Arun George Zachariah

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EDUCATION

University of Missouri-Columbia
Ph.D., Computer Science (Transferred)   Spring 2020 – Summer 2022 (Expected)
Advisor: Dr. Praveen Rao

University of Missouri-Kansas City
Interdisciplinary Ph.D., Computer Science   Fall 2018 – Fall 2019
Advisor: Dr. Praveen Rao

Cochin University of Science and Technology
Bachelor of Technology, Electrical and Electronics Engineering   2008 – 2012

PUBLICATIONS

Arun Zachariah, Praveen Rao, Brian Corn, and Dominique Davison - Zero Shot Learning for Predicting Energy Usage of Buildings in Sustainable Design. In AAAI Workshop on AI to Accelerate Science and Engineering (AI2ASE), 4 pages, Canada, 2022. (To Appear)

Arun Zachariah, Maha Alrasheed – "Private-Share: A Secure and Privacy-Preserving De-Centralized Framework for Large Scale Data Sharing". In Proc. of the *3rd ACM International Conference on Multimedia in Asia* (ACM MM Asia 2021), 3 pages, Australia, 2021 (To Appear)

Praveen Rao, **Arun Zachariah**, Deepthi Rao, Peter Tonellato, Wesley Warren and Eduardo Simoes - "Accelerating Variant Calling on Human Genomes Using a Commodity Cluster". In the *30th ACM International Conference on Information and Knowledge Management* (CIKM), pages 3388-3392, Australia, 2021 (Nominated for Best Short Paper Award)

Suveen Angraal, **Arun Zachariah**, Raaisa Raaisa, Rohan Khera, Praveen Rao, Harlan M Krumholz, and John A Spertus – "Evaluation of Internet-based Crowdsourced Fundraising to Cover Healthcare Costs in the United States". In *JAMA Network Open*, 4(1), 2021

Arun Zachariah, Mohamed Gharibi, Praveen Rao – "A Large-Scale Image Retrieval System for Everyday Scenes". In Proc. of the *2nd ACM International Conference on Multimedia in Asia* (ACM MM Asia 2020), 3 pages, Singapore, 2021

Nouf Alrasheed, **Arun Zachariah**, Shivika Prasanna, Deepthi Rao, and Praveen Rao. "Deepfakes for Histopathology Images: A Myth or Reality?" In *49th Annual IEEE Applied Imagery Pattern Recognition (AIPR) Workshop 2020: Trusted Computing, Privacy, and Securing Multimedia*, pages 1-7, Washington, D.C., 2020

Arun Zachariah, Mohamed Gharibi, Praveen Rao – "QIK: A System for Large-Scale Image Retrieval on Everyday Scenes with Common Objects". In the *10th International Conference on Multimedia Retrieval* (ICMR 2020), pages 126-135, Dublin, Ireland, 2020

Mohamed Gharibi, **Arun Zachariah** and Praveen Rao – "FoodKG: A Tool to Enrich Knowledge Using Machine Learning Techniques". In *Frontiers in Big Data*, Volume 3, 12 pages, 2020

Daniel E. Lopez Barron, Praveen Rao, Deepthi Rao, Ossama Tawfik, **Arun Zachariah** – "Large-Scale Storage of Whole Slide Images and Fast Retrieval of Tiles Using DRAM". In *2020 SPIE Defense + Commercial Sensing: Big Data II: Learning, Analytics, and Applications Conference* (11395), 6 pages, Anaheim, CA, 2020

Arun Zachariah, Praveen Rao, Anas Katib, Monica Senapati, Kobus Barnard – "A Gossip-Based System for Fast Approximate Score Computation in Multinomial Bayesian Networks". In the *35th IEEE International Conference on Data Engineering* (ICDE), pages 1968-197, Macau, China, 2019

DATASETS

Praveen Rao, **Arun Zachariah**, Deepthi Rao, Peter Tonellato, Wesley Warren, Eduardo Simoes, February 27, 2021, "Variant Analysis of Human Genome Sequences for COVID-19 Research", IEEE Dataport, doi: https://dx.doi.org/10.21227/b0ph-s175.

PROFESSIONAL EXPERIENCE

Graduate Research Assistant

University of Missouri-Columbia   02/2020 – Present
University of Missouri-Kansas City   09/2018 – 01/2020

Responsibilities
- Develop a system to enable democratizing genome sequence analysis on CloudLab as a part of NSF-RAPID (CNS-2034247) and MU Center for Biomedical Informatics.
- Develop a deep learning model to predict energy usage metrics of buildings by considering a large number of building parameters, as a part of the NSF Center for Big Learning (CNS-1747751).
- Develop and test a large-scale image retrieval system as a part of the NSF Center for Big Learning(CNS-1747751).
- Develop a scalable system for storage and fast retrieval of Whole Slide Images, for enabling next generation image analytics, as a part of the NSF I-Crops program.
- High-performance networking with RDMA and DPDK to enable lightning-fast storage and retrieval.
- Collect, process, and analyze data from various sources using complex techniques and procedures as required, to help prepare grant proposals or funding applications.
- Conduct customer discovery interviews, as a part of the NSF I-Crops program, to understand industry requirements and challenges.
- Supervise students working on research projects.
- Perform other duties as assigned by the supervisor.

Intern, Engineering

Arm Ltd.   06/2021 – 08/2021

Responsibilities
- Analyze code to identify bottlenecks across software, micro-architecture, and architecture.
- Perform extensive experiments on real and simulated platforms.
- Develop innovative tools for architectural exploration and performance analysis.
- Autonomously queue and execute benchmarks on a pool of machines from MAAS and AWS with Ansible and Juju.

Technology Analyst

Infosys (Consultant at Apple Inc.)   05/2013 – 08/2018

Achievements

- Implemented innovative systems for data collection, storage and management of customer data.
- Built a custom product for Customer person data standardization, matching, de-duplication, linking and feeding to enterprise data warehouse systems.
- Successfully set up Hadoop over multiple nodes and migrated data from Oracle 10g to HBase using Sqoop.
- Designed and implemented a locking and buffering mechanism using an in-memory database, resulting in a 10 times increase in processing bandwidth with the same hardware configuration.
- Transformed regular Normalized RDBMS apps to De-Normalized structure for scaling and improved response times from 200-300ms to 20-30ms.

Responsibilities

- Translate business goals and customer needs into prioritized product requirements and use cases.
- Application tuning – JVM Performance tuning, Database tuning, Profiling, Capacity planning and health check monitoring during peak business days.
- Develop multiple MapReduce jobs in for data cleaning and pre-processing.
- Writing Hive queries to read from HBase.
- Identify new technologies and tools for enhancing product value and increasing team productivity.
- Train, mentor and manage a team of software engineers.

TECHNICAL SKILLS

- Programming Languages: C, C++, Java, Python, Scala, Gremlin
- J2EE Technologies: Servlets, JSP, Web Services
- Web Technologies: HTML5, Javascript, jQuery, Angular JS
- Database Technologies: SQL, SPARQL, Mongo DB, PostgreSQL, Greenplum, MySQL, TinkerPop, Neo4j
- Software Libraries & Tools: PyTorch, TensorFlow, Keras, Caffe, OpenCV, scikit-learn, SciPy, pandas, NumPy, Hadoop, Spark, Hive, Kafka, HBase, genism, Deepwalk
- Version Control Tools: GIT, SVN
- Build Tools: Ant, Maven, Gradle, sbt

ACADEMIC SERVICES

External Reviewer

- NeurIPS Workshop on Human and Machine Decisions   2021
- 23rd International Conference on Big Data Analytics and Knowledge Discovery   2021
- 30th International Conference on Computer Communications and Networks   2021
- 4th International Conference on Connected and Autonomous Driving (MetroCAD)   2021
- Cluster Computing Journal – Springer   2020
- 8th International Conference on Big data and Cloud Computing   2020
- 8th IEEE International Conference on Healthcare Informatics   2020
- 25th International Conference on Pattern Recognition   2020
- 22nd International Conference on Big Data Analytics and Knowledge Discovery   2020
- 21st IEEE International Conference on Mobile Data Management   2020
- 32nd Conference on Graphics, Patterns and Images SIBGRAPI   2019

- 7th International Conference on Big data and Cloud Computing   2019
- 21st International Conference on Big Data Analytics and Knowledge Discovery   2019

Conference Workshops Conducted
- Fundamentals of Deep Learning for Computer Vision   ICBCC 2019

Student Volunteer
- 35th Conference on Neural Information Processing Systems (NeurIPS)   2021
- 34th Conference on Neural Information Processing Systems (NeurIPS)   2020
- 7th International Conference on Big data and Cloud Computing   2019
- Deep Learning Fundamentals for Computer Vision.   2019

AWARDS AND GRANTS

- Upsilon Pi Epsilon Scholarship Award   2021
- ACM SIGMM Travel Grant   2021
- VLDB SPEND grant   2021
- MU Graduate Professional Council Research Development Award.   2021
- 34th NeurIPS Student Volunteer Registration   2020
- UMKC School of Graduate Studies Travel Grant   2019
- Student Activity Fee Committee Travel Grant   2019
- CSEE Balaji Krithikaivasan Memorial Travel Grant   2019
- IEEE Standards Education Grant   2012