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	*GPA: 3.86/4.0*	Georgia Institute of Technology	*Atlanta, GA, USA*	Jan. 2016 – Jun. 2016
B.S. in Physics		*Wuhan University*	Wuhan, China	*Sep. 2008 - Jun. 2012*

Software Developer Experience

Web developer @ online course: *Geometry of Chaos*	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

Skills

Programming :	**Proficient :** C/C++, Java, Matlab; **Familiar :** Ruby, Python
Domain knowledge :	Dropwizard, ElasticSearch
Web :	Django with Python, Ruby on Rails

Research Experience

Center for Nonlinear Science, School of Physics, 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

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)