

# JIANFENG CHEN

(919)-457-2034 ◊ <https://jianfeng.us> ◊ [jchen37@alumni.ncsu.edu](mailto:jchen37@alumni.ncsu.edu)

## WORK EXPERIENCE

### Meta Platforms (Facebook) | Research Scientist

Jul 2019 - Present

#### Meta Core App Data Framework

- Major contributor to (*Rust supported*) query and model compilation for client-side GraphQL in Meta family of apps, including Facebook/Instagram/Oculus etc.;
- Prototyped and optimized the GraphQL compiler and builder for mobile Apps. Medium(p50) built time for GraphQL modules in Facebook app reduced from 38 minutes to 17 seconds;
- Led and created GraphQL developing tool-chains, provided real-time validation tools to mobile developers;
- Worked and promoted the fragment variable as a new feature to the GraphQL open source specifications;
- Invited talk (Droidcon 2021): "Integrating custom language with android studio: GraphQL case study".
- Mentored 3 intern projects and onboarded one mid/senior-level engineer.

## EDUCATION

### PhD in Computer Science

Aug 2014 - May 2019

North Carolina State University, GPA: 4.0/4.0

Advisor: Dr. Tim Menzies (IEEE Fellow)

Dissertation: On the Value of Sampling and Pruning for Search-Based Software Engineering

### Master in Computer Science (*En route*)

Aug 2014 - Dec 2018

North Carolina State University, GPA: 4.0/4.0

Coursework: Data-to-Knowledge | DevOps | Advanced AI | Algorithm Analysis | Data Mining | Automated SE

### BS in Computer Science

Sep 2010 - May 2014

Shandong University, China, GPA: 89.93/100

Coursework: Data Structure | OS | Networking | Database System | Numerical Analysis | Image Processing

## SKILLS AND INTERESTS

**Language:** Rust, Python, C++, Java, JavaScript, Matlab and SQL;

**Data analysis tools:** Scikit-learn, SciPy, Pandas, jMetal, Gephi;

**DevOps tools:** Jenkins, Ansible, Travis-CI, AWS Elasticsearch, S3, Docker, Redis.

## INTERN AND RESEARCH EXPERIENCE

### Spike: Predicting Breakdowns in Cloud Services

Sep 2018- Apr 2019

*Cooperation project with LexisNexis Legal & Professional*

- Fetched cloud services monitoring data in microservices systems;
- Cleaned up the data and built machine learning models to predict the breakdowns 30 minutes ahead;
- Got a alarm system for service spikes with recalls and precision of 75% or above;
- Published results on Symposium on the Foundations of Software Engineering 2019 (Industrial track).

### Cross-Stan: Embedding Bayesian Modeling in Python and C++ Programs

May 2018- Aug 2018

*Internship at Facebook (Machine learning experience group)*

- Created the tool *CxStan* to embed Bayesian Modeling engine, Stan, into Python and C++ programs;
- Built a hierarchical framework to accelerate the Monte Carlo Sampling for the Stan modeling;
- Integrated the tool into the buck build tool, making the Stan engine as a service;
- Applied the *CxStan* to some Facebook services' traffic policing.

### Automated Configurations for Cloud-based Workflows

May 2017 - Aug 2017

*North Carolina State University*

- Presented a novel stochastic method for rapidly configuration cloud-based workflows;
- Automatically deployed the workflow with more than 500 sub-tasks to AWS platform. Save up to 30% economy cost within specific deadline requirement, compared to default greedy deployment policy in AWS.

## LACE Data Privatization Tools and its Application

Aug 2016 - Nov 2016

NSA funded project in RAISE Lab

- Distributed a data anonymization package in Python (see <https://lace.readthedocs.io/>); tested package via Travis-CI;
- Applied my package to education and medical data sets. Evaluate data set utility through supervised learning.

## Fast Principal-component-analysis (F-PCA) Method for Flight Status Log

May 2016 - Aug 2016

Google Summer of Code program 2016

- Accepted by Google GSoC2016 program among 18,981 applicants (**accept rate: 6%**);
- Hierarchical clustering a dataset(flight status log) with more than 20M entries top-down and bottom-up. Create a PCA-like dimension reduction algorithm and speed it up by spark. Compared my own algorithm with PCA.

## Sampling vs. Searching in Search-based SE

Dec 2014 - Aug 2017

North Carolina State University

- Created a sampling technique to solve the software product line problem. Deployed the algorithm into platform LSF by MPI; implemented a job schedule engine. Reduced the experiment time from 2 months CPU hrs into 11.5 hrs.
- Modeled the Linux Kernel modules in CNF sets. Created the decision tree surrogate model. By combining SAT solvers, found a way to configure large software systems 2000x faster. Published the results in TSE.

## PUBLICATIONS

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[1] Xueqi Yang, **Jianfeng Chen**, Rahul Yedida, Zhe Yu, and Tim Menzies. "Learning to recognize actionable static code warnings (is intrinsically easy)." Empirical Software Engineering (2021)

[2] Shu Rui, Tianpei Xia, **Jianfeng Chen**, Laurie Williams, and Tim Menzies. "How to better distinguish security bug reports (using dual hyperparameter optimization)." Empirical Software Engineering (2021)

[3] **Jianfeng Chen**, Joymallya Chakraborty, Philip Clark, Kevin Haverlock, Snehit Cherian and Tim Menzies. "Predicting Breakdowns in Cloud Services (with SPIKE)". Symposium on the Foundations of Software Engineering (ESEC/FSE 2019 - Industry Paper Track)

[4] Junjie Wang, Song Wang, **Jianfeng Chen**, Tim Menzies, Qiang Cui, Miao Xie and Qing Wang. "Characterizing Crowds to Better Optimize Worker Recommendation in Crowdsourced Testing.". IEEE Transactions on Software Engineering(2019).

[5] **Jianfeng Chen**, and Tim Menzies. "RIOT: A Stochastic-Based Method for Workflow Scheduling in the Cloud." 2018 IEEE 11th International Conference on Cloud Computing (CLOUD). IEEE, 2018. (Accept rate: 15%).

[6] Vivek Nair, Amrit Agrawal, **Jianfeng Chen**, Wei Fu, George Mathew, Tim Menzies, Leandro Minku, Markus Wagner, and Zhe Yu. "Data-Driven Search-based Software Engineering." The Mining Software Repositories (MSR) 2018.

[7] **Jianfeng Chen**, Vivek Nair, Rahul Krishna, and Tim Menzies. "Sampling as a Baseline Optimizer for Search-based Software Engineering." IEEE Transactions on Software Engineering (2018).

[8] **Jianfeng Chen**, Vivek Nair, and Tim Menzies. "Beyond evolutionary algorithms for search-based software engineering." Information and Software Technology (2017).

[9] Vivek Nair, Tim Menzies, and **Jianfeng Chen**. "An (accidental) exploration of alternatives to evolutionary algorithms for SBSE." In International Symposium on Search Based Software Engineering, pp. 96-111. Springer, Cham, 2016.

[10] Yijun Yang, Wei Zeng, and **Jianfeng Chen**. "Equiareal parameterizations of NURBS surfaces". Graphical models 76.1 (2014)