Suyash Gupta

Lab 2392, Academic Surge, University of California, Davis CA 95616 • sugupta@ucdavis.edu
gupta-suyash.github.io
Github: https://github.com/gupta-suyash • Skype: gupta.suyash

EDUCATION

University of California Davis Davis, CA
Doctor of Philosophy Jan 2018 – present
(Transfer from Purdue)
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

- **Research Assistant, University of California, Davis** Jan 2018 – present
  - 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 RDMA.

- **Research Intern, Novi (Libra/Facebook)** June 2020 – Sep 2020
  - 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.

- **Lead Architect, MokaBlox (Startup)** Nov 2019 – present
  - Design and Maintenance of ResilientDB Permissioned Blockchain Fabric.

- **Teaching Assistant, Purdue University** Aug 2017 – Dec 2017
- **Research Assistant, Purdue University** Aug 2015 – Aug 2017
  - 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
  - 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
  - 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 (to appear), 2020.

Conferences

- **S. Gupta**, J. Hellings and M. Sadoghi, *RCC: Resilient Concurrent Consensus for High-Throughput Secure Transaction Processing*, To appear in 37th IEEE International Conference on Data Engineering (ICDE). 2021.
- **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.
- **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**.
- 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**, *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.

Pre-Prints (Under Submission)

- **S. Gupta**, J. Hellings and M. Sadoghi, *Proof-of-Execution: Reaching Consensus through Fault-Tolerant Speculation*, available on Arxiv, 2019.

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 60 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

- Student Grant from VLDB Endowment for participation in VLDB 2020.
- Student Travel Grants from Middleware 2019.
- GGCS Travel Award 2019 from UC Davis to attend HPTS 2019.
- Scholarship to attend VMW/CAV 2017 at Heidelberg, Germany, 23 – 28 July 2017.
- Travel grant to present work at ICS 2017 at Chicago, IL, 14 – 16th June 2017.
- Attended OPLSS'16 at Eugene, OR, 19th June 2016 – 2nd July 2016.
- 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, at Munbai, India, 12 – 18 Jan 2015.
- 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.

SEMINARS / TALKS

- *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.

SERVICES

- Reviewer, ICDCS 2021
- pVLDB Reproducibility 2019 – present
- Reviewer, SIGMOD Record 2019
- Web Chair, Middleware 2019.
- Volunteer, VLDB 2019.
- External Reviewer, EDBT 2018.
- External Reviewer, Middleware 2018.

MENTORING

- Alex Su, B.Sc, UC Davis (Summer 2020 - ongoing)
  - Project: Byzantine Resilient Serverless Framework.

- Shubham Pandey, MS, UC Davis (Summer 2020 - ongoing)
  - Project: Efficient Byzantine Consensus using RDMA.

- Erik Linsenmayer, B.Sc, UC Davis (Spring 2020 - ongoing)

- – Project: Byzantine Resilient Serverless Framework.
- Rohan Sogani, MS, UC Davis (Winter 2020 - ongoing)
  - – Project: Efficient Byzantine Fault-Tolerant consensus through Sharding.
- Priya Holani, MS, UC Davis (Winter 2020 - Summer 2020)
  - – Project: Efficient Byzantine Fault-Tolerant consensus through Sharding.
- Dhruv Krishnan, MS, UC Davis (Winter 2020 - Summer 2020)
  - – Project: Efficient Byzantine Fault-Tolerant consensus through Sharding.
- Xinyuan Sun, B.Sc, UC Davis (Winter 2020 - Summer 2020)
  - – Project: Efficient Byzantine Consensus using RDMA.
- Federico Mengozzi, B.Sc, UC Davis (Fall 2018 - Fall 2019) – Now at Carsbarter, Murcia
  - – Project: Smart Contracts support in ResilientDB.
- Shreenath Iyer, MS, UC Davis (2018-2019) – Now at Amazon, Seattle
  - – Project: Data Visualization Support for ResilientDB Fabric.
- Romen Rubero, B.Sc, UC Davis (Fall 2018 - Spring 2019) – Now at Carsbarter, Murcia
  - – Project: Crypto Profiling/Benchmarking in ResilientDB Fabric.
- Patrick J. Liao, B.Sc, UC Davis (Winter 2018 - Fall 2018) – Now at Juniper Technology, Bay Area
  - – Project: Robust Byzantine Fault-Tolerant Protocols in ResilientDB.
- Domenic Cianfichi, MS, UC Davis (Winter 2018 - Summer 2018)
  - – Project: Fault-tolerant Consensus Protocols in ResilientDB.