

# Sai Charan, Koduru

*Autodidactic polyglot, hacker, thinker and researcher.*

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## EXPERIENCE

- Senior Software Engineer, Microsoft. Sep 2017 – present
- Software Engineer II, Microsoft. Oct 2015 – Aug 2017
- Research Assistant, University of California, Riverside. Mar 2011 – Sep 2015
- Researcher (Intern), Microsoft. Jun 2014 – Sep 2014
- Researcher (Intern), Microsoft. Jun 2013 – Sep 2013
- Senior Software Engineer, Yahoo! Inc. Jul 2010 – Feb 2011
- R&D Software Engineer, Nokia. Apr 2008 – Jun 2010

## INTERESTS & EXPERTISE

- Compiler and language support for Parallel, Multi-core, Distributed and GPU programming; performance tuning, run-time monitoring & tuning of parallel systems. Size Oblivious Programming. Distributed Software Speculation. Hadoop, Hive, HDFS, JNI; Dynamic programming languages & Cryptography.

## EDUCATION

- Ph.D., Computer Science, [University of California, Riverside](http://www.ucr.edu). Advisor: Prof. Rajiv Gupta. Mar '11 – Sep '15
- M.Tech., Computer Science, *Summa Cum Laude*, [Sri Sathya Sai University](http://www.sathyasaiversity.com), India. 2008
- M.Sc., Math & Computer Science, *Summa Cum Laude*, [Sri Sathya Sai University](http://www.sathyasaiversity.com), India. 2006
- B.Sc.(Honors), Math, *Summa Cum Laude*, [Sri Sathya Sai Institute of Higher Learning](http://www.sathyasaiversity.com), India. 2004

## PUBLICATIONS

- *Out-of-Core MapReduce for Large Data Sets* Under Review.
- *Software Speculation on Caching DSMs*, Sai Charan Koduru, Keval Vora, Rajiv Gupta, Intl' Journal of Parallel Processing (IJPP) 04 April 2017.
- *Size Oblivious Programming with Infinimem*, Sai Charan Koduru, Iulian Neamtiu, Rajiv Gupta, The 28<sup>th</sup> Intl Workshop on Languages and Compilers for Parallel Computing (LCPC 2015) 09-11 September 2015.
- [Book Chapter] *Size Oblivious Programming with Infinimem*, Sai Charan Koduru, Iulian Neamtiu, Rajiv Gupta, Lecture Notes in Computer Science (LNCS) 9519, Chapter 1, Pages 1 – 21. In publication.
- *Optimizing Caching DSM for Distributed Software Speculation*, Sai Charan Koduru, Keval Vora, Rajiv Gupta, IEEE International Conference on Cluster Computing 2015 (Cluster 2015) 08-11 September 2015.
- *ASPIRE: Exploiting Asynchronous Parallelism in Iterative Algorithms using a Relaxed Consistency based DSM*, Keval Vora, Sai Charan Koduru, Rajiv Gupta, ACM SIGPLAN International Conference on Object Oriented Programming Systems, Languages and Applications (OOPSLA 2014) 20-24 October 2014.
- *ABC<sup>2</sup>: Adaptively Balancing Computation & Communication in a DSM cluster of Multicores for Irregular Applications*, Sai Charan Koduru, Keval Vora, Rajiv Gupta, IPDPSW, High-Level Parallel Programming Models and Supportive Environments (HIPS 2014). 19<sup>th</sup> May '14
- *Programming Large Dynamic Data Structures on a DSM Cluster of Multicores*, Sai Charan Koduru, Min Feng, Rajiv Gupta, 7th International Conference on PGAS Programming Models (PGAS 2013). 3<sup>rd</sup> – 4<sup>th</sup> Oct '13
- *An Empirical Analysis of the Bug-fixing Process in Open Source Android Apps*, Pamela Bhattacharya, Liudmila Ulanova, Iulian Neamtiu, and Sai Charan Koduru, 17th European Conference on Software Maintenance and Reengineering (CSMR 2013). March 5<sup>th</sup> – 8<sup>th</sup> 2013
- *N-Dimensional Baker Maps for Chaos Based Image Encryption*, Sai Charan & V. Chandrasekaran, Proceedings of IEEE ICETiC 2009, pp 31-34 (Oral track). January 8<sup>th</sup> – 10<sup>th</sup> 2009

- *Random-Walk based Baker maps for Chaos Based Image Encryption*, Sai Charan & V. Chandrasekaran, IPCV 2008 Monte Carlo Resort, Las Vegas, Nevada, USA. [IPCV 2008](#)). July 14<sup>th</sup> – 17<sup>th</sup> 2008
- *Integrated Confusion-Diffusion Mechanisms for Chaos Based Image Encryption*, Sai Charan & V. Chandrasekaran, IEEE CIT 2008, Sydney, Australia ( [IEEE CIT 2008](#)). July 8<sup>th</sup> – 11<sup>th</sup> 2008
- *A Block DCT Based Optical Character Recognition System*, Sai Charan & G.V. Prabhakar Rao, Poster Presented at International Conference: NexGen IT for Societal Advancement & Integration, Prashanthi Nilayam, India. July 15<sup>th</sup> – 17<sup>th</sup> 2006
- Invited article for Nokia internal blog: 'WrechScience', on development tools and practices.

## SERVICE

- *Reviewer/External Reviewer* [IET, Signal Processing](#) (cryptography track), [Elsevier's ParCo](#), [IPDPS 2014](#), [IEEE MICRO 2012](#), PLDI 2014, IPDPS 2013, ICSME 2014, CCGrid 2015, CASES 2011, 2014, SAMOS 2014, RTSCA 2013, LCTES 2013, ICPADS 2013, 2014, 2015, RV 2011, APLAS 2011.
- *Research Mentoring* Supervised M.Tech.(CS) students' research projects and course work at my *Alma Mater*.
- *System & Network Administration* Four years experience as lead system & network administrator for Windows and Linux systems & student webmaster, DMACS (Department of Mathematics & Computer Science), SSSU. Designed & implemented Active Directory Services on Windows Server 2003 for DMACS, SSSU.
- *Dev Forum* Organized bi-monthly Dev Forum at Nokia to discuss and solve interesting problems/issues.
- *Communications Team Lead* Student team lead for the wireless communications group for Grama Seva (Rural Development) activities of University.

## RESEARCH SUPPORT

My research was supported by NSF Grants [CCF-1318103](#), [CCF-0963996](#), [CCF-0905509](#), [CCF-1524852](#), [CNS-1157377](#) and a [Google Research Award](#) to the University of California Riverside; PI: Prof. Rajiv Gupta.

## HONORS & AWARDS

- *Best Student Paper Award* at the 28th International Workshop on Languages and Compilers for Parallel Computing ([LCPC](#)), Raleigh, NC. Sep 2015
- *UCR Graduate Student Association Travel Grant* to present our research at the LCPC Conference. Sep 2015
- *Selected for NSF Sponsored Student Travel Grant* to the IEEE CLUSTER Conference. Sep 2015
- *UCR Graduate Student Association Travel Grant* to present our research at HIPS IPDPS. May 2014
- *Earle C. Anthony Graduate Travel Award* to present our research at HIPS IPDPS. May 2014
- *CGO 2013 Travel Grant* to present our research at the 2013 International Symposium on Code Generation & Optimization (CGO) workshop, [COSMIC](#) at Shenzhen, China. Feb 2013
- *Dean's Distinguished Fellowship* for doctoral research at the University of California, Riverside. 2011
- *Youngest Member, Nokia Technical Committee* – an elite body chaired by the Director of Technology, Nokia Bangalore, responsible for reviewing emerging technologies and their relevance to Nokia; early prototyping of pertinent technologies and recommending their adoption in products.
- *Nokia Kudos award* for independent research and curcial shipping of Nokia's SSO project. Mar 2010
- *Nokia Kudos award* for turbo boosting the performance of Device Search project. Dec 2009
- President of India, Dr. A. P. J. Abdul Kalam **Gold Medal** for excellence in M.Tech (CS). Nov 2008
- Sri R.V. Janakiramaiah **Gold Medal** for excellence in M.Sc. (Math with specialization in CS). Nov 2006
- Justice P.N. Bhagawati **Gold Medal** for excellence in the B.Sc. Honors (Mathematics). Nov 2004

## PROFESSIONAL MEMBERSHIPS

- Member, *Association for Computing Machinery* (ACM).
- Member, *Institute of Electrical and Electronics Enginners* (IEEE).

## TECHNICAL SKILLS

- *Languages* – C, OOP with C++, Java, Java Native Interface (JNI), JavaScript, HTML, Perl, Python, UML. Working knowledge in Matlab, Lisp, and Linux shell scripting. Familiar with Qt Application framework.
- *Platforms* – Hadoop, Hive, HDFS, .NET,
- *Toolkits* – Git, emacs, Eclipse, gdb, windbg, jdb, Apache Web Server, MySQL & jQuery.
- *Agile Development* – Worked with Scrum methodologies since April 2008. Brief stint as Scrum Master.

## PROJECTS

### Microsoft

- Native HDFS Shim for Azure Data Lake Store Fall 2015
- Native HDFS Shim for Microsoft COSMOS platform Summer 2014
- Performance Isolation in Microsoft COSMOS platform Summer 2013

### Graduate & Doctoral

- Enhanced Speculation for Distributed Parallel Computing on the Cluster. Fall '14 – Spring '15
- BigData processing on single commodity machines. Spring '14 – Spring '15
- Language Support for Applications with Very Large Data Sets. Winter '14 – Spring '14
- Automatic Adaptive Balance of Computation & Communication. Winter '13 – Spring '13
- Distributed Shared Memory for Large Dynamic Data Structures. Summer '12 – Fall '12
- Automated run-time resource optimization for multi-core systems. Summer – Winter '11
- Investigation of Packet Size Distributions during busy periods using network traces. Fall '11
- An Empirical Study on Bug Categorization in Android Applications. Spring '11
- Mult-Dimensional Baker Maps for Chaos based Image Encryption (M.Tech. thesis). Summer '07 - Fall '08
- Block DCT based Optical Character Recognition for *Telugu script* (M.Sc. thesis). Winter '06

### Garage (Side Projects)

- *LLVM frontend* for the open-source V8 JS engine: supervised M.Tech.(CS) thesis for SSSU students.
- *Gitweb side-by-side diff* in JS (default ships only with Unified diff).
- *Nokia Voice Messaging* Pioneering contributor to Nokia Voice Messaging platform PoC – now approved to become a Nokia platform for emerging markets.
- *SaveURI* Firefox extension – for Firefox 2.0+ ([link on addons.mozilla.org](#)); more at [Github](#) & [Gists](#).
- *RateMyProfilePic*: Simple facebook application (running on AWS) to rate/vote profile pictures.
- *OAuth* Implemented an OAuth library in Python from RFC (for fun & learning).

### Yahoo! Inc.

- *Yahoo! Store* – Customer personalization & social features for the Award winning [Yahoo! Store](#).
- *RTML Compiler* – Extended the RTML compiler to support multi-image directive for store fronts.
- *Yahoo! Store Paranoid* – Yahoo! Store SPOC for security, audit & PCI review.
- *PCI Compliance* – Enhancements & technical audit for new feature PCI compliance & payment security.

### Nokia

- *Low Disk Space Notifier* – Design and development of Low Disk Space service provider middleware module for Nokia's Client Platform for Qt/S60.
- *Device Search* – Cross-platform search engine based on CLucene, ported to the Symbian platform with total ownership of harvester plugins. Designed, implemented, productized & maintained the Qt/C++ engine. Automated the testing & performance benchmarking of the engine via Perl/Python scripts. My role was a developer cum tech-lead.
- *Client Platform Service Framework* – Re-design and development of phone widget installer's registry.

- *Ovi Settings* – Designed and implemented subsets of the Ovi Settings application on S60 in C++. Complete responsibility for designing the subsystems. Ovi Settings is a control panel for customizing Ovi web preferences from the mobile.
- *Nokia Account Client Enabler Security Module* – Complete ownership for design and development of security framework for Nokia's SSO Qt enabler for Windows (ships with Nokia Ovi Suite 2.0+).
- *NoA SSO Qt Enabler* – Designed, implemented and managed a team for a cross-platform test suite.
- *Ovi Setup Prototype* – Co-created and maintained a rapid prototyping framework in JavaScript which enabled easy prototyping of any UI screens. In the process we contributed functionality to Nokia's WRT.