

Xiong Ding

PHYSICS PH.D. • SOFTWARE ENGINEER

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Industry Experience

Airbnb	Software Engineer	San Francisco, CA, USA	May. 2017 – Present
Search ranking team _____			Mar. 2019 – Present
<ul style="list-style-type: none">• Main responsibility:<ul style="list-style-type: none">– Migrate user profiler features for a customized KV store to HBase and use Apache Flink for better streaming performance.– Prepare training data of big size by daily scheduled spark jobs.• Used framework & tools: Spark, Hive, Airflow, Scala			
Home infra team _____			May. 2017 – Feb. 2019
<ul style="list-style-type: none">• Main contributions:<ul style="list-style-type: none">– Lead the project of building the next generation of review service, i.e., Ebert2.0, for Airbnb. This is also a review platform that supports homes reviews, experience reviews, LuxuryRetreat reviews and so on. We have successfully migrated 340+M reviews and 1B+ review categories to new review schema without downtime, and there were only 3 inconsistent records after migration.– Collaborate with storage team to setup the derived data store to provide review aggregated data, which improved the tail latency by half (P95 latency from 85ms to 45ms).– Migrate AWS EC2 review Elasticsearch cluster to AWS managed ES cluster. Also upgrade ES version from 1.4.5 to 6.2.1– Maintaining current review service add and new features such as group companion review, highlighted reviews on checkout page, review ranking logic on production page, reviews pipelines for SEO purpose and so on.• Core metrics&features:<ul style="list-style-type: none">– QPS: Average: 12K. Peak: 15K. Traffic comes from room description page, user profile page, checkout page and so on.– Latency: Overall, P95: ~45ms; ~P99: ~80ms; P999: ~250ms. Different endpoints have different latency.– Features: • Mrouter cache enabled • Horizontal scalable • Accompanied by mutation publisher• Used framework & tools: Dropwizard, Chef, Airflow, Elasticsearch, Mrouter Cache, Powergrid(multithreading)			

Skills

Programming :	Proficient : Java; Familiar : Ruby, Scala, C++
Domain knowledge :	Dropwizard, ElasticSearch, Spark, Airflow, Hive
Web :	Ruby on Rails

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	GPA: 3.75/4.0	Wuhan University	Wuhan, China	Sep. 2008 - Jun. 2012

Research Experience

Center for Nonlinear Science, School of Physics, Georgia Institute of Technology	Atlanta, GA, USA	Jun. 2013 – May. 2017
<ul style="list-style-type: none">• Research topic: <i>Computation of Floquet vectors in Kuramoto-Sivashinsky system</i><ul style="list-style-type: none">– main Result: Find the smallest eigenvalue of Floquet matrix to be order of 10^{-3000} with relative accuracy 10^{-14}.– tools/skills used: C++, Boost.Python, Boost.Numpy, HDF5, Arpack, Matrix decomposition, Eigen• Research topic: <i>Investigation of the local dimension of inertial manifolds in chaotic systems</i><ul style="list-style-type: none">– main Result: We show strong evidence that the inertial manifold of 1-d Kuramoto-Sivashinsky system has dimension 8.– tools/skills used: C++, Matlab, Exponential integrators• Research topic: <i>Symbolic dynamics in symmetry reduced 1-d Kuramoto-Sivashinsky system</i><ul style="list-style-type: none">– main Result: In the symmetry reduced state space, we propose to obtain the symbolic dynamics of 1-d KS equation by constructing appropriate Poincaré sections.– tools/skills used: C++, Matlab, Eigen, Cycle expansion theory		
School of Mathematics, Georgia Institute of Technology	Atlanta, GA, USA	Jan. 2016 – Jun. 2016
<ul style="list-style-type: none">• Research topic: <i>Time-step adaptive exponential integrator for soliton explosions in 1d and 2d cubic quintic Ginzburg-Landau systems</i><ul style="list-style-type: none">– main Result: Formulize a new time-step adaptive exponential integrator for complex GL equation.– tools/skills used: Numerical PDE, C++, Boost, Numpy, Matplotlib		

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 \(2017\)](#)