Guna Prasaad Jeganathan

Contact Information

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Research Interests

Database Systems, Big Data Management, Distributed Systems

Current Position

Microsoft Research India, Bangalore (Jun 2015 - Present)
Research Fellow Advisor : Ganesan Ramalingam

Education

Indian Institute of Technology Bombay **2011-15**
B.Tech in Computer Science and Engineering
CGPA : 8.77/10.00

Publications

R. S. Roy, A. Padmakumar, **G. P. Jeganathan**, and P. Kumaraguru, *Automated Linguistic Personalization of Targeted Marketing Messages Mining User-Generated Text on Social Media.* Computational Linguistics and Intelligent Text Processing - 16th International Conference (CICLing 2015): 203-224 **[Best Paper Award]**

Patents

R. S. Roy, **G. P. Jeganathan**, A. Padmakumar, and P. Kumaraguru, *Linguistic Personalization of Messages for Targeted Campaigns*, USPTO Application No. 14/566,181 (Patent pending).

Research Experience

Multicore Operator Scheduling for Streaming Systems (Jun 2015 - Present)
Advisor: Ganesan Ramalingam, Microsoft Research India

- Explored replication of key-based stateful operators on shared memory multicore architectures and designed experiments to analyze static and dynamic partitioning strategies
- Studied effects of memory management on performance, both in C# and C++, and identified problems due to unnecessary context switches during garbage collection in C#.
- Built a flexible test bed to experiment with different scheduling techniques, which we have used to analyze a variety of static and dynamic strategies prevalent in the literature

Currently, we are working on a dynamic scheduler that schedules operators based on its progress in the pipeline and optimizes for processor utilization.

Index Structure for Key Value Store (Jan 2015 - Present)
Advisor: S. Sudarshan, IIT Bombay

- Designed and implemented an optimized version of buffer tree (Lars Arge, 1995) that provides good read and write performance unlike the log structured indexes that comprmise heavily on reads for better write performance
- Improved the buffer emptying algorithm using cache status of blocks: push down selectively comparing seek cost and transfer size, and to the lowest cache-resident child aggressively rather than the immediate child.
- Optimized primary key inserts using bloom filters for leaf nodes and node buffers.

Currently, we are designing optimal recovery techniques that minimize the log footprint. Preliminary experiments have shown promising performance for reads and writes. We are preparing our results for a publication.

Automated Linguistic Personalization of Ad Messages (May 2014 - Jul 2014)
Advisor: Rishiraj Saha Roy, MPI Germany (previously at Adobe Advanced Technology Lab, India)

- Designed and developed a novel method of personalizing ad messages based on the linguistic style of a target segment

- Mined user generated textual content on social media to build language models that represent the language style of customer segment
- Extracted modifiers (adjectives, adverbs) from positive sentiment advertisements on Twitter and inserted them in the template at appropriate positions using statistical co-occurrence metrics
- Evaluated style similarity using cross entropy techniques and also verified indistinguishability from human generated ads through crowd source experiments

Synthesis Modulo Bisimulation (Nov 2013 - Dec 2014)
Advisor: Madhavan Mukund, Chennai Mathematical Institute

- Worked on the open problem of synthesizing distributed implementation from global specifications in the framework of transition systems, using bismulation as the equivalence criterion.
- We focussed on the loosely cooperating model of distributed transition systems.
- Proved the *diamond closure* property in the bisimulation quotient of a synthesizable system, and showed that the bisimulation quotient need not necessarily be a product.

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

Talks & Seminars

- Linguistic Personalization using Social Media (Jul 2014)
  NLP-AI Group, Centre for Indian Language Technology, IIT Bombay
- Text Simplification and Readability (Sep 2014)
  Lexical Resources Group,Centre for Indian Language Technology, IIT Bombay
- Hopfield Networks and Applications (Mar 2014)
  Advisor: Prof. Pushpak Bhattacharya, IIT Bombay
- Longest Increasing Subsequence in Streaming Data (Mar 2014)
  Advisor: Prof. Nutan Limaye, IIT Bombay

Teaching

- **Computer Programming & Utilization** *(Head Teaching Assistant)* : Served as the head teaching assistant for Spring 2015, Autumn 2014 and MOOCs offerings. Also served as a junior teaching assistant for a previous offering, responsible for teaching and mentoring a group of 14 students.
- **Implementation of Programming Languages** *(Teaching Assistant)* : Helped in designing assignments, evaluating projects and examinations, and also mentored students during lab sessions.

Leadership

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, workshops and competitions over a wide range of programming topics
- Promoted programming as a hobby and as a necessary academic skill by creating an informal engaging environment, which resulted in a significant increase in participation for ACM-ICPC and open source contributions through GSOC

Mentorship

- **Department Academic Mentor** : Mentored a group of 14 junior students related to academic issues and helped students in Academic Rehabilitation Programme to cope up with academic pressure and complete the course of study successfully
- **Buddy Programme** : Helped international students visiting IIT Bombay through semester exchange programmes in making a smooth transition to the academic and social culture at the campus