Sagar Sen

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Objective

I am looking for a **Postdoctoral Position** in the area of Model-driven Engineering of Ubiquitous Systems. My personal interest is in developing model transformations to **scale new/existing formal methods**. The general application will be *design space exploration* in modelling domains from science and engineering. For instance, my PhD thesis at INRIA, Rennes is about scaling the formal method Alloy for automatic effective model and product discovery.

Please have a look at the abstract: **https://www.irisa.fr/triskell/members/sagarsen/papers/thesis/abstract**

Experience

Full-time Doctoral Researcher, INRIA Rennes Bretagne-Atlantique (http://www.irisa.fr)   May 2007 - Current

- Involved in the French National Project "Domino" and European project "S-Cube"

- Conducted research on "Automatic Effective Model Discovery" with applications to test model generation, product generation in software product lines, web-service orchestration synthesis.

- More information http://web.me.com/sagarsen

Full-time Research Intern, INRIA Rennes Bretagne-Atlantique (http://www.irisa.fr)   July 2006 – Oct 2006

- Conducted research on model synthesis with constraints in the TRISKELL team

- Designed software and wrote research papers on the topic

Part-time Teaching Assistant, McGill University (http://www.cs.mcgill.ca)   Jan 2007- April 2007

- Teaching assistant for various undergraduate computer science courses at McGill

Freelance Patent Examiner, Global Prior Art Inc. (http://www.globalpriorart.com)   May 2006- April 2008

- Extensive Literature Survey in Current and Archival Documentation

- Documenting Evidence to Defend Intellectual Property Rights

Full-time Research Assistant, JNCASR, Bangalore (http://www.jncasr.ac.in)   Nov 2003- August 2004

- Building a Beowulf cluster for High Performance Computing

- Programming in C using X-MOTIF and OpenGL for Molecular Dynamics Visualization

- Programming in C++ using MPI based libraries to assist large-scale physical chemistry simulations

Education

Ph.D. (Thesis), Computer Science at INRIA Rennes, France   May 2007- March 2010 (Expected Submission)
Thesis: "Automatic Effective Model Discovery"

Software Prototypes: Cartier, Metamodel Pruner, and Avishkar

M.Sc. (Thesis), Computer Science at School of Computer Science, McGill University   Sept. 2004- Aug. 2006

Commonwealth Fellow (Out of selected 4 in India in all disciplines)

Thesis: "A Model Driven Approach to Design Engineered Physical Systems"
CGPA: 3.94/4
Relevant courses: Machine learning, probabilistic reasoning in A.I., object oriented software development, modeling and simulation, modeling and simulation based design, compiler design, Science writing and publishing

B.E, Computer Science and Engineering (VTU, Bangalore)   Aug. 1999- Aug. 2003
Percentage: 82.5%

Skills

I am experienced in most commonly used general purpose programming languages such as Java, Python, Modelica, Matlab, C, C++ with the ability to learn/refresh any new language rapidly for a given project. However, what intrigues most is systems design and simulation/execution at a high-level of abstraction. Model-driven engineering drives me. Briefly, I have experience in modelling environments such as Eclipse, model transformation languages such as Kermeta, AToM3, formal specification language such as Alloy and Prolog, and models of computation such as state machines, Petri nets, DEVS, differential algebraic equations, etc. My current skill is in integrating these formalisms and technologies to build complex software systems faster and in a reliable fashion.

Academic Awards

1. **European Project S-Cube and Domino 3 year PhD award**: 68400 Euros

2. Commonwealth fellowship for 2 year masters program in computer science at McGill University (offered to only 2 students in Computer Science from India in 2004, 4 students overall) (value is around $60,000 CDN)

3. Quebec differential award for the summer of 2005 by the Faculty of Science, McGill University (value is around $5000)

4. Top 2% of class of about one hundred in bachelor's program

List of My Publications

Current List: http://web.me.com/sagarsen/SagarPro/Publications.html

Recent Work Under Review

(4) Kattepur Ajay, **Sen S.,** Baudry B., Pairwise Interactions to Effectively Sample QoS in Dynamic Web Services (Submitted to FSE 2010)

(3) Kattepur Ajay, **Sen S.,** Baudry B., Beneveniste A., Jard C. Variability Modeling and QoS Analysis of Web Services Orchestrations. (Submitted to ICWS 2010)

(2) **Sen S.,** Moha N. Baudry B., Mahe V., Barais Olivier, and J.-M.Jezequel, Towards Reusable Model Transformations (Submitted to a SoSyM special issue on Model-driven Interoperability) .

(1) **Sen S.,** Mottu J.M. Baudry B., Automatic Model Generation for Transformation Testing (Submitted to a SoSyM special issue for ICMT 2009)

Journal Articles

(5) N. Moha, **Sen S.,** Faucher C., Barais O., and J.-M.Jezequel, Evaluation of Kermeta on Graph Transformation Problems, Journal of Software Tools and Technology Transfer, 2010

(4) **Sen S.,** B. Baudry, Vangheluwe H., Towards Domain-specific Model Editors with Automatic Model Completion, Simulation : Transactions of the Modeling and Simulation Society, 2009

(3) Sen S.K., **Sen S.,** Linear Systems: Relook, Concise Algorithms and Matlab Programs, Academic Studies - National Journal of Jyoti Research Academy, Vol. 1(1) 1-8, Feb 2007

(2) Sen S.K., Agarwal H., **Sen S.,** Chemical Equation Balancing: An Integer Programming Approach, Mathematical and Computer Modeling, 44(7-8), October. pp 678-69, 2006

(1) Sen S.K. and **Sen S.,** O(n^3) g-inversion-free non-iterative near-consistent linear system solver for minimum-norm least-squares and nonnegative solutions (Accepted for publication in the Journal of Computational Methods in Sciences and Engineering), 2005

Conference Articles

(13) G. Perrouin, **Sen S.,** Klein J., Baudry B, Le Traon Yves, Automated and Scalable T-wise Test Case Generation Strategies for Software Product Lines, ICST 2010, Paris, France (Acceptance rate 26.5%)

(12) **Sen, S.,** N. Moha, B. Baudry, and J.-M.Jezequel, Meta-model Pruning. In Proceedings of MoDeLs. 2009. Denver, Colorado. (Acceptance rate: 16%) 2009

(11) **Sen, S.,** B. Baudry, and J.-M. Mottu. Automatic Model Generation Strategies for Model Transformation Testing. In Proceedings of International Conference on Model Transformation. 2009. Zurich, Switzerland. (Acceptance rate: 22%) 2009

(10) **Sen S.,** Baudry B., Mottu Jean-Marie. On Combining Multi-formalism Knowledge to Select Models for Model Transformation Testing. ICST'08 (Acceptance Ratio : 20%), 2008

(9) **Sen S.,** Baudry B. Partial Model Completion in Model Driven Engineering. In Proc. of International Conference of Applications of Declarative Programming 2007, Wurzburg, Germany. 2007

(8) **Sen S.** and Vangheluwe H., Multi-Domain Physical System Modeling and Control Based on Meta-Modeling and Graph Rewriting, Proc. of the IEEE CACSD, pp 69-75, Munich, Germany, 2006

(7) **Sen S.,** Concurrent Competitive Learning to find Cluster Centers Automatically, Proc. Of 48th International Congress of the ISTAM. 63-71, 2003

(6) Sen S.K., **Sen S.** A Shrinking-rectangle Randomized Algorithm with Interpolation for a Complex Zero of a Function, Proc. of 47th International Congress of the ISTAM. 72-80, 2002

(5) Sen S.K., **Sen S.** Linear Program Solver: Evolutionary Approach, Proc. of 46th International Congress of the ISTAM. 75-84, 2001.[PDF] [BibTex]

(4) **Sen S.,** Nagarthnam S. Evolution of neural networks for Boolean function learning, 15th CSI student convention, PESIT, 2001

(3) Sen S.K., **Sen S.,** Polytope-shrinking Algorithm for Linear Programming: Concise Form and Expository Review, Proc. of International Conference on Recent Advances in Mathematical Sciences (ICRAMS) pp. 320-326, 2000 [PDF] [BibTex]

(2) Sen S.K., **Sen S.** Karmarkar Form of Linear Program and Algorithm: Precise Presentation, Proc. of 45th International Congress of the ISTAM. 88-96 , 2000

(1) Sen S.K., **Sen S.,** A near-consistent linear system solver, Proc. 44th International Congress of Indian Society Of Theoretical and Applied Mechanics (ISTAM), 76-82, 1999

Workshop Articles

(2) **Sen S**., Baudry B., Vangheluwe Hans, Domain Specific Model Editors with Model Completion, LNCS vol. on Models in Software Engineering,Workshops and Symposia at MoDELS 2007,Nashville, TN, USA, September 30 — October 5, 2007 (Best Paper) 2007

(1) **Sen S.,** and Baudry B., Mutation-based Model Synthesis in Model Driven Engineering, (To be published in the Proc of IEEE ISSRE, Mutation Workshop.) 2006

Balance in Life

Sports: Competitive Rowing with Ligue de Bretagne, McGill Crew
Previous Sports: Dragon boat racing, soccer, swimming, and table tennis
Hobbies: Digital (Sports) Photography, Drawing and Painting, Guitar, Modern Jive

Service

Academic Reviewer: Models 2008, Models 2009, ICST 2008,ICST 2009, ICSE 2009, ISSRE 2008, QSIC 2009
Rowing Coach for beginner and intermediate rowers
International Student Buddy (to help international students to McGill settle down in the city of Montreal)

References

Dr. Benoit Baudry (INRIA, Rennes, France) : bbaudry@irisa.fr
Prof. Jean-Marc Jezequel (INRIA, Rennes, France) : jezequel@irisa.fr
Prof. Hans Vangheluwe (Computer Science, Antwerp University, McGill University) : hv@cs.mcgill.ca
Prof. Robert France (Computer Science, Colorado State University, USA): france@cs.colostate.edu
Prof. Sundaram Balasubramanian, CPMU, JNCASR, Bangalore : bala@jncasr.ac.in