, 36 (3), pp. 367-393.
- 48) Albertini, F., Dai Pra, P.
Small parameter limit for discrete-time partially observed risk-sensitive control problems
(1999) SIAM Journal on Control and Optimization, 37 (1), pp. 1-32.
- 49) Dai Pra, P., Di Masi, G.B., Trivellato, B.
Almost sure optimality and optimality in probability for stochastic control problems over an infinite time horizon
(1999) Annals of Operations Research, 88, pp. 161-171.
- 50) Dai Pra, P., Meneghini, L., Runggaldier, W.J.
Explicit solutions for multivariate, discrete-time control problems under uncertainty
(1998) Systems and Control Letters, 34 (4), pp. 169-176.
- 51) Asselah, A., Dai Pra, P.
Sharp estimates for the occurrence time of rare events for symmetric simple exclusion
(1997) Stochastic Processes and their Applications, 71 (2), pp. 259-273.
- 52) Dai Pra, P., Rudari, C.

Large deviation limit for discrete-time, totally observed stochastic control problems with multiplicative cost

(1997) Applied Mathematics and Optimization, 35 (2), pp. 221-235.

53) Asselah, A., Dai Pra, P.

Occurrence of rare events in ergodic interacting spin systems

(1997) Annales de l'institut Henri Poincaré (B) Probability and Statistics, 33 (6), pp.

727-751.

54) Dai Pra, P., Runggaldier, W. J., Rudari, C.

On dynamic programming for sequential decision problems under a general form of uncertainty

(1997) ZOR. Zeitschrift für Operations-Research, 45 (1), pp. 81-107.

55) Dai Pra, P., Rudari, C.,

Risk sensitive control and dynamic games: the discrete-time case.

(1996) System modelling and optimization (Prague, 1995), Chapman & Hall, London, pp. 163-170.

56) Dai Pra, P., Den Hollander, F.

McKean-Vlasov limit for interacting random processes in random media

(1996) Journal of Statistical Physics, 84 (3-4), pp. 735-772.

57) Albertini, F., Dai Pra, P.

Recurrent neural networks coupled with linear systems: Observability in continuous and discrete time

(1996) Systems and Control Letters, 27 (2), pp. 109-116.

58) Dai Pra, P., Meneghini, L., Runggaldier, W.J.,

Connections between stochastic control and dynamic games

(1996) Mathematics of Control, Signals, and Systems, 9 (4), pp. 303-326.

59) Albertini, F., Dai Pra, P.

Forward accessibility for recurrent neural networks

(1995) IEEE Trans. Automat. Control, 40, (11), pp. 1962-1968.

60) Dai Pra, P.

A minimum entropy problem for stationary reversible stochastic spin systems on the infinite lattice

(1994) Rend. Sem. Mat. Univ. Padova, 92, pp. 179-194.

61) Dai Pra, P.

Detecting nonergodicity in continuous-time spin systems

(1994) Journal of Statistical Physics, 76 (5-6), pp. 1247-1265.

62) Dai Pra, P.

Large deviations and stationary measures for interacting particle systems

(1993) Stochastic Processes and their Applications, 48 (1), pp. 9-30.

63) Dai Pra, P.

Space-time Large Deviations for interacting particle systems.

(1993) Comm. Pure Appl. Math., 46 (3), pp. 387-422

64) Dai Pra, P.

A stochastic control approach to reciprocal diffusion processes

(1991) Applied Mathematics & Optimization, 23 (1), pp. 313-329.

65) Dai Pra, P., Pavon, M.

On the Markov Processes of Schrodinger, the Feynman-Kac formula and stochastic control.

(1990) Realization and modelling in system theory (Amsterdam 1989), Progr. Systems Control Theory, 3, Birkhauser Boston, Boston, pp. 497-504

66) Dai Pra, P., Pavon, M.

A rigorous Onsager-Machlup formulation of nonequilibrium thermodynamics.

(1989) Applications of mathematics in industry and technology (Siena, 1988), Teubner, Stuttgart, pp. 219-228

67) Dai Pra, P., Pavon, M.

Variational path-integral representations for the density of a diffusion process

(1989) Stochastics Stochastics Rep., 26, (4), pp. 205-226.

68) Dai Pra, P.

A general approximation method for discrete-time nonlinear filtering problems

(1988) Boll. Un. Mat. Ital. B (7) 2, (4), pp. 831-858.

Libri

Caravenna, F., Dai Pra, P.,

Probabilità: un'introduzione attraverso modelli e applicazioni

(2013) Springer Unitext, Springer-Verlag, Milano.

4 Settembre 2020, 2020

Paolo Dai Pra