Chander Jayaraman Iyer

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Career Objective

- To leverage my experience in building machine learning models to devise scalable data-driven solutions for generating business value.

Profile Summary

- Doctoral Dissertation in Computer Science from Rensselaer Polytechnic Institute (RPI) with expertise in predictive modeling and Big Data analytics.

- Sound fundamentals in algorithms, machine learning and data mining.

- Over five years of experience in systematic software engineering and developing modular software systems.

Research Experience

- **Ph.D. in Computer Science from RPI** (August 2012 - May 2018) with CGPA - 3.57 / 4.0

  - Designed and implemented a scalable randomized least-squares solver utilizing batchwise transformations on Rensselaer's Blue Gene/Q supercomputer to solve the dense least-squares regression problem on terabyte matrices that outperforms state-of-the-art solvers in terms of performance and scalability.
  - Designed and implemented a scalable ridge regression solver using sparse embedding transforms for ill-conditioned matrices that outperforms state-of-the-art sparse multifrontal solvers.
  - Designed and implemented distributed randomized block iterative methods that were used in large-scale classification tasks computed by a kernel PCA framework.
  - Developed large-scale kernel approximation algorithms to solve the kernel ridge regression problem that outperforms a state-of-the-art randomized implementation in terms of speedup and memory.
  - Open-source implementation available within IBM's *libSkylark* framework.
  - **Tools:** C++, Linux, Matlab and Eclipse.
  - **Achievements:** Granted patent US 9,465,857 B1 during the summer internship with Groupon Inc. in 2013.

- **M.Tech. in Computer Science from IIT Bombay** (July 2008 - July 2010) with CGPA - 9.12 / 10.0

  - Developed a unified workbench by integrating various Inductive Logic Programming (ILP) systems in a modular extensible approach.
  - Proposed an algorithm to prune the search space for satisfiability in first order clauses and return a model in polynomial time that outperforms traditional approaches in terms of memory and speed on language datasets.
  - Explored feature set representations for combining ILP engines with kernel methods that addresses a variety of learning tasks like classification and clustering.
  - Implemented an automated data upload for the master charting tool currently used by Indian Railways that reduces the human workload by over two orders of magnitude.
  - Implemented a functionality in existing Postgres DBMS to calculate an estimate of query execution progress.
  - Implemented a probabilistic framework capable of suggesting spell corrections to user query given a query log.
  - Customized an existing Ubuntu Live CD to add functionality for a user to store his current working session on a removable media (USB).
  - **Tools:** Java, C, Hadoop, PostgreSQL, Prolog, PROGOL and Eclipse.
  - **Achievements:** Ranked among the **top 10** students in a class of 102 students of MTech. CSE, IIT Bombay.

- **B.E. in Electronics & Telecommunications from Mumbai University** (August 1999 - June 2003) with CGPA - 62.55%

  - Designed an IRDA to RS232 converter and vice-versa for Asea Brown Boveri's (ABB) electronic polyphase meters for secure and accurate meter transmission.
  - Designed a synchronous circuit breaker prototype for reducing power surcharges.
  - **Tools:** C, C++, Pascal, MySQL.
  - **Achievements:** Student committee co-chair for the inaugural department student year handbook.

Industry Experience

- **Data Scientist Intern at Groupon Inc., Palo Alto, CA** (June 2014 - August 2014)
    - Identifying interrelated sets of features and their relative influence to estimate aggregate demand of the quantity of deals sold for local services for a certain division, merchant and service category over different time intervals.
    - **Tools:** R, MongoDB, Hive and RStudio.
    - **Achievements:** Introduced a novel feature selection approach that significantly reduced the feature space over a state-of-the-art classifier while achieving relatively high accuracy in predicting local demand.

- **Summer Engineering Intern at Groupon Inc., Palo Alto, CA** (May 2013 - August 2013)
    - Developed a framework for achieving and maintaining high data quality through multi-dimensional clustering of data instances, accounting for anomalies and using semi-supervised learning to select and label instances that the system is most uncertain about from the different homogenous clusters.
    - **Tools:** Java, Linux, Eclipse and D3.
    - **Achievements:** Was granted patent US 9,465,857 B1 titled **Dynamic clustering for streaming data** with Matt DeLand as a part of this project.

- **Research Associate at IIT Bombay** (December 2011 - June 2012)
    - Built a robust classifier that learns from existing query tables to automatically fill in missing values of numerical attributes of entities occurring in crowd-sourced knowledge bases (KBs) using conditional random fields.
    - **Tools:** Java, Linux and Eclipse.

- **Research Intern at Yahoo! Labs, Bangalore** (January 2011 - September 2011)
    - Developed an entity resolution framework that takes a set of two or more product offer feeds and match those offers across feeds so that the combined, matched feed consists of records where each record contains all offers corresponding to the same product.
    - **Tools:** Java, Hadoop, Eclipse.
    - **Achievements:** Introduced a novel feature annotation approach where key features embedded in the offer fields are extracted in an unsupervised category independent manner that outperforms the baseline approach in terms of precision while maintaining high recall.

- **Research Intern at IBM Research, New Delhi** (July 2010 - October 2010)
    - Developed a blog search engine where a set of blogs can be navigated using orthogonal dimensions called facets which are blog concepts, blogger authority, and the blogger intent.
    - **Tools:** Java, Eclipse.
    - **Achievements:** Developed an innovative approach to assess blogger expertise on blog concepts and subsequently identifying relevant features to classify expertise on various levels.

- **Senior Engineer (Software) at Patni Computer Sytems Pvt. Ltd., Mumbai** (July 2003 - July 2007)
    - Developed an estimation template model for effective risk management planning in a web services framework that effectively learns the importance of various factors involved in deciding the web services project size.
    - Developed an end-to-end testing and validation framework for a speech application that provides an open-standard voice XML platform that supports a variety of applications.
    - Developed enhancements for a powerful network planning solution called Odyssey that provides RF design for the complete network lifecycle and an accurate radio prediction solution.
    - Developed an integrated console for the management and monitoring of multipath data connections between hosts and storage systems for Hitachi Data System's multipath data management software.
    - Developed an automated testing suite for Hitachi's multipath data management software across multiple platforms.
    - **Tools:** C, C++, Java, Shell, HTML, XML, JSP, JSTL, Servlets, Struts, Velocity, Apache Tomcat, CVS, SVN, VMWare, Qt, Rational Rose, MS Visio, MySQL, Oracle, DB2, J-Builder, Netbeans, BEA Weblogic 8.0.
    - **Achievements:** Received a **Letter of Appreciation** for the Financial Year(FY) 2005-06, the **Best Team Award** for FY 2005-06 and a **Letter of Appreciation** for FY 2003-04.

Publications

- **An Entity Resolution Framework for Matching Product Offers with Reviews.** (**in preprint**).

- **Iterative Randomized Algorithms for Low Rank Approximation of Tera-scale Matrices with Small Spectral Gaps.** *Chander Iyer, Alex Gittens, Christopher Carothers and Petros Drineas.* (**submitted**).

- **Randomized Sketching for Large-Scale Sparse Ridge Regression Problems.** *Chander Iyer, Christopher Carothers and Petros Drineas.* Workshop on Latest Advances in Scalable Algorithms for Large-Scale Systems (ScalA16), held in conjunction with the 2016 International Conference on High Performance Computing, Networking, Storage and Analysis (SC16), 2016.

- **A Randomized Least Squares Solver for Terabyte-sized Dense Overdetermined Systems.** *Chander Iyer, Haim Avron, Georgios Kollias, Yves Ineichen, Christopher Carothers and Petros Drineas.* Journal of Computational Science, 2016.

- **A Scalable Randomized Least Squares Solver for Dense Overdetermined Systems.** *Chander Iyer, Haim Avron, Georgios Kollias, Yves Ineichen, Christopher Carothers and Petros Drineas.* Workshop on Latest Advances in Scalable Algorithms for Large-Scale Systems (ScalA15), held in conjunction with the 2015 International Conference on High Performance Computing, Networking, Storage and Analysis (SC15), 2015.

- **Pruning Search Space for Weighted First Order Horn Clause Satisfiability.** *Naveen Nair, Kiran TVS, Chander Iyer and Ganesh Ramakrishnan.* International Conference on Inductive Logic Programming (ILP), 2010.

- **BET: An ILP workbench.** *Srihari Kalgi, Chirag Gosar, Prasad Gawde, Ganesh Ramakrishnan, Kiran T V S, Chander Iyer, Kekin Gada and Ashwin Srinivasan.* International Conference on Inductive Logic Programming (ILP), 2010.

Co-Curricular Activities

- Attended an International Summer school on HiPC challenges in Computational Sciences at NIIF, Hungary. (June 2014).
- Attended the Simons Institute Theory of Computing workshop on Parallel and Distributed Algorithms for Inference and Optimization at UC Berkeley. (October 2013).
- Attended a technical workshop on Recent Trends in Social Networks: Algorithms, Models and Learning at TIFR. (December 2010).
- Attended a technical workshop on virtualization technology at CSE, IIT Bombay. (March 2008).
- Attended a technical workshop on Game Theory held at TIFR. (March 2008).
- Attended a technical workshop on New Frontiers in Database Research at CSE, IIT Bombay. (March 2006).

Academic Achievements

- Ranked among the **top 10** students in a class of 102 students of MTech. CSE, IIT Bombay (2008-10 batch).

- Secured All India Rank **18** in GATE 2008 computer science. (**99.90** percentile.)

- Successfully completed PGDST certification at C-DAC Mumbai(formerly NCST) in 2007-08.