Xiong Ding

PHYSICS PH.D. · SOFTWARE ENGINEER

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Skills

Programming : C++, Python, Java
Skills : Numerical PDE, Matrix analysis, MS SQL server, ElasticSearch, Kafka, Spark, Airflow

Industry Experience

Ziphq Software Engineer San Francisco, CA, USA *04/18/2022 – Present*

Infra structure

- Onboard Kafka and build a streaming platform
  - Onboard AWS MSK and wrap the producer/consumer library to be used our engineers.
  - Set up database CDC and use mutation events from database to drive varisou async computations.
- Onboard OLAP database Clickhouse
  - Evaluate various OLAP databases and chose Clickohuse to power Zip insight functionality.
- Used framework & tools: AWS, Kafka, Clickhouse, Kubernetes

Citadel LLC Software Engineer Chicago, IL, USA *09/03/2019 – 03/18/2022*

Reconciliations and Control infra team

- Build rec&control system v3:
  - Help design the new reconciliation system from scratch. Share my knowledge about the old system to all new members in the team.
  - Build infra components of the new system such as Kafka C++ client, datadog C++ client, logging module and so on.
  - Help build the core matching C++ service using Apache Arrow. Optimize the matching process, especially the hot path to reduce run time as much as possible.
- Disaster Recovery:
  - Main contributor for disaster recovery (DR) planning and execution.
  - Write the scripts that submit CName change requests, change load balance configuration, sync files between different data centers, and etc.
  - Successfully switch R&C data centers multiple times with no user impact.
- Other responsibilities:
  - Maintain v2 system and add business features on a regular basis. Maintain a good relationship with business side and act as POC for production issues.
  - Help automate Futures/Options, FTR (Financial Transmission Right), and a few other OTC products reconciliation process.
- Used framework & tools: C++ Boost, Apache.Arrow, Spring Boot, multithreading, MS SQL server, Kafka, Datadog

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Airbnb Software Engineer San Francisco, CA, USA *05/22/2017 – 08/27/2019*

Search ranking team *03/01/2019 – 08/27/2019*

- Main contribution:
  - migrate the heaviest job from RDD to Dataset, whose runtime was reduced from 3h to 30m.
  - Use a new way to attribute user searches to their final bookings, which doubled the size of training data.
- Used framework & tools: Spark, Hive, Airflow, Scala

Home infra team *05/22/2017 – 2/28/2019*

- Main contributions:
  - Build the next generation of review service for Airbnb. This is a review platform that supports different business verticals' reviews. We had successfully migrated 340+M reviews and 1B+ review categories to new review schema without downtime.
  - 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
- Used framework & tools: Dropwizard, Chef, Airflow, Elasticsearch, Mcrouter Cache, Powergrid(multithreading)

Education

Ph.D. in Physics		Georgia Institute of Technology	Atlanta, GA, USA	*08/15/2012 – 05/05/2017*
M.S. in Computer Science & Engineering	*GPA: 3.86/4.0*	Georgia Institute of Technology	Atlanta, GA, USA	*01/01/2016 – 06/01/2016*
B.S. in Physics	*GPA: 3.75/4.0*	Wuhan University	Wuhan, China	*09/01/2008 - 06/05/2012*

Research Experience

Center for Nonlinear Science, School of Physics, Georgia Institute of Technology Atlanta, GA, USA *06/01/2013 – 05/05/2017*

- 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}.
- 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.
- 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.

School of Mathematics, Georgia Institute of Technology Atlanta, GA, USA *01/01/2016 – 06/01/2016*

- 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.

Selected 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)