

Research Interests

- Artificial Intelligence, Machine Learning, Reinforcement Learning, and Optimisation Theory.

Education

- **Indian Institute of Technology, Madras** Chennai, India
BTech./MTech. in Computer Science and Engineering; **CGPA: 9.15/10** Aug. 2007 – Present
 - Major: **Computer Science and Engineering**; Minor: **Physics**
 - Key Courses: Data Mining, Reinforcement Learning, Natural Language Processing, Kernel Methods for Pattern Analysis, Social Network Analysis, Planning and Constraint Satisfaction, Non-linear Analysis, Algebraic Geometry, Classical Mechanics, Quantum Mechanics, Advanced Theory of Computation
 - **GRE:** 1460/1600 (Quantitative: 800/800 Verbal: 660/800 Writing: 4.5/6)
 - **TOEFL:** 115/120 (Reading: 30/30 Listening: 30/30 Speaking: 27/30 Writing: 28/30)

Patents and Publications

- Poster titled “Learning in a Small World” presented at the European Workshop for Reinforcement Learning (EWRL) 2011.
- Patent titled “Probabilistic Model Approximation for Statistical Relational Learning” filed.
- Paper titled “Learning in a Small World” currently review for Autonomous Agents and Multi-Agent Systems (AAMAS) 2012.
- Paper titled “Statistical Relational Learning Modulo Axioms” currently under review for Programming Language Design and Implementation (PLDI) 2012.

Research Experience

<http://arun.chagantys.org/research:home>

- **RL Homomorphisms in Continuity and Partial Observability** IIT Madras
Mentor: Balaraman Ravindran Sept 2011 – Present
 - My objective is to address the question of characterising and discovering MDP homomorphisms in continuous and partially observable domains.
- **Statistical Relational Learning Modulo Axioms** Microsoft Research India
Arun Tejasvi Chaganty, Aditya Nori, Akash Lal, Sriram Rajamani May 2011 - July 2011
 - Applied Counter-Example Guided Abstraction Refinement, and generalisation (from program analysis) to the Markov Logic Network framework, with significant performance improvements over existing solvers.
- **Learning in a Small World** IIT Madras
Arun Tejasvi Chaganty, Prateek Gaur, Balaraman Ravindran March 2011 - October 2011
 - Proposed a method of generating options based on Kleinberg’s small world network model. Agents trained with these options learned to perform tasks significantly faster than existing techniques.
- **Analysing the Perez-Malta-Couthino model in population dynamics** IIT Madras
Mentor: Gaurav Raina Jan 2011 – Oct 2011
 - Analysed the stability of fixed points and limit cycles of a population dynamics system described by a quadratic delay differential equation using the center manifold theorem and Hopf bifurcation theory.
 - **To be submitted to SIAM Applied Dynamical Systems.**
- **Collapsed Variational Bayes for the Log-Normal LDA** IIT Madras
Mentor: Balaraman Ravindran Aug 2010 – Dec 2010
 - Incorporated topic correlations in the Latent Dirichlet Allocation model by adding a Log-normal prior on the topic distributions. Implemented the same in `Octave`, using Collapsed Variational Bayes updates.

- **Enhancing the Statistical Model of Holmes** Microsoft Research India
Mentor: Kapil Vasawani May 2010 – July 2010
 - Worked on *finding likely root causes of bugs in programs* using statistical properties collected on a set of test cases for the program.
- **NetSyn: Network Management with SMT Solvers** Microsoft Research India
Mentor: Sriram Rajamani May 2010 – July 2010
 - Developed a framework to declaratively construct low-level router configurations for an enterprise network from an arbitrary high-level policy using Satisfiability Modulo Theories (SMT) solvers. The framework scaled to networks of the order of a thousand nodes, including several real networks.

Development Experience

<http://arun.chagantys.org/projects/home>

- **Webbed Feet: Judge for AI Competitions** Chennai, India
IIT Madras Aug 2010 – Nov 2010
 - Built an online judge for AI competitions. This platform has been used for CS6380: Artificial Intelligence at IIT Madras, and at IIT Mandi, as well as at Shaastra and Exebit ¹.
- **Interpreter for the Clay Programming Language** Chennai, India
IIT Madras Jan 2010 – May 2010
 - Built a basic interpreter using the LLVM compiler infrastructure for the generic programming language, Clay, developed by Tachyon Technologies, Chennai.
- **Dynamic Firewalls for Micro-budgeting Connectivity** San Diego, CA, USA
Qualcomm Corporate R&D May 2009 – July 2009
 - Compared the performance of `iptables` on Linux, and Windows Filtering Platform on Windows, and wrote a WFP driver to implement a dynamic firewall on Windows. Was awarded the **Roberto Padovani Scholarship** from Qualcomm in 2009 for “stellar performance” on my internship assignment.
- **Integrating Vim with the Anjuta IDE** Hyderabad, India
Google Summer of Code '08 May 2008 – Aug 2008
 - Integrating the popular Vim text editor into Anjuta, an open-source IDE in collaboration with the GNOME Foundation, under the Google Summer of Code Program.

Teaching and Leadership Experience

- **Teaching Assistant for CS2110: Computer Programming Lab** Chennai, India
IIT Madras Aug 2011 – Present
 - Designed course syllabus and assignments, and taught classes. Implemented several changes to help scale with the large class size (62 students).
- **Teaching Assistant for CS6730: Probabilistic Reasoning in AI** Chennai, India
IIT Madras Jan 2010 – June 2010
 - Designed assignments, gave recitations.
 - **Textbooks:** Probabilistic Graphical Models, *Daphne Koller and Nir Friedman*; Pattern Recognition and Machine Learning, *Chris Bishop*.
- **Speaker at Open Source Workshops**
 - Co-organised and conducted Free and Open Source Software Workshops on GNOME at Shaastra 2008, 2009, and on Python at Exebit 2010.
- **Head of Web-Operations** Chennai, India
Shaastra 2008, 2009
 - Co-led a team of 9 students in creating web-applications and designing the website for Shaastra 2009 which had over 12 million hits. Led a 3-member team in designing the event registration portal for the same in 2008.

¹Shaastra and Exebit are IIT Madras' student-run technical festivals

Achievements & Awards

- **Yahoo! HackU (2010):** Placed 2nd for a prototype of a contextual news retrieval tool.
- **Qualcomm Innovators Challenge (2009):** Placed 1st for the product design of an information management tool.
- **Kishore Vaigyanik Protsahan Yojana (2006):** Fellowship awarded by the Department of Science and Technology, Govt. of India to promote interest in the basic sciences.