Parameswaran Raman

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RESEARCH INTERESTS

Optimization methods for Large Scale Machine Learning, Matrix Factorization, Learning to Rank, Graphical Models

EDUCATION

PhD - Computer Science, UC Santa Cruz   **Aug 2014 - present**
Thesis Advisor: S.V.N Vishwanathan
(Transferred from **Purdue University**)

PhD - Computer Science, Purdue University   **Aug 2013 - Aug 2014**
Thesis Advisor: S.V.N Vishwanathan

Masters - Computer Science, Georgia Institute of Technology   **Aug 2009 - May 2011**

MSc (Integrated) - Software Engineering, PSG College of Technology, India   **2003 - 2008**

RESEARCH EXPERIENCE

Graduate Research Assistant, UC Santa Cruz   **Aug 2013 - present**

- [**Accepted for NIPS 2014**] Worked on a new Learning to Rank algorithm (RoBiRank) inspired by Robust Binary Classification and showed that it scaled to very large-datasets with an optimization scheme independent of the size of the dataset.

- [**In Progress**] Working on an efficient SGD algorithm for scaling up multinomial logistic regression problems to very large number of classes. Our algorithm exploits attractive properties found in several objective functions in machine learning, allowing us to distribute both data as well as model parameters across multiple machines, thus encouraging the development of more sophisticated models.

Research Intern - Microsoft (CISL group)   **Summer 2015**
(Mentors: Dhruv Mahajan, Keerthi Selvaraj)
Worked on the problem of extrapolating learning curves in machine learning. The goal was to study if it was feasible to use information from the models learnt on various sizes of small bites of data to extrapolate performance of the algorithm on the full data.

Research Intern - Search Relevance (SNA), LinkedIn   **Summer 2014**
(Mentors: Viet Ha-Thuc, Shakti Sinha)
Worked on resolving issues of sample bias and position bias present in learning to rank systems with implicit feedback. Explored a variety of approaches, and ran offline and online experiments on LinkedIn Job Search portal to verify the effectiveness of the models.

Graduate Research Assistant, Purdue University   **Aug 2013 - Aug 2014**
[**Accepted for EDM 2014**] Worked on ITAP Informatics educational mobile and web apps data to infer relevance of user posts to the lecture topics using a model with standard measures like tf-idf and KL-divergence. Results were used to improve student engagement in classroom.

Independent Research, Info Lab, Stanford University   **Summer 2012**
Explored the scope of using learning methods in crowd-sourcing systems, to improve label complexity and quality of judgements among workers. In addition, experimentally analyzed the effects of using various interfaces for categorization of items in a taxonomy, simultaneously trying to model their

error rates.

Graduate Research Assistant, Sonification Lab, Georgia Tech **Aug 2009 - May 2011**
[**Work appeared in several demos and accepted for ICAD 2010, CSUN 2010**]
Prototyped tools to demonstrate key ideas that came up in two projects Auditory Menus and In-Vehicle Assistive Technology (IVAT). Applied machine learning techniques to detect the mood of the driver and provide rapid responses.

Research Assistant, Dept of Maths & Computer Applications, PSG Tech **2007 - 2008**
[**Accepted for DCCA Jordan 2007 and PETRA 2008**] Worked with Dr Nadarajan and Dr Maytham Safar to propose effective cache replacement policies for Location-Dependent Data in mobile environments and implement tools for evaluating them.

INDUSTRY
EXPERIENCE

Software Engineer, Yahoo!, Sunnyvale **Jul 2011 - Jul 2013**

- Worked for the Personalization group, on an entity detection/resolution system used by all personalization services. Used machine learning and NLP to detect word/phrase boundaries and rank extracted entities based on metrics such as aboutness and interestingness. Later part of my work involved designing a Knowledge Graph from scratch to represent entities and relationships from diverse sources.
- Worked on the Web Of Objects project, that aims to create a semantic knowledge base of entities, to deliver more personalized content for Yahoo!. Implemented tools to evaluate Entity Blocking & Matching, and designed features for models used in Entity De-dup/Matching.
- Worked on Apache Oozie (most popular workflow scheduler for Hadoop), implementing features to make hadoop job information such as pig stats available to the end-users. Also fixed bugs in the system.

Software Engineering Intern, Intel, Chandler **Summer 2010**
Developed a searching and indexing infrastructure to help silicon engineers find relevant product design information. Gathered requirements, interacted with customers, wrote tests and deployed the system to production. Received an instant recognition award for the work during this internship.

Application Developer, ThoughtWorks, Bangalore **Jun 2008 - Jul 2009**
Designed and implemented web-services for the train ticket retailing system - thetrainline.com. Performed Build & Environment tasks. Worked in an agile setup with focus on test-driven development and continuous integration principles.

PUBLICATIONS &
POSTERS

- Hyokun Yun, Parameswaran Raman, S.V.N. Vishwanathan. "**Ranking via Robust Binary Classification and Parallel Parameter Estimation in Large-Scale Data**," *NIPS*. 2014.

- Mariheida Córdova Sánchez, Parameswaran Raman, Luo Si, Jason Fish. "**Relevancy Prediction of Micro-blog Questions in an Educational Setting**," in *Proceedings of the 7th International Conference on Educational Data Mining, EDM*. 2014.

- Parameswaran Raman, Benjamin Davison, Myounghoon "Philart" Jeon, Bruce N. Walker. "**Advanced Auditory Menus for Universal Access to Electronic Devices**," in *Proceedings of CSUN International Technology & Persons with Disabilities Conference*. 2010.

- Myounghoon "Philart" Jeon, Benjamin Davison, Jeff Wilson, Parameswaran Raman, Bruce N. Walker. "**Reducing repetitive development tasks in auditory menu displays with the auditory menu library**," in *Proceedings of the 16th International Conference on Auditory Display (ICAD)*. 2010.

- Parameswaran Raman, Narayanan Ramakrishnan, Manohar Ganesan, Gourab Kar, Dr Gregory D. Abowd. "**PiX-C: Express and Communicate (Augmenting Communication with Visual Input for Children in the Autism Spectrum)**," in *Poster presented at the UIST Student Innovation Contest.* 2010.

- Mary Magdalene Jane, Parameswaran Raman, Maytham Safar, Nadarajan R. "**PINE-guided cache replacement policy for location-dependent data in mobile environment**," in *Proceedings of the First international conference on Pervasive Technologies Related to Assistive Environments, PETRA.* 2008.

OTHER PROJECTS
- **Optimization on the surface of the (Hyper)-Sphere**
Investigated the Thompson Problem, of determining the minimum energy configuration of n electrons located on the surface of a unit sphere. Experimented with a variety of optimization methods such as Projected Gradient Descent, Penalty Methods, Interior-Point Method, Stochastic Gradient Descent, Derivative Free Methods (Nelder-Mead) to mention a few and discussed some interesting findings.
- **A machine learning algorithm for prediction in Cricket**
Devised and evaluated the affects of using a hybrid learning algorithm using quadratic regression and k-nearest neighbor to the game of Cricket, for predicting target scores in interrupted matches. This method was an improvement over the current D/L method by also taking into account additional features such as power play and momentum of the game.
- **PiXC - Sentence Generation using Images**
[**Accepted for UIST 2010**] Developed a Natural Language Generation system capable of generating sentences using a combination of images. Used a probabilistic weighting scheme to connect concepts that are related based on available training data. ().

ACADEMIC SERVICES
- Helped as reviewer for UAI 2014, AISTATS 2015, COLT 2015

HONORS/AWARDS
- Graduate Research Assistantship, UC Santa Cruz
- Graduate Research Assistantship, Georgia Tech
- Winner of Facebook Hackathon 2010 at Georgia Tech & selected to represent the finals at FB HQ
- Finalist for the poster presentation at UIST Student Innovation Contest 2010

COMPUTER SKILLS
- C++, Java, R, Python, Matlab, MPI, Hadoop, Unix, Lisp, Haskell