

Xiong Ding

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Education

Ph.D. in Physics	Georgia Institute of Technology	Atlanta, GA, USA	Aug. 2012 – May. 2017
• adviser: Prof. Predrag Cvitanović • Research area : nonlinear dynamics, cycle expansion theory, complex Ginzburg-Landau equation			
M.S. in Computer Science & Engineering	Georgia Institute of Technology	Atlanta, GA, USA	Jan. 2016 – Jun. 2016
• GPA: 3.86/4.0			
B.S. in Physics	Wuhan University	Wuhan, China	Sep. 2008 - Jun. 2012

Software Developer Experience

Web developer @ online course: <i>Geometry of Chaos</i>	Atlanta, GA, USA	Jan. 2015 – Jul. 2015
www.chaosbook.org/course1		

- **Achievement:** Design and implement online autograder
- **Framework:** Django in Python
 - **main Features:** • Email back grades automatically • Publish grade statistics • Grade panel for course instructors

Software Engineer @ Airbnb	San Francisco, CA, USA	May. 2017 – Present
Home Infra team		

- **Achievement:** Build and maintain Ebert (the review service) for *airbnb.com*
- **Framework:** Dropwizard
 - **main Features:** • Mcrouter cache enabled • Horizontal scalable • Accompanied by mutation publisher

Research Experience

Center for Nonlinear Science, Georgia Institute of Technology	Atlanta, GA, USA	Jun. 2013 – May. 2017
Role : Research Assistant Adviser : Prof. Predrag Cvitanović		

- **Research topic:** *Computation of Floquet vectors in Kuramoto-Sivashinsky system*
 - **main Result:** The Floquet multipliers of Periodic orbits in high dimensional system usually spans a large orders of magnitudes. The periodic eigendecomposition is the right tool to obtain Floquet spectrum and vectors to high accuracy. See paper[2] for more detail.
- **Research topic:** *Investigation of the local dimension of inertial manifolds in chaotic systems*
 - **main Result:** By studying the shadowing cases of periodic orbits in Kuramoto-Sivashinsky system, we show strong evidence that the inertial manifold has dimension 8. see paper [1] for more details.
- **Research topic:** *Symbolic dynamics in symmetry reduced 1-d Kuramoto-Sivashinsky system*
 - **main Result:** In the symmetry reduced state space, the attractor of 1-d Kuramoto-Sivashinsky system is low dimensional. By constructing appropriate Poincaré section, we propose to obtain the symbolic dynamics.

School of Mathematics, Georgia Institute of Technology	Atlanta, GA, USA	Jan. 2016 – Jun. 2016
Role : Cooperation with Prof. Sung Ha Kang from Math department		

- **Research topic:** *Time-step adaptive exponential integrator for soliton explosions in 1d and 2d cubic quintic Ginzburg-Landau systems*
 - **main Result:** Study the performance of exponential integrator in Ginzburg-Landau system, and add time step control into a few popular exponential integrators. See paper [3].

Conferences & Talks

SIAM Conference on Application of Dynamical Systems	Snowbird, Utah, USA	May 2015
Talk: Periodic Eigendecomposition and Its Application in Nonlinear Dynamics	Coauthor: Prof. P. Cvitanović	

Dynamics Days US	Atlanta, GA, USA	Jan. 2014
Poster: Lyapunov exponents, Floquet exponents and covariant vectors in Kuramoto-Sivashinsky equation	Coauthor: Prof. P. Cvitanović	

Skills

Programming : **Proficient :** C/C++, Java, Matlab; **Familiar :** Ruby, Python

Publications

- [1] **X. Ding**, H. Chaté, P. Cvitanović, E. Siminos, and K. A. Takeuchi , *Estimating the dimension of an inertial manifold from unstable periodic orbits* , *Phys. Rev. Lett.* **117**, 024101 (2016)
- [2] **X. Ding** and P. Cvitanović , *Periodic Eigendecomposition and its application in Kuramoto-Sivashinsky system* , *SIAM J. Appl. Dyn. Syst.* **15**, 1434–1454 (2016)
- [3] **X. Ding** and S. H. Kang , *Adaptive time-stepping exponential integrators for cubic-quintic complex Ginzburg-Landau equations* , *arXiv:1703.09622* (2017)
- [4] **X. Ding** and P. Cvitanović , *Exploding relative periodic orbits in cubic-quintic complex Ginzburg-Landau equation* , *In preparation* (2017)