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*

- Main contribution:
  - Migrate user profiler features from a customized KV store to HBase and use Apache Flink for better streaming performance.
  - [In Progress] Use a new way to attribute user searches to their final bookings, which increased the size of training data. Backfill historical attribution data and train our neural network model on this augmented training data.
- Used framework & tools: Spark, Hive, Airflow, Scala

Home infra team *May. 2017 – Feb. 2019*

- Main contributions:
  - Build 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 had 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 real-time review aggregated data, i.e., review counts, review rating histogram and so on, which improved the tail latency by half.
  - 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.
- Features: • Mcrouter cache enabled • Horizontal scalable • Accompanied by mutation publisher
- Used framework & tools: Dropwizard, Chef, Airflow, Elasticsearch, Mcrouter Cache, Powergrid(multithreading)

Skills

Programming : **Proficient :** Java; **Familiar :** Ruby, Scala, C++

Domain knowledge : Mysql, 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*

- Research topic: *Computation of Floquet vectors in Kuramoto-Sivashinsky system*
  - 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: *Investigation of the local dimension of inertial manifolds in chaotic systems*
  - 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: *Symbolic dynamics in symmetry reduced 1-d Kuramoto-Sivashinsky system*
  - 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*

- Research topic: *Time-step adaptive exponential integrator for soliton explosions in 1d and 2d cubic quintic Ginzburg-Landau systems*
  - 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)