Parth Thakkar

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EDUCATION

University of Illinois, Urbana-Champaign　　　　　　　　**Aug 2021 - May 2023**
MS in Computer Science
CGPA: 4.00
Graduate Research Assistant, Prof. Tianyin Xu,
Graduate Teaching Assistant, CS 411 Database Systems

National Institute of Technology, Trichy　　　　　　　　**Aug 2014 - May 2018**
B.Tech (Hons.) in Computer Science and Engineering
CGPA: 8.89

PUBLICATIONS

1. *Optimizing Network Provisioning through Cooperation*. **NSDI 2022**.
   H. Sharma*, **P. Thakkar***, S. Bharadwaj*, R. Bhagwan, V. Padmanabhan, Y. Bansal, V. Kumar, K. Voelbel (*Equal contributors)

2. *AutoSens: Inferring Latency Sensitivity of Users through Natural Experiments*. **ACM IMC 2021**.
   P. Thakkar, R. Saxena, V. Padmanabhan

3. *Scaling Hyperledger Fabric using Sparse Peers and Pipelined Execution*. **ACM SoCC 2021**.
   P. Thakkar & S. Nathan

4. *Performance Benchmarking and Optimizing Hyperledger Fabric Blockchain Platform*. IEEE MASCOTS 2018.
   P. Thakkar, S. Nathan, B. Vishwanathan (**Best Paper Award**)

EXPERIENCE

Meta, Menlo Park　　　　　　　　*May 2022 - Aug 2022*
SWE Intern | AI Training Privacy Enforcement

- Worked on automatically analyzing IO behavior of AI pipelines to improve privacy and transparency.
- Used Pyre and Buck to develop a scalable static analysis pipeline for Python projects and their dependencies.
- Trained an LLM-based classifier to identify if a function performs IO, obtained 80% accuracy.
- The project gained significant interest, and will be continued along my suggested extensions.

Microsoft Research, Bangalore　　　　　　　　*Jul 2019 - Jul 2021*
Research Fellow | Systems & Networking Group

- Worked on optimizing WAN bandwidth costs by leveraging first party setting.
- Proposed and implemented a mathematical framework for network provisioning and tested on Microsoft's production WAN.
- Savings in the order of tens of millions of dollars.
- Also worked on modelling the effect of latency on user engagement.

IBM Research, Bangalore　　　　　　　　*Jul 2018 - Jul 2019*
Research Engineer | Blockchain

- Improved performance, scalability & cost-efficiency of Hyperledger Fabric, IBM's Blockchain Platform.
- Introduced a parallelization technique to double CPU utilization and improve throughput by 40%.
- Introduced a sharding technique to make the system horizontally scalable.
- Introduced a mechanism to enable auto-scaling of nodes helping reduce provisioning costs.
- Improved overall throughput by $3.7\times$ and sped up scaling up time by 12-$26\times$.
- Led the project, and wrote a paper which got accepted at ACM SoCC 2021.

Research Intern | Blockchain   *May 2017 - Jul 2018*

o Performed the first ever rigorous performance study of Hyperledger Fabric.
o Wrote a generic, highly configurable & reusable load generator, which was used for further studies.
o Made 3 key optimizations that improved performance $16\times$ (from 140tps to 2250tps).
o Received Best Paper Award for the paper ([link](#)) published in IEEE MASCOTS describing the work.

Amazon, Chennai   *May 2016 - Jul 2016*
Software Engineering Intern | Backend

o Worked on backend stack for Amazon Tech Conf, where Echo devices act as help-desks & MoC's
o Built a fully serverless backend with NodeJS & AWS to power FireOS Apps, Alexa Skill & website
o Integrated it with internal systems & handled Ops of the whole system.

PROJECTS

Learning configuration validators for distributed systems   *Sep 2021 - present*
Advisors: Prof. Tianyin Xu, Prof. Madhusudan Parthasarathy | UIUC

o Given Configuration tests $T(Conf) \rightarrow Bool$ that check if a configuration is valid, we aim to generate validator formulas $V(Conf) \rightarrow Bool$ that mimic the test behaviour but are much cheaper to run.
o Working in a team to develop strategies to use dynamic analysis along with program synthesis techniques to learn the validators.

NL2CMD: Converting natural language instructions to Bash   *Oct 2021 - Dec 2021*
Term Project | Advisor: Prof. Heng Ji | UIUC

o Given natural language instructions, we generate bash commands that satisfy the user's intent.
o Attempting to model command *execution* for both verification and training of models.
o Working on a model to incorporate command descriptions in synthesizing commands.

Dalal Street   *Oct 2017 - Mar 2018*
Lead Developer | Delta-Force | [Github link](#)

o Led a team of 10 programmers to make a real-time virtual stock market game using Go, gRPC and React.
o Received a participation of over 1000+ players as part of Pragyan, Techfest of NIT Trichy.

KEY SKILLS

Languages	C++, Java, Python, GoLang, Typescript, Javascript, C, Bash, SQL
Tools & Tech	NodeJS, MongoDB, MySQL, AWS, Azure, Cosmos/Scope, NMon, Git, Pyre, Buck

AWARDS AND ACHIEVEMENTS

o ACM SoCC Student Scholarship (2021)
o JN Tata Endowment Scholarship (2020)
o **Best Paper Award** for "Performance Benchmarking & Optimizing Hyperledger Fabric Blockchain Platform" at MASCOTS 2018
o **2nd** in In-Out Hackathon, one of India's largest student-run hackathons (2016)

Talks

o Invited industry talk on "Optimizing the performance of Hyperledger Fabric Platform" at [ICDCN 2019](#)
o Conducted workshop on Introduction to Blockchain Systems as a part of Vortex 2018, NIT-T CSE Symposium

POSITIONS OF RESPONSIBILITIES

o **Delta Force:** *Program Manager at programming club of NIT-T. Lead several programming projects & conducted workshops for junior students and external colleges*
o **Pragyan:** *Manager of Web Operations for Pragyan, techno-management festival of NIT-T*