Suyash Gupta

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EDUCATION

University of California Davis — Davis, CA
Doctor of Philosophy — Jan 2018 – Dec 2021
GPA: 4.00/4.00

Purdue University — West Lafayette, IN
Master of Science — Aug 2015 – Dec 2017
GPA: 3.83/4.00

Indian Institute of Technology Madras — Chennai, India
Master of Science (Research) — Jan 2012 – May 2015
GPA: 8.57/10.00

GGSIP University — New Delhi, India
Bachelor of Technology — Aug 2007 – May 2011
GPA: 82.15/100

WORK EXPERIENCE

- **Postdoctoral Researcher, UC Berkeley** — Jan 2022 – present
  - **Advisor: Natacha Crooks**
  - Project – Efficient byzantine fault-tolerant communication and storage.
- **Lead Architect, ResilientDB** — Nov 2019 – present
  - Design and Maintenance of ResilientDB Permissioned Blockchain Fabric (formerly part of MokaBlox startup).
- **Research Assistant, UC Davis** — Jan 2018 – Dec 2021
  - **Advisor: Mohammad Sadoghi**
  - Project – Efficient Agreement Protocols
    - Design of two-phase non-blocking atomic commitment protocol.
    - Design of topology-aware commitment protocol for geographically distant nodes.
  - Project – Efficient Consensus Protocols and Resilient Architectures
    - Design of a speculative two-phase byzantine fault-tolerant consensus protocol.
    - Design of parallel and wait-free byzantine fault-tolerant consensus protocol.
    - Design of global-scale byzantine fault-tolerant consensus protocol.
    - Design and analysis of high-throughput yielding permissioned blockchains.
    - Design of secure and fault-tolerant serverless architectures.
    - Design of efficient byzantine fault-tolerant consensus protocols using SGX.
- **Research Intern, Novi (Libra/Facebook)** — June 2020 – Sep 2020
  - **Advisor: Dahlia Malkhi**
  - Automatic Profiling of Libra Framework
    - First work to automatically profile a blockchain system.
    - Integrating Coz profiler [SOSP'15] with Libra framework.
    - Bug detection during Libra compile time.
  - Analyzing Bottlenecks in Libra Framework
    - Discovered performance bottlenecks in Libra's implementation of Patricia-Merkle Tries used to store user data.
    - Found optimal place to parallelize Libra VM and Executor.
    - Detected performance bottleneck in Libra VM's prologue.
    - Trace analysis and annotation of Libra VM's load modules and resources.
- **Teaching Assistant, Purdue University** — Aug 2017 – Dec 2017

- **Research Assistant, Purdue University** Aug 2015 – Aug 2017
  - **Advisor: Suresh Jagannathan**
  - Project – Probabilistic Test Data Generation
    - Design of probabilistic test data generators that sample test inputs from various distributions such as Uniform, Binomial and Gaussian.
    - Extension of probabilistic test data generators implementation to recursive types such as lists and trees.
  - Project – Programming paradigms for distributed databases
    - Development of a DSL in Ruby on Rails that implements users view of consistency.
    - Implementation of a parser in Haskell that parses database SQL queries.
- **Intern, IBM India Research lab, New Delhi** Feb 2015 – Apr 2015
  - **Advisor: Mangla Gowri Nanda**
  - Project – Multithreaded Analysis of Java Programs
    - Study of a novel parallel escape analysis and pointer analysis algorithm.
    - Testing of a novel Java decompilation strategy.
    - Analysis of a novel Slicing algorithm.
- **Project Associate, IIT Madras** Jan 2014 – Dec 2014
  - **Advisor: V. Krishna Nandivada**
  - Project – Optimizing parallel programs for multicore systems.
    - Design of two novel task parallel optimizations for reduction of task creation and task termination operations.
    - Implementation of the two novel optimizations in X10 compiler.
    - Analyzing the impact of proposed optimizations on the energy consumption.
- **Teaching Assistant, IIT Madras** Jan 2012 — Dec 2013
- **Intern, Bharat Heavy Electical Limited** Jun 2010 – July 2010

PUBLICATIONS

Books

- **S. Gupta**, J. Hellings and M. Sadoghi, *Fault-tolerant Distributed Transactions on Blockchain*, **Morgan** & **Claypool Synthesis Lectures on Data Management**, 2021.

Conferences

- **S. Gupta**, M. J. Amiri and M. Sadoghi, *Chemistry behind Agreement*, In the Conference on Innovative Data Systems Research (**CIDR**), 2023.
- **S. Gupta**, S. Rahnama, E. Linsenmayer, F. Nawab, and M. Sadoghi, *Reliable Transactions in Serverless-Edge Architecture*, To appear in the Proceedings of 39th IEEE International Conference on Data Engineering (**ICDE**), 2023.
- S. Rahnama, **S. Gupta**, R. Sogani, D. Krishnan, Mnd . Sadoghi, *RingBFT: Resilient Consensus over Sharded Ring Topology*, In 25th International Conference of Extending Database Technology (**EDBT**), 2022.
- **S. Gupta**, J. Hellings, S. Rahnama and M. Sadoghi, *Proof-of-Execution: Reaching Consensus through Fault-Tolerant Speculation*, In 24th International Conference of Extending Database Technology (**EDBT**), 2021.
- **S. Gupta**, J. Hellings and M. Sadoghi, *RCC: Resilient Concurrent Consensus for High-Throughput Secure Transaction Processing*, In 37th IEEE International Conference on Data Engineering (**ICDE**). 2021.
- **S. Gupta**, S. Rahnama, J. Hellings and M. Sadoghi, *ResilientDB: Global Scale Resilient Blockchain Fabric*, In 46th International Conference on Very Large Databases (**VLDB**). 2020 — ***Artifact Evaluated***.
- **S. Gupta**, S. Rahnama and M. Sadoghi, *Permissioned Blockchain Through the Looking Glass: Architectural and Implementation Lessons Learned*, In 40th IEEE International Conference on Distributed Computing Systems (**ICDCS**). 2020.

- T. Qadah, **S. Gupta** and M. Sadoghi, *Q-Store: Distributed, Multi-partition Transactions via Queue-oriented Execution and Communication.* In 23rd International Conference of Extending Database Technology (**EDBT**), 2020.
- **S. Gupta**, J. Hellings and M. Sadoghi, *Brief Announcement: Revisiting Consensus Protocols through Wait-free Parallelization*, In 33rd International Symposium on Distributed Computing (**DISC**). 2019.
- **S. Gupta** and M. Sadoghi, *EasyCommit: A Non-blocking Two-phase Commit Protocol*, In 21st International Conference of Extending Database Technology (**EDBT**), 2018.
- **S. Gupta**, R. Shrivastava, and V. K. Nandivada, *Optimizing Recursive Task Parallel Programs*, In 31st International Conference on Supercomputing (**ICS**), 2017.

Journals

- **S. Gupta** and M. Sadoghi, *Efficient and non-blocking agreement protocols*, Distributed and Parallel Database (**DAPD**), 2019.
- **S. Gupta** and V. K. Nandivada, *IMSuite: A Benchmark Suite for Simulating Distributed Algorithms*, Journal of Parallel and Distributed Computing (**JPDC**), Elsevier, 2015.

Selected Articles

- **S. Gupta**, *Authenticated Concurrent Databases*, In International Workshop on High Performance Transaction Systems (**HPTS**), 2022
- **S. Gupta**, *Resilient and Scalable Architecture for Permissioned Blockchain Fabrics*, PhD Workshop, In 46th International Conference on Very Large Databases (**VLDB**), 2020.
- **S. Gupta**, J. Hellings, T. Qadah, S. Rahnama and M. Sadoghi, *Efficient Transaction Processing in Byzantine Fault Tolerant Environments*, In International Workshop on High Performance Transaction Systems (**HPTS**), 2019 – A Biennial Workshop.
- **S. Gupta** and M. Sadoghi, *Blockchain Transaction Processing*, In Encyclopedia of Big Data Technologies. Springer, Cham, 2018.

Tutorials

- **S. Gupta**, J. Hellings, S. Rahnama and M. Sadoghi,*Building High Throughput Permissioned Blockchain Fabrics: Challenges and Opportunities*, In 46th International Conference on Very Large Databases (**VLDB**), 2020.
- **S. Gupta**, J. Hellings, S. Rahnama and M. Sadoghi, *Blockchain consensus unraveled: Virtues and Limitations*, In 14th ACM International Conference on Distributed and Event-Based Systems (**DEBS**), 2020.
- **S. Gupta**, J. Hellings, S. Rahnama and M. Sadoghi, *An In-Depth Look of BFT Consensus in Blockchain: Challenges and Opportunities*, Middleware Tutorials, 2019.

Demonstrations

- S. Rahnama, **S. Gupta**, T. Qadah, J. Hellings and M. Sadoghi, *Scalable, Resilient and Configurable Permissioned Blockchain Fabric*, In 46th International Conference on Very Large Databases (**VLDB**), 2020.

OTHER RESOURCES

- ResilientDB Fabric, available online at `https://resilientdb.com/`. Source code is available at `https://github.com/resilientdb/resilientdb` and has been forked/starred more than 100 times.
- IMSuite benchmark, available online at `http://www.cse.iitm.ac.in/~krishna/imsuite` and has been downloaded over 5000 times and well-cited.
- DistCheck, a Litmus Testing tool, available online at `https://github.com/gupta-suyash/DistCheck`.

AWARDS & HONORS

- GGCS Best Graduate Researcher Award 2021.
- GGCS Travel Award 2021 from UC Davis to present paper at EDBT 2022.
- Student Grant from VLDB Endowment for participation in VLDB 2020.
- Student Travel Grant from Middleware 2019.
- GGCS Travel Award 2019 from UC Davis to attend HPTS 2019.
- Scholarship to attend VMW/CAV 2017 at Heidelberg, Germany.
- Travel grant to present paper at ICS 2017 at Chicago, IL.
- Accepted to attend OPLSS 2016 at Eugene, OR.
- Best Use of Data Visualization, Best Mobile App, Most Launchable product sponsored by Dorm Room Fund and PrincetonPy/PICSciE Prize at HackPrinceton 2016.
- First Prize at HackIllinois 2016 (Best Software Hack), and Best use of Microsoft Technology award – 19-21st February 2016.
- First at Purdue University and finalist entry to Windward Code Wars Spring 2016.
- Qualified for Semi-finals at Microsoft Imagine Cup Spring 2016.
- First Prize at Boston Hacks 2015 – 31st Oct – 1st Nov 2015.
- Scholarship to attend POPL/PLMW 2015, at Munbai, India.
- Outstanding Teaching Assistant Award for courses: CS3310 (Aug 12), CS6848 (Jan 13).
- Scholarship from MHRD, Government of India, for qualifying All India Graduate Aptitude Test in Engineering (GATE) and securing admission at IIT Madras.
- 1st prize, Inter College project competition, 2011, organized by GGSIPU and Delhi Knowledge Development Foundation
- 2nd prize, Technical Paper Presentation, 2011, organized in association of Computer Society of India (CSI) at Jamia Millia Islamia.
- 2nd prize at C/C++ programming at Info Expression 2009.

SERVICES

- **Reviewer:**
  - ICDE 2022, 2023
  - SIGMOD 2023
  - IEEE TPDS 2023
  - IEEE TKDE 2023
  - ACM DEBS 2023
  - Distributed and Parallel Databases (DAPD) 2021, 2022
  - IEEE BigData 2021, 2022
  - FAB 2022
  - ICDCS 2021
  - SIGMOD Record 2019
- **pVLDB Reproducibility** 2019 – present
- **Web Chair:** FAB 2021, 2022; Middleware 2019
- **Student Reviewer:** EuroSys 2022; JSys 2021
- **External Reviewer:** EDBT 2018; Middleware 2018.
- **Student Volunteer:** VLDB 2019.

MENTORING

- Shivang Singh, B.Sc, UC Berkeley (Jan 2022 - ongoing)
- Shreya Shekhar, B.Sc, UC Berkeley (Jan 2022 - ongoing)
- Aditya Ramkumar, B.Sc, UC Berkeley (Sep 2021 - ongoing)
- Ian Chang, B.Sc, UC Berkeley (Sep 2021 - Dec 2021)
- Kentaro Vadney, B.Sc, UC Berkeley (Sep 2021 - Dec 2021)
- Shubham Pandey, MS, UC Davis (June 2020 - June 2021) – Now at Cisco, Bay Area

- Erik Linsenmayer, B.Sc, UC Davis (June 2020 - June 2021) – Now at DIII-D National Fusion Facility
- Alex Su, B.Sc, UC Davis (June 2020 - Dec 2020)
- Rohan Sogani, MS, UC Davis (Jan 2020 - Dec 2020) – Now at Amazon, Seattle
- Priya Holani, MS, UC Davis (Jan 2020 - Aug 2020) – Now at Amazon, Seattle
- Dhruv Krishnan, MS, UC Davis (Jan 2020 - Aug 2020) – Now at Amazon, Seattle
- Xinyuan Sun, B.Sc, UC Davis (Jan 2020 - Aug 2020)
- Federico Mengozzi, B.Sc, UC Davis (Sep 2018 - June 2019) – Now at Carsbarter, Murcia
- Shreenath Iyer, MS, UC Davis (Sep 2018 - June 2019) – Now at Amazon, Seattle
- Romen Rubero, B.Sc, UC Davis (Sep 2018 - June 2019) – Now at Carsbarter, Murcia
- Patrick J. Liao, B.Sc, UC Davis (Jan 2018 - Dec 2018) – Now at Juniper Technology
- Domenic Cianfichi, MS, UC Davis (Jan 2018 - Aug 2018)

SEMINARS / TALKS

- *Resilient and Scalable Architecture for Permissioned Blockchain Fabrics* at IIT Madras on 04/30/2021.
- *Resilient and Scalable Architecture for Permissioned Blockchain Fabrics* at Faisal Nawab's Course, UC Irvine on 04/26/2021.
- *Resilient and Scalable Architecture for Permissioned Blockchain Fabrics* at SRG Student Seminar, UMich on 03/25/2021.
- *Resilient and Scalable Architecture for Permissioned Blockchain Fabrics* at RISELab, UC Berkeley on 03/12/2021.
- *Resilient and Scalable Architecture for Permissioned Blockchain Fabrics* at Novi Research Seminars on 01/28/2021.
- *Resilient Consensus for High-Throughput Secure Transaction Processing* at Elaine Shi's Research Group, CMU on 12/17/2020
- *RCC: Resilient Concurrent Consensus for High-Throughput Secure Transaction Processing* at Novi Intern Seminars on 08/17/2020.
- *ResilientDB: Global Scale Resilient Blockchain Fabric* at VLDB'20 on 09/01/2020 and 09/03/2020 (recorded video).
- *Building High Throughput Permissioned Blockchain Fabrics: Challenges and Opportunities* at VLDB'20 on 09/01/2020 (recorded video).
- *Resilient and Scalable Architecture for Permissioned Blockchain Fabrics* at PhD Workshop, VLDB'20 on 08/31/2020 (recorded video).
- *Blockchain consensus unraveled: Virtues and Limitations* at DEBS'20 on 07/14/2020.
- *An In-Depth Look of BFT Consensus in Blockchain: Challenges and Opportunities* at REIMAGINE v1.0 on 12/10/2019.
- *ResilientDB: Global Scale Resilient Blockchain Fabric* at FAB'20 on 05/01/2020 (recorded video).
- *Permissioned Blockchain Through the Looking Glass: Architectural and Implementation Lessons Learned* at FAB'20 on 05/01/2020 (recorded video).
- *An In-Depth Look of BFT Consensus in Blockchain: Challenges and Opportunities* at Middleware on 12/10/2019.
- *EasyCommit: A non-blocking two-phase commit protocol* at EDBT'18 on 03/29/2018.
- *Optimizing recursive task parallel programs* at ICS'17 on 06/14/2017.
- *IMSuite: A benchmark suite for simulating distributed algorithms* at Purdue University on 09/15/2016.
- *Analyzing Recursive Task Parallel Programs* at Indian Institute of Technology Madras on 10/16/2014.