Guna Prasaad Jeganathan

Curriculum Vitae updated February 2015

Contact Information

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Research Interests

Primary: Databases, Information Retrieval, Data Mining, Distributed Systems
Secondary: Machine Learning, Natural Language Processing

Education

Bachelor of Technology (Hons.) **July 2011 - Present**
Computer Science and Engineering
Indian Institute of Technology Bombay, Mumbai
CGPA: 8.77/10.00

Higher Secondary Examination (CBSE, India) **July 2011**
Maharishi Vidya Mandir, Chennai, 95.8%

Matriculation (CBSE, India) **July 2009**
DAV Senior Secondary School, Chennai, 97.6%

Publications

Rishiraj Saha Roy, J Guna Prasaad, Aishwarya Padmakumar, and Ponnurangam Kumaraguru, *Automated Linguistic Personalization of Targeted Marketing Messages Mining User-generated Text on Social Media*, Accepted for presentation at the 16^{th} International Conference on Computational Linguistics and Intelligent Text Processing (CICLing 2015)

Patents

Rishiraj Saha Roy, J Guna Prasaad, Aishwarya Padmakumar, and Ponnurangam Kumaraguru, *Automated Linguistic Personalization of Ad Messages for Targeted Campaigns*, Patent Application Number P4592-US, United States Patent Office, filed on 10 December 2014 (Patent pending)

Research Experience

Undergraduate Research Project, IIT Bombay *Ongoing*
Improving Read Latency for Write-Optimized Index Structures Guide: S. Sudarshan

- Indexing techniques optimized for a higher write throughput such as LSM Trees generally compromise on read performance
- We are working on designing and implementing an indexing technique optimized for both read and write latencies on HBase, an open source implementation of Google's Big Table

Bachelor's Thesis, IIT Bombay *Ongoing*
Phrasal Verb Simplification Guide: Pushpak Bhattacharya

- We are working on simplifying phrasal verbs, which are difficult to handle for both non-native speakers of English and machine translation from English to resource poor languages
- We identify complex phrasal verbs, disambiguate using word space models and replace them with valid substitutes obtained from bilingual information with another language

Internship, Adobe Research Labs Bangalore *May-Jul 2014*
Automated Linguistic Personalization of Ad Messages Guide: Rishiraj Saha Roy

- Designed and developed a novel method of personalizing ad messages based on the linguistic style of a target segment identified by age, gender, occupation, location
- Extracted appropriate modifiers from advertisements and inserted them in the text to decrease cross entropy with language model of target segment

Internship, Chennai Mathematical Institute *Ongoing*
Synthesis Modulo Bisimulation Guide: Madhavan Mukund

- We are working on the open problem of synthesizing distributed transition systems from global specifications with bisimulation as equivalence criterion
- We have gathered evidence that the collapse in state space when one obtains the bisimulation quotient of the distributed transition system can be quantified

Key Course Projects

Cost Metric for Query Optimization *Oct-Dec 2014*
Implementation Techniques for Relational Database Systems Guide: S. Sudarshan

- Enhanced size estimation using additional histogram information and thereby the efficiency of the cost metric in the PyroJ query optimizer to achieve resourceful plans for execution

Virutal Memory Management System *Mar-Apr 2014*
Operating Systems Guide: Dhananjay Damdhere

- Developed multi-level page table virtual memory management for an UNIX-based OS
- Designed and implemented efficient data structures and algorithms for handling process memory allocation, swap space management and page replacement strategies

Parallel Processing in Multi-core Architectures *Oct-Dec 2013*
Computer Architecture Guide: Bernard Menezes

- Analyzed performance gains in multi core architecture for representative problems such as Merge Sort, Matrix Multiplication, Monte-Carlo Simulation and the Bellman Ford algorithm
- Estimated the degree of parallelism through techniques such as the Karp Flatt metric

Control Flow Graph Language Processor *Feb-Apr 2014*
Implementation of Programming Languages Guide: Udhay Khedkar

- Developed a language processor for control flow graph dumps generated by gcc
- Implemented a compiler as well as an interpreter for the language

L2 Readability *Jan-Apr 2014*
Undergraduate Research Project Guide: Pushpak Bhattacharya

- Performed a complete study of existing techniques in estimating readability of a text, in particular for second language learners
- Created benchmark metric for readability for Indian L2 learners based on NCERT textbooks for grade levels from 4 to 12

Inferring Power Relations from Social Interactions *Feb-Apr 2014*
Introduction to Natural Language Processing Guide: Pushpak Bhattacharya

- Studied how conversational behaviour in social interactions can reveal power relations among participants
- Explored efficacy of various learning models in characterizing linguistic styles impacted by power differentials

Talks & Seminars

Linguistic Personalization using Social Media Autumn 2014
NLP-AI Group, CFILT, IIT Bombay

Text Simplification and Readability Autumn 2014
Lexical Resources Group, CFILT, IIT Bombay

Hopfield Networks and Applications Spring 2014
Guide: Prof. Pushpak Bhattacharya, IIT Bombay

Longest Increasing Subsequence in Streaming Data Autumn 2013
Guide: Prof. Nutan Limaye, IIT Bombay

Teaching

Head Teaching Assistant, Computer Programming & Utilization

- Serving as the head teaching assistant for Spring 2015. Earlier served as head for Autumn 2014, and the edX version of the course, managing a team of 10 junior teaching assistants
- Also served as a junior teaching assistant for a previous offering of the course, responsible for teaching and mentoring course projects for a group of 14 students

Teaching Assistant, Implementation of Programming Languages

- Served as a teaching assistant for the undergraduate level course on compiler and interpreter design with an active lab component

Scholastic Achievements

- Secured **Zonal Rank 3** in the AISSE conducted by CBSE 2009
- Secured **All India Rank 326** in **IIT-JEE 2011**, among 5 lakh candidates 2011
- Declared successful at the **Indian National Mathematical Olympiad (INMO)** 2011
- Awarded **Kishore Vaigyanik Protsahan Yojana (KVPY) Scholarship** 2011
- Awarded **Narotam Sheksharia Scholarship** for Undergraduate Studies 2012

Positions of Responsibility

Manager, Web and Coding Club **2013-14**

- Overall Co-ordinator of one of the largest student clubs with over 1200 members. Organized 22 events comprising talks and workshops over a wide range of programming topics
- Promoted programming as a hobby and as a necessary academic skill by creating an informal engaging environment

Institute Student Mentor **2014-15**

- Incharge of a group of 10 freshmen to help adjust to the new environment, academically as well as socially and guide them towards holistic development
- Participated in the Mentor Training Workshop organised by Tata Institute of Social Sciences, Mumbai

Department Academic Mentor **2014-15**

- Involved in mentoring and helping junior undergraduates of Computer Science
- Assisting students who are part of the Academic Rehabilitation Program at IIT Bombay in establishing themselves and taking complete course curriculum

Referees

Prof. S. Sudarshan
Head of Department, CSE
IIT Bombay, Mumbai
phone: *available on request*
email: *available on request*

Prof. Pushpak Bhattacharya
Vijay and Sita Vashee Chair Professor
IIT Bombay, Mumbai
phone: *available on request*
email: *available on request*

Prof. Madhavan Mukund
Dean of Studies
Chennai Mathematical Institute
phone: *available on request*
email: *available on request*

Rishiraj Saha Roy
Computer Scientist
Adobe Research Labs Bangalore
phone: *available on request*
email: *available on request*