

Chuan Jiang

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Education

Purdue University

Ph.D. in Computer Engineering, ECE

Aug 2016 – May 2022

West Lafayette, IN

Shanghai Jiaotong University

Bachelor of Science in Computer Engineering, ACM Honored Class

Aug 2012 – June 2016

Shanghai, China

Work Experience

Meta

Research Scientist

July 2022 – Present

Seattle

- Responsible for enhancing the safety of network access by developing policies to prevent risky operations.
- Designed, developed, and maintained a tracing tool to track service chains leading to network operations, improving visibility into network operations. Owned the integration of this tool with other services, handled user requests, and ensured ongoing maintenance.
- Led a project to monitor risky manual operations on the network and restrict access permissions.
- Contributed to critical network infrastructure services including maintenance, health monitoring, and automated repair systems.

Meta

Software Development Engineer Intern

June 2019 – Aug 2019

Menlo Park, CA

- Developed toolsets for statistical analysis of the system to diagnose network incidents.
- Optimized system parameters using statistical insights, enhancing the accuracy of network incident diagnosis.
- Designed a mechanism leveraging machine learning to identify and filter out false incident alarms.

Meta

Software Development Engineer Intern

June 2018 – Aug 2018

Menlo Park, CA

- Designed and implemented a new dispatching pipeline in the network monitoring system to realize push-based collection for monitoring tasks.
- Implemented locality preference in the dispatching pipeline to reduce latency for processing tasks.
- Implemented access control in the backend to avoid overloading.

Microsoft Research Asia

Software Development Engineer Intern

Aug 2015 – Feb 2016

Beijing, China

- Proposed and implemented a tool to perform stroke analysis for texts in images.
- Implemented an algorithm to identify text baselines in images based on stroke analysis to improve the precision of text recognition.

Research Experience

Flexile: Designing routing to minimize flow loss at desired percentiles

Advisor: Prof. Sanjay Rao and Prof. Mohit Tawarmalani

Feb 2020 – March 2022

Purdue, West Lafayette, IN

- Reduced flow loss at desired percentiles by exploiting that different flows could meet their bandwidth requirements over different sets of failure states.
- Proposed and implemented a decomposition algorithm to reduce solving time from hours to tens of seconds for large networks.
- Implemented a testbed to emulate the proposed routing scheme using Mininet and Open vSwitch.

PCF: Resilient Routing with Worst-case Guarantees

Advisor: Prof. Sanjay Rao and Prof. Mohit Tawarmalani

Dec 2018 – Aug 2020

Purdue, West Lafayette, IN

- Proposed a novel resilient routing schemes to enhance the flexibility of network response while ensuring that the performance under failure can be tractably modeled using formal optimization method.
- Provided theoretical proofs on benefits over Microsoft's FFC (state-of-the-art), and feasibility of implementation.
- Showed by experiments that PCF can sustain significantly higher throughput than FFC.

Lancet: Designing network for pruned failure sets

Feb 2018 -- July 2019

Advisor: Prof. Sanjay Rao and Prof. Mohit Tawarmalani

Purdue, West Lafayette, IN

- Codeveloped a divide-and-conquer algorithm to efficiently identify failure scenarios that the network can handle.
- Designed a protection routing and proved the correctness of a distributed implementation for it.
- Extended the scheme to support multiple traffic classes.

Nutshell: Proxy-Assisted Browsing in Cellular Networks

Dec 2016 – Oct 2017

Advisor: Prof. Sanjay Rao

Purdue, West Lafayette, IN

- Evaluated proxy-based redundant execution for low latency mobile pages.
- Reduced work load at proxies and analyzed the throughput and latency results.

Publications

1. Yanjun Wang, Zixuan Li, **Chuan Jiang**, Zixuan Li, Xiaokang Qiu and Sanjay Rao. "Comparative Synthesis: Learning Near-Optimal Network Designs by Query", **ACM SIGPLAN Symposium on Principles of Programming Languages (POPL)**, 2023.
2. **Chuan Jiang**, Zixuan Li, Sanjay Rao, and Mohit Tawarmalani. "Flexile: Meeting bandwidth objectives almost always", **ACM CONEXT**, 2022.
3. **Chuan Jiang**, Sanjay Rao, and Mohit Tawarmalani. "PCF: Provably Resilient Flexible Routing", pp. 139-153, **ACM SIGCOMM**, 2020.
4. Yiyang Chang, **Chuan Jiang**, Ashish Chandra, Sanjay Rao, Mohit Tawarmalani. "Lancet: Better network resilience by designing for pruned failure sets", pp.1-26, **ACM SIGMETRICS**, 2020.
5. Yanjun Wang, **Chuan Jiang**, Xiaokang Qiu, Sanjay G. Rao. "Learning Network Design Objectives Using A Program Synthesis Approach", pp. 69-76, **HotNets**, 2019.
6. Ashiwan Sivakumar, **Chuan Jiang**, Yun Seong Nam, Shankaranarayanan P N, Vijay Gopalakrishnan, Sanjay Rao, Subhabrata Sen, Mithuna Thottethodi, Vijaykumar T.N. "NutShell: Scalable Whittled Proxy Execution for Low-Latency Web over Cellular Networks", pp. 448-461, **ACM MOBICOM**, 2017.

Technical Skills

Computer Languages: C/C++, Python, Java, Golang

Database: MySQL

Tools: Gurobi, Matlab, Scikit-learn

SDN: Mininet, Open vSwitch

Awards and Recognitions

Anthony T. C. Gaw Fellowship, Purdue University

2021

NSDI 2018 Travel Grant

2018

Intern Award in Microsoft Research Asia

2015