Jayaram K Radhakrishnan

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EXPERIENCE

IBM Research AI Mar 2016 – present
Technical Lead and Research Staff Member Yorktown Heights, NY, USA

Leading the following projects:

- Serverless Federated Learning – Scalable and resource efficient model aggregation using serverless platforms. (2021)
- Privacy Preserving Federated Learning using (i) homomorphic encryption and (ii) parameter/gradient shuffling and trusted execution environments (AMD SEV) (2020-21, IBM FL product)
- Elastic scaling of Deep Learning Training Jobs (2019, IBM Watson DLaaS product)
- Scalable Lifecycle Management (deployment, scheduling, monitoring, resiliency and fault tolerance) of deep learning jobs in IBM DLaaS. (2017-18, IBM Watson DLaaS product)
- Causality Analysis of distributed systems for elastic scaling (2016-17, IBM SoftLayer IaaS)
- Filed 9 patent applications, published 13 papers, recognized with 2 IBM Outstanding Technical Achievement Awards

IBM Research (Hybrid Cloud Research) Feb 2014 – Feb 2016
Research Staff Member Yorktown Heights, NY, USA

Major contributor to the following projects:

- Trustworthy Geographically Fenced Cloud Platforms: Integration of scalable hardware-rooted (TPM) host, guest OS and application integrity verification and geographic fencing mechanisms into Softlayer IaaS cloud.
- Trustworthy Analytics: Extension of integrity verification, geo-fencing and controlled decryption to analytics platforms (Hadoop and Spark).
- Filed 2 patent applications, published 5 papers

HP Labs June 2012 – Jan 2014
Postdoctoral Researcher Palo Alto, CA, USA

- Invented ElasticRMI – An extension to Java RMI to dynamically increase the number of server objects available to handle remote method calls. Instead of instantiating a single remote object, ElasticRMI creates an object pool and load balances method calls among objects in the pool.
- Event Correlation for Intrusion Detection – Worked on the design and implementation of a large-scale rule-based datacenter intrusion detection system for HP ArcSight where rules and correlation patterns are dynamic, i.e., stateful.
- Concerto – Worked on large scale transactional graph storage
- Published 3 papers and filed a patent

Lucent Technologies June 2004 – May 2005
Software Engineer Bangalore, India

- Designed and developed modules for the Optical Network Management (ONM)Team

EDUCATION

Purdue University June 2012
Ph.D, Computer Science. Advisor: Patrick Eugster West Lafayette, IN, USA

Purdue University Dec 2008
M.S., Computer Science West Lafayette, IN, USA

BITS Pilani May 2004
B.E., Computer Science Pilani, Rajasthan, India

Awards and Recognition

- IBM Outstanding Technical Achievement Award : Enterprise Strength Federated Learning
- IBM Outstanding Technical Achievement Award : Deep Learning as a Service (DLaaS)
- IBM Plateau Invention Achievement Award (3 times)
- Manager's Choice Award (2 times, 2017, 2021)
- ACM MIDDLEWARE 2013 Best Paper Award
- Purdue Computer Science Maurice H. Halstead Award for Outstanding PhD Research
- ACM MIDDLEWARE 2010 Best Paper Award

Selected Publications

Full list, pdfs and author info, etc. at `www.jayaramkr.com`. DBLP: `https://dblp.org/pid/21/2983.html`. I publish as K. R. Jayaram.

- Separation of Powers in Federated Learning. preprint. 2021
- BM Federated Learning: an Enterprise Framework. (White Paper). 2020
- MYSTIKO: Cloud-Mediated, Private, Federated Gradient Descent. IEEE CLOUD 2020
- Effective Elastic Scaling of Deep Learning Workloads. IEEE MASCOTS 2020
- FfDL: A Flexible Multi-tenant Deep Learning Platform. MIDDLEWARE 2019
- Dependability in a Multi-tenant Multi-framework Deep Learning as-a-Service Platform. DSN Industry 2018
- IBM Deep Learning Service, 2017
- Scalable, Efficient Anonymization with INCOGNITO - Framework & Algorithm, BigData 2017
- Exploiting Causality to Engineer Elastic Distributed Software. ICDCS 2016
- Subscription Normalization for Effective Content-Based Messaging. IEEE Trans. on Parallel and Distributed Systems, 2015
- Trustworthy geographically fenced hybrid clouds. MIDDLEWARE 2014
- Parametric Content-Based Publish/Subscribe. MIDDLEWARE 2010 Best Paper, ACM Trans. Computer Systems, 2013
- Elastic Remote Methods. MIDDLEWARE 2013
- Views and Transactional Storage for Large Graphs. MIDDLEWARE 2013 Best Paper
- Program analysis for event-based distributed systems. DEBS 2011
- Split and Subsume: Subscription Normalization for Effective Content-Based Messaging. ICDCS 2011
- FAIDECS: Fair Decentralized Event Correlation. MIDDLEWARE 2011, ACM Trans. Internet Technology 2015
- EventJava: An Extension of Java for Event Correlation. ECOOP 2009

Service

- Volunteer, incharge of IT, Westchester COVID-19 Vaccination Camp. WMCHealth and NY Dep. of Health.
- General Chair, MIDDLEWARE 2017. Industry Program Chair, ACSOS 2020&21, MIDDLEWARE 2015.
- Program Committee Member. AAAI 2021, NeurIPS 2020, WWW 2020, ICDCS (2022, 2016, 2015, 2013), MIDDLEWARE (2021, 2020, 2019, 2018, 2014), DAIS (2016, 2015, 2014), IC2E (2016, 2014), ICAC 2015