

Balaji Arun

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Education

Virginia Polytechnic Institute and State University (Virginia Tech) 2015 – 2021

Ph.D. in Computer Engineering (GPA: 3.9/4.0)

Advisor: Prof. Binoy Ravindran

Dissertation: Scalable Byzantine State Machine Replication

Virginia Polytechnic Institute and State University (Virginia Tech) 2015 – 2017

M.S. in Computer Engineering (GPA: 4.0/4.0)

Advisor: Prof. Binoy Ravindran

Thesis: A Low-latency Consensus Algorithm for Geographically Distributed Systems

Virginia Polytechnic Institute and State University (Virginia Tech) 2013 – 2015

B.S. in Computer Engineering, *Summa Cum Laude* (GPA: 3.83/4.0)

Experience

LinkedIn Corporation

Site Reliability Engineer

Apr. 2021 – Present

- Contributor on Product Experience Monitoring platform team that measures the experiences of millions of members with various LinkedIn products.
- Design and implement systems that gather experience analytics information from millions of user-facing apps.
- Optimize stream processing system to enable processing millions of events per second to facilitate real-time insights into member experiences.
- Provide guidance on developing high-performance concurrent systems to peers.
- Tackle technical challenges and contribute to development on a daily basis.
- Provide oncall support to consumers and ensure 24/7 availability of the platform.

Virginia Tech

Graduate Research Assistant

Aug. 2017 – Apr. 2021

- Research Assistant in the System Software Research Group.
- Project: Scalable Byzantine State Machine Replication
 - Design of low-latency Byzantine fault-tolerant consensus protocol.
 - Design of low-latency Hybrid fault-tolerant consensus protocol.
 - Design of globally scalable Byzantine fault-tolerant consensus protocol.
 - Design of high-performance, globally scalable Hybrid fault-tolerant consensus protocol.
 - Design of dual fault-tolerant consensus protocol with resilience and efficiency tradeoffs.
 - Techniques for transforming crash fault-tolerant consensus protocols to tolerate Byzantine faults
 - Design of low-latency Byzantine ordered consensus protocol.

Virginia Tech

Graduate Teaching Assistant

- o Teaching Assistant for Multiprocessor Programming (Graduate-level) course during the Fall 2016, 2017 and 2019 semesters.
- o Teaching Assistant for Applied Software Design (Junior-level) course during the Spring 2016 semester.
- o Designed course assignments and projects, evaluated student submissions, conducted hands-on lab classes, and held weekly office hours.

LinkedIn Corporation

Site Reliability Engineering Intern

May. 2018 – Aug. 2018

- o Developed the first version of Scattershot, a distributed log indexing and searching system with live-streaming support.
- o Designed and implemented a high-performance dashboard for live-streaming thousands of log events per second directly from production hosts.
- o Marketed the product to various internal teams and on-boarded the early adopters of the product.

Facebook Inc.

Production Engineering Intern

May. 2017 – Aug. 2017

- o Designed and implemented a regression testing framework for Warm Storage, Facebook's data warehouse storage system.
- o Identified and fixed scalability issues in multiple critical micro-services that impacted production using the framework.
- o Integrated the testing suite as part of the continuous integration pipeline.

Virginia Tech

Graduate Research Assistant

Sep. 2015 – May. 2017

- o Research Assistant in the System Software Research Group.
- o Project: Low-latency Consensus Algorithms for Geographically Replicated Systems
 - Design of low-latency, leaderless crash fault-tolerant consensus protocol for geographically replicated system.
 - Design of consensus framework to tame workload contention in distributed systems by leveraging multiple consensus protocols.

Publications

- [1] **B. Arun** and B. Ravindran. DuoBFT: Resilience vs. Efficiency Trade-off in Byzantine Fault Tolerance. *CoRR*, abs/2010.01387, 2020.
- [2] **B. Arun**, S. Peluso, R. Palmieri, G. Losa, and B. Ravindran. Taming the Contention in Consensus-based Distributed Systems. *IEEE Transactions on Dependable and Secure Computing*, 2020.
- [3] M. Garg, S. Peluso, **B. Arun**, and B. Ravindran. Generalized Consensus for Practical Fault Tolerance. In *Proceedings of the 20th International Middleware Conference*, Middleware '19, page 55–67, New York, NY, USA, 2019. Association for Computing Machinery.
- [4] **B. Arun**, S. Peluso, and B. Ravindran. ezBFT: Decentralizing Byzantine Fault-Tolerant

State Machine Replication. In *2019 IEEE 39th International Conference on Distributed Computing Systems (ICDCS)*, pages 565–577, July 2019.

- [5] **B. Arun**, S. Peluso, R. Palmieri, G. Losa, and B. Ravindran. Speeding up consensus by chasing fast decisions. In *2017 47th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, pages 49–60, 2017.
- [6] **B. Arun**, S. Hirve, R. Palmieri, S. Peluso, and B. Ravindran. Speculative Client Execution in Deferred Update Replication. In *Proceedings of the 9th Workshop on Middleware for Next Generation Internet Computing, MW4NG '14*, New York, NY, USA, 2014. Association for Computing Machinery.

Talks

- Speeding up Consensus by Chasing Fast Decisions *DSN 2017*
- Speeding up Consensus by Chasing Fast Decisions *Air Force OSR SRD 2017*
- ezBFT: Decentralizing Byzantine Fault-Tolerant State Machine Replication *ICDCS 2019*
- Leaderless Consensus *Data Skeptic Podcast*

Professional Activities

- Reviewer, ACM Principles and Practice of Parallel Programming *PPoPP 2022*
- Sub-reviewer, Conference on Distributed Computing and Intelligent Technology *ICDCIT 2022*
- Sub-reviewer, Symposium on Stabilization, Safety, and Security of Dis. Systems *SSS 2020*
- Shadow Program Committee, Eurosys *Eurosys 2020*
- Reviewer, IEEE Transactions on Dependable and Secure Computing *TDSC 2020*
- External Reviewer, IEEE Conference on Dependable Systems and Networks *DSN 2020*
- Sub-reviewer, International Conference on Principles of Distributed Systems *OPODIS 2019*
- Sub-reviewer, International Symposium on Distributed Computing *DISC 2019*
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