CURRICULUM VITAE

Juin 14, 2001

Shige PENG

- **Birthdate:** December 8, 1947
- **Birthplace:** Shandong China
- **Family Status:** Married, one child
- **Nationality:** Chinese
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Present Position

- Professor of Mathematics, Shandong University
- Distinguished Professor of Ministry of Education of China, (Cheung Kong Scholarship Program).

Educations

- Diplôme d'Habilitation à Diriger des Recherches, Université de Provence, France, 1992
- Thèse de Docteur de l'Université de Provence, France, 1986
- Thèse de 3ème Cycle de l'Université de Paris–IX, France, 1985

Professional Experience

- 1987——1989 Post Doctor, Institute of Mathematics, Fudan University, P. R. C.
- 1989——1990 Assistant Professor of Institute of Mathematics, Shandong University
- 1990 Associated Professor of Institute of Mathematics Shandong University
- 1991——— Professor of Institute of Mathematics, Shandong University.
- 1999——— Distinguished Professor of Ministry of Education of China, (Cheung Kong Scholarship).

Visiting Appointments

- 09/87——11/87 Division of Applied Mathematics, Brown University Visiting assistant professor
- 11/87——12/88 Courant Institute of Mathematical Sciences, N. Y. U. Visiting assistant professor
- 01/88——04/88 UER Mathtèmatiques, Université de Provence Maître de Conférence Invité de 1ère class
- 10/91——04/92 MIM, Universitè de Provence;
- 05/92 Laboratoire de Probabilitè, Universit'e de Paris VI Professeur invité, 1ème class;
- 5/93——07/94, Université de Provence, Professeur invité.
- 02/95–04/95, 03/98 07/2000, 06/2001, Departement de Mathématiques, Universiè du Maine, Professeur invité, 1ème class;
- 05/95—06/95 Departement de Mathématiques, Universiè de B. Pascal, Professeur invité, 1ème class;
- 12/94—01/95, 01/98—02/98 and 05/99 Departement de Mathématiques, Universiè de Bretagne, Professeur invité, 1ème class;
- 07—09/99 Chercheur associé a CNRS, IRMAR, Universiè de Rennes I;
- 12/98–01/99, Invited lectures given at Princeton University, Columbia University, Wayne State University and Purdue University.

- 06/2000, Departement de Mathématiques, Universiè du Maine, Professeur invité, 1ème class;
- 25/10–05/11/2000, Invited Professor at Osaka University and Tokyo University, Invited lectures at Colleque “Stochastic Control and Related Topics” (Backward Stochastic Differential Equations).
- 26/02–10/03/2002, Invited Professor at Osaka University and Tokyo University.
- 15/01–15/02/2003, IRMAR, Universiè de Rennes I, Professeur invité, 1ème class,
- 15/02–15/03/2003, Departement de Mathématiques, Universiè du Maine, Professeur invité, 1ème class,
- 06/07–13/07/2003, Main lecturer at CIME course “Stochastic Methods in Finance” (Title of lectures “Nonlinear Expectations, Nonlinear Evaluations and Risk Measures”),
- 15/09–14/10/2003, Departement de Mathématiques, Universiè du Maine, Professeur invité, 1ème class;
- 1997—now Centre for Advanced Study, Tsinghua University, Professor of Mathematics;
- 1998—now Institute of Mathematics, Fudan University, Professor of Mathematics;

Research Interests

- Stochastic calculus
- Mathematical finance
- Theory of stochastic differential games
- Recursive Utilities under Risk and Uncertainty
- Stochastic and deterministic optimal control systems
- Controllability of stochastic control systems
- Stochastic and deterministic partial differential equations
- Singular perturbations method for stochastic systems

References

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[2] *Singular perturbations in optimal control problems,* Commande des systèmes complexes technologiques, 20, 359-381, 1986, (with A. Bensoussan).

[3] *Etude de Perturbations Singulières en Contrôle Optimal Deterministe,* Thèse de Docteur de 3ème Cycle de Université de Paris, Faculté de Dauphine, 1985.

[4] *Etude de Perturbations et d'homogéneisation des Systèmes Stochastiques et des Systemes Periodiques*, Thèse de Doctorat, Université de Provence, 1986.

[5] *Analyse Asymptotique et Problème Homogéneisé en Contrôle Optimal Avec Vibrations Rapides,* SIAM.J. of Control and Optimization, 27:4, 673-696, 1989.

[6] *The Maximum Priciple for Stochastic Optimal Control Problems with Mixed Constraints*, (in Chinese), in Proceeding of the Annual meeting on Control Theory and It's Applications, 1988, (with Y. Hu and X. Li).

[7] *A General Stochastic Maximum Principle for Optimal Control Problems,* SIAM J. Cont. 28: 4, 966-979, 1990.

[8] Maximum Principle for Stochastic Optimal Control with Nonconvex Control Domain, in Analysis and Optimization of Systems, A. Bensoussan J. L. Lions eds. Lecture Notes in Control and Information Sciences, 144, (1990), 724-732.

[9] *A New Type of Singularly Perturbed Diffusion Processes and It's Application,* Asymptotic Analysis, 5, 173–186, 1991.

[10] *Maximum Principle for Optimal Control of Generalized Systems,* in Acta. Automatica Sinica, 18: 1, 17-23, 1991, (with X. Li).

[11] *Adapted Solution of a Backward Stochastic Differential Equation,* Systems and Control Letters, 14, 55-61, 1990, (with E. Pardoux).

[12] *On Hamilton-Jacobi-Bellman Equation with Stochastic Coefficients,* in Proceeding of the Annual Meeting on Control Theory and It's Applications, 1989.

[13] *A Generalized Hamilton-Jacobi-Bellman Equation,* Lecture Notes in CIS, 184,, Li Yong eds, 126–134, Springer-Verleg, Berlin, 1991.

[14] *Maximum Principle for Semilinear Stochastic Evolution Control Systems*, in Stochastics, 33 159-180, 1990 (with Y. Hu).

[15] *Probabilistic Interpretation for Systems of Quasilinear Parabolic Partial Differential Equations,* Stochastics, 37, 61–74, 1991.

[16] *Adapted Solution of Backward Stochastic Evolution Equation*, Stochastic Analysis and Applications, 9(4), 445–459, 1991, (with Y. Hu).

[17] *Determination of a Controllable Set for a Controlled Dynamic System*, in J. Austral. Math. Soc. Ser.B 33, 164–179, 1991 (with J. Yong).

[18] *Maximum Principle for Semilinear Stochastic Evolution System,* Chin. Ann. Math., 12B:3, 256–266, 1991, (with Hu Y.).

[19] *Stochastic Hamilton-Jacobi-Bellman Equations,* SIAM Control 30(2), 284-304, 1992.

[20] Document de Synthese Pour l'Habilitation a Diriger des Recherches, University de Provence, 1992.

[21] *A Generalized Dynamic Programming Principle and Hamilton-Jacobi-Bellmen equation,* Stochastics, 38, 119–134, 1992.

[22] Maximum Principle of Optimal Control for Nonlinear Generalized Systems –Infinite Dimensional Case, (with Hu Y. and Li X.), ACTA Math. Appl. Sinica, 15(1), 99–104 1992.

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[24] *A Nonlinear Feynman–Kac Formula and Applications,* Proceedings of Symposium of System Sciences and Control theory, Chen Yong ed. 173-184, World Scientific, Singapore, 1992.

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[26] H^∞ *type Optimal Control Problem,* (with S. Chen X. Li, J. Yong) Chen Yong Ed. 79-95, World Scientific, Singapore, 1992.

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[28] *A Global Representation of All Solutions to a Nonlinear Equation and It's Applications,* Chin. Ann. of Math., 13B(4), 455–462, 1992 (with J. Yong).

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[38] *Backward Stochastic Differential Equations and Applications,* in Advances in Mathematics (Chinese version), **26**, 2, 97–112, 1997.

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[45] *Stationary Backward Stochastic Differential Equations and Associated Partial Differential Equations,* Proba. Theory Related Fields, **115**, 383–399 (with R. Buckdahn), 1999.

[46] *Infinite horizon boundary value problem and applications, J. Diff. Equ.* **155**, 405–422, 1999 (with Y. F. Shi).

[47] *Duplicating and Pricing Contingent Claims with Constrained Portfolios,* Progress in Natural Science, 1999. (with Feng Yang).

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[58] Probabilitic approach to homogenization of viscosity solutions of parabolic PDEs, *Nonlinear differ. equa. appl.* **6** 395–411, 1999 (with R. Buckdahn and Ying Hu).

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[62] A general converse comparison theore for backward stochastic differential equations, *C.R.Acad. Sci. Paris*, t. 333, Serie I, 557–581, 2001. (with F. Coquet, Y. Hu, J. Memin).

[63] Filtration Consistent Nonlinear Expectations and Related g-Expectations, *Probab. Theory Relat. Fields* **123**, 1-27, 2002 (with F. Coquet, Y. Hu and J. Memin).

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[71] Smallest g-supermartingales and related reflected BSDEs with single and double barriers, submitted (with M. Xu).

[72] Necessaryand sufficient condition for comparison theorem of 1-dimensional stochastic differential equations, (with X. Zhu)

Preprints

References

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[2] Asymptotic Analysis for Controlled Diffusion Processes with Highly Ocsillatory Coefficients, to appear;

[3] An associative nonlinear version of conditional expectation, with R. W. R. Darling;

[4] Backward stochastic Differential Equations and Direct Approach in Financial Economics, Preprint;

[5] Stochastic Maximum Principle for Semilinear Evolution Control Systems with Mixed Constraints, submitted, (with Hu Y. and Li X.);

[6] Adapted Solution of Backward Stochastic Differential Equations and Related Partial Differential Equations, to appear;

Planary talks:

- Planary talk: International Workshop "Recent Development in Derivative Securities Markets", June, 6–8, 1998, Hong Kong.
- "International Conference on Applied Statistics, Actuarial Science and Financial Mathematics " Dec. 17- 19, 2002, Hon Kong.
- Main lecturer of CIME: "Stochastic Methods in Finance" , July 7-12, 2003 in Bressanone/Brixen (Italy).
- Main speaker: "International Symposium on Stochastic Process and Applications to Mathematical Finance", March, 6–7, 2002, Ritsmeikan, Japan.
- Main Organizer: Satelite Conference of World Conference of Mathematicians, 2002, Weihai,