

Xiang Zhou

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- CURRENT POSITION ◇ Assistant Professor
Department of Mathematics, City University of Hong Kong (from 2012).
- PAST EXPERIENCE ◇ Research Associate
Division of Applied Math, Brown University, 2010-2012
- ◇ Research Associate
PACM, Princeton University, 2009-2010
- EDUCATION ◇ Ph.D. (2009), Princeton University
Program in Applied and Computational Mathematics
Advisor: Weinan E
Thesis title: Noise-induced transition pathways in nongradient dynamical systems.
- ◇ M.Sc.(2004), B.S.(2001), Peking University
School of Mathematical Sciences. Advisor: Weinan E and Pingwen Zhang
Thesis title: Some topics in complex fluid.
- ACCEPTED PUBLICATION ◇ Convex splitting method for the calculation of transition states of energy functional (with S. Gu, **J. Comp. Phys.** accepted. October 2017) *impact factor: 2.867, rank: 4.7%, citation: 0.*¹
- ◇ Multiscale gentlest ascent dynamics for saddle point in effective dynamics of slow-fast system (with S. Gu, **Comm. Math. Sci.**, accepted. August 2017.) *impact factor: 1.332, rank: 25.6%, citation: 0.*
- ◇ An Improved Adaptive Minimum Action Method for the Calculation of Transition Path in Non-gradient Systems (with Y. Sun, **Commun. Comput. Phys.**, accepted. May 2017). *impact factor: 1.697, rank: 26.4%, citation: 0.*
- PUBLICATION LIST (PEER-REVIEWED) ◇ Sensitivity analysis and optimization of reaction rate (with L. Lin and S. Gu, **Comm. Math. Sci.**, vol.15, No. 6, pp.1507-1525, 2017.) *impact factor: 1.332, rank: 25.6%, citation: 0.*
- ◇ Explore stochastic instabilities of periodic points by transition path theory (with Y. Cao and L. Lin, **J. Nonlinear Sci.**, vol. 26, pp755-786, 2016.) *impact factor: 2.098, rank: 5.5%, citation: 1.*
- ◇ Finding Transition pathways on manifolds (with T. Li, X. Li, **Multiscale Modeling and Simulation: A SIAM Interdisciplinary Journal**, vol.14, pp. 173-206, 2016) *impact factor: 2.036, rank: 34.2%, citation: 2.*
- ◇ Iterative minimization algorithm for efficient calculations of transition states (with W. Gao and J. Leng, **J. Comp. Phys.** vol. 309, pp 69-87. 2016) *impact factor: 2.867, rank: 4.7%, citation: 1.*
- ◇ An iterative minimization formulation for saddle point search (with W. Gao and J. Leng, **SIAM J. Numer. Anal.**, 53(4), pp.1786–1805, 2015) *impact factor: 2.254, rank: 7.5%, citation: 1.*
- ◇ Efficient rare event simulation for failure problems in random media (with J. Liu and J. Lu, **SIAM J. Sci. Comput.**, 37(2), pp. A609–A624, 2015.) *impact factor: 2.402, rank: 10.8%, citation: 1.*
- ◇ Escaping from an attractor: Importance sampling and rest points I (with Paul Dupuis and K. Spiliopoulos, **Ann. Appl. Prob.**, 25(5), 2909-2958, 2015) *impact factor: 1.833, rank: 14.0%, citation: 4.*

¹Impact factor is base on 5-year JCR in 2015. The citation is from Scopus (excluding self-citation).

- ◇ A cross entropy method for mixture (with Hui Wang, *ACM Transactions on Modeling and Computer Simulation (TOMACS)*, 25(1), pp. 6:1-6:20, 2015). *impact factor: 1.061, rank: 78.2%, citation: 3.*
- ◇ Extreme analysis of a random ordinary differential equation (with J. Liu, **J. Appl. Probab.**, 51(4), pp.1021-1036, 2014). *impact factor: 0.864, rank: 65.4%, citation: 0.*
- ◇ On the failure Probability of one dimensional random material under delta external force (with J. Liu, **Comm. Math. Sci.**, 11, pp. 499-521, 2013). *impact factor: 1.332, rank: 25.6%, citation: 0.*
- ◇ Failure of random materials: a large deviation and computational study (with J. Liu, W. E, *et al*) *Proceedings of the 2011 Winter Simulation Conference. Dec. 2011, pp 3779-3778.*
- ◇ Subcritical bifurcation in spatially extended systems (with Weinan E and Xiuyuan Cheng, **Nonlinearity**, 25(2012), 761). *impact factor: 1.485, rank: 23.4%, citation: 4.*
- ◇ The gentlest ascent dynamics (with W. E, **Nonlinearity**, 24(2011), 1831). *impact factor: 1.485, rank: 23.4%, citation: 27.*
- ◇ Study of the noise-induced transition and the exploration of the phase space for the Kuramoto-Sivashinsky equation using the minimum action method. (with X. Wan, W. E, **Nonlinearity**, 23(2010),475) *impact factor: 1.485, rank: 23.4%, citation: 13.*
- ◇ Study of noise-induced transitions in the Lorenz system using the minimum action method. (with W. E, **Comm. Math. Sci.**, 8(2009), 341-355). *impact factor: 1.332, rank: 25.6%, citation: 12.*
- ◇ Time-varying perturbations can distinguish among integrate-to-threshold models for perceptual decision-making in reaction time tasks. (with KongFatt Wong-Lin and Philip Holmes, **Neural Computation**, 21(2009), 2336-2362) *impact factor: 1.807, rank: 43.5%, citation: 11.*
- ◇ Adaptive minimum action method for the study of rare events. (with W. Ren and W. E, **J. Chem. Phys.** 128(2008), 104111). *impact factor: 2.950, rank: 24.3%, citation: 22.*
- ◇ Analysis of 1+1 dimensional stochastic model of liquid crystal polymer flows. (with T. Li and P. Zhang **Comm. Math. Sci.** 2(2004),295-316). *impact factor: 1.332, rank: 25.6%, citation: 4.*

EXTERNAL RESEARCH GRANT

- ◇ **ECS(109113)** (01/2014-12/2016): *Rare-event Study for Stochastic Partial Differential Equations.* **PI.** 710,223 HKD.
- ◇ **GRF(11304314)** (01/2015-12/2017): *Explore Transition States on Energy Surface: Numerical Analysis and Algorithmic Developments.* **PI.** 614,810 HKD.
- ◇ **GRF(11304715)** (01/2016-12/2018): *Study of Rare Events for Empirical Measures of Stochastic Interacting Systems.* **PI.** 631,972 HKD.
- ◇ **GRF(11337216)** (01/2017-12/2019): *Optimal Transition Pathways Under Static or Fluctuating Constraints.* **PI.** 488,501 HKD.

INTERNAL GRANT

- ◇ CityU Start-Up Grant(08/2012-08/2014). **PI:** *Asymptotic Analysis and Importance Sampling for Stochastic Partial Differential Equations.* 200,000HKD
- ◇ CityU Applied Research Grant (ARG): Associate Investigator. *Energy-efficient, High-speed, High-resolution Image Sensor for Biomedical and Wearable Applications* (Principal Investigator Dr. Derek HO (AP))

TEACHING ACTIVITIES

- ◇ **Construction of New Course**
2013 Fall, **MA 4546 *Introduction to Stochastic Process***
An elective course for Bachelor of Science in Computing Mathematics, Department of Mathematics, City University of Hong Kong.
- ◇ **Teaching Start-up Grant**
Teaching Start-Up Grant (1/8/2013–31/1/2015, 10,000HKD) : *Experimentation-based Teaching Methodology for Undergraduate Applied Math Courses* (PJ# : 6000441).
- ◇ **Department of Mathematics, City University of Hong Kong**
2012 Fall: MA 2503 *Linear Algebra*.
2013 Spring : MA 3004 *Numerical Method*.

2013 Fall : MA 2503 *Linear Algebra*; MA 4546 *Introduction to Stochastic Process*
2014 Spring : MA 3518 *Applied Statistics*
2014 Fall: MA 4546 *Introduction to Stochastic Process*
2015 Spring : MA 3518 *Applied Statistics*; MA 0101 *Basic Engineering Math* (100+ students)
2015 Fall: MA 4546 *Introduction to Stochastic Process*; MA 3518 *Applied Statistics*
2016 Spring : MA 1201 *Calculus and Basic Linear Algebra II* (100+ students)
2016 Fall: MA 4546 *Introduction to Stochastic Process*; MA 3518 *Applied Statistics*
2017 Spring : MA 1201 *Calculus and Basic Linear Algebra II* (100+ students)
2017 Fall: MA 1200 *Calculus and Basic Linear Algebra I* (100+ students); MA 4546 *Introduction to Stochastic Process*

◇ **Division of Applied Mathematics, Brown University**

2011 Fall: APMA1210 *Operations Research: Deterministic Methods*

DISCOVERY-
ENRICHED
CURRICULUM
(CITYU)

- ◇ 2015/2016: Supervise the project of MA3518 – *Style Differences Between Soccer Leagues and The Effects of Schedule* by the team of SHEN Feng, MAO Shaokun, ZHENG Zequn.
 - The winner of **CSE D&I Gala 2016 Best Poster Presentation Award**
 - Poster Presentation in the CityU Employers' Luncheon 2015-2016 Meeting on 30 March 2016 (organized by SDS, CityU)
- ◇ 2016/2017: Supervise the project of MA3518 – *Modeling Student Housing Rent in Hong Kong* by the team of WU Yue, WANG Zhongdi and HE Danyun.
 - The winner of **CSE D&I Gala 2017 Best Poster Presentation Award**
 - Poster Presentation in the CityU Employers' Luncheon 2016-2017 Meeting on 30 March 2016 (organized by SDS, CityU)
- ◇ Supervision of [the Final Year Project MA 4530](#)
Among totally 4 students supervised, 2 continued the PhD studies in USA applied math or statistics institutions.
 - 2013-2014: WU Liwei, *Extreme Event Modeling*.
 - 2014-2015: CAO Yu, *Rare Event in Stochastic Systems*.
 - 2015-2016: XIAO Jianpeng, *Reduced Boltzmann Machine*; HUANG Yiqin, *Monte Carlo Simulation of Default Risk in Bond Market*.
 - 2016-2017: SHEN Lue *Convolutated Neuron Network*; CHAN Chun Sik, *Robust Stochastic Approximation Approach to Stochastic Programming*.
 - 2017-2018: SHI Zhongjie; WU Yue

CITYU
SERVICE

- ◇ (2013 – 12/2016) Co-organizer of [CityU MA Departmental Colloquia](#)
- ◇ 2016/2017 Year: Departmental Administration Duties
 - BSCM Programme Committee; Joint Staff/Student Consultative Committee (JSSCC); Year 1 tutor; Student Orientation Departmental Coordinator; Student Project Coordinator (Small scale project - MA4533); PALS I Coordinator of MA4546; Library Liaison
- ◇ 2015/2016 Year: Departmental Administration Duties
 - BSCM Programme Committee; Joint Staff/Student Consultative Committee (JSSCC); Year 4 Tutor; Student Orientation Departmental Coordinator; PALS I Coordinator of MA4546; Library Liaison; Colloquium
- ◇ 2014/2015 Year: Departmental Administration Duties
 - BSCM Programme Committee; Joint Staff/Student Consultative Committee (JSSCC); Year 3 Tutor; Student Orientation Departmental Coordinator; PALS I Coordinator of MA4546; Library Liaison; Colloquium
- ◇ 2013/2014 Year: Departmental Administration Duties
 - Year 1 Tutor; Library Liaison; Colloquium

SUPERVISION ◇ PhD students:

- Yiqun Sun (09/2013 – 08/2017)
- Shuting Gu (2014 – current)

◇ Postdoctoral scholars:

- Dr. Junfei Cao (Jan. 2015 – Feb. 2016)
- Dr. Houying Zhu (April 2016 – March 2017)
- Dr. Ling Lin (April 2016 – August 2017)

PROFESSIONAL SERVICE

Journal refereeing :
Math. Psychology; Comm. Math. Sci.; J. Phys. A: Math. Theor.; Introduction to Operations Research by Hillier, 10edition; SCIENCE CHINA Mathematics; Pure and Applied Mathematics Quarterly; Archive for Rational Mechanics and Analysis; SIAM Numerical Analysis; Computer Methods in Applied Mechanics and Engineering; J. Comp. Phys.; Comm. in Comp. Phys.

◇ Journal Editor: *International Journal of Mathematics and Statistics*. (2015-2017).

◇ Mini-symposium Organizer:

- SIAM AN12 (July 2012, Minneapolis, MN). mini-symposium of “modeling of rare events” .
- The 8th International Conference on Computational Physics (ICCP8) January, 2013, Hong Kong, mini-symposium of “modeling of rare events” .
- SIAM UQ14 (April 2014, Savannah, GA). mini-symposium of “Efficient Algorithms for Rare Events” .
- ICIAM 2015 (August 2015, Beijing). mini-symposium on “ Rare Events” .
- SIAM UQ16 (April 2016, EPFL, Switzerland). mini-symposium of “Rare Events for Stochastic Dynamics and Random Fields” .
- SIAM UQ18 (April 2018, Orange County, CA). mini-symposium of “ Advances in numerical techniques for the study of rare events” .

◇ Conference/Workshop Organizer:

- [Workshop on Rare-event Stochastic Computing and Application](#), Jan. 2014. City University of Hong Kong.
- Workshop in Stochastic and Multi-scale Modelling for Material Sciences and Biology. July 30, 2015. City University of Hong Kong.
- [International Conference on Applied Mathematics 2016](#) (co-organizer) May 30 - Jun 2, 2016. City University of Hong Kong.