

Objective

Graduate school admission in a doctoral programme in the field of Computer Science and Engineering, followed by a career in research and teaching.

- **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: 9.13/10** 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, Classical Mechanics, Quantum Mechanics, Advanced Theory of Computation, Algebraic Geometry

Research Experience

- **RL Homomorphisms in Continuity and Partial Observability** Chennai, India
IIT Madras Sept 2011 – Present
 - Objective is to address the question of characterising and discovering homomorphisms in continuous and partially observable domains in reinforcement learning.
- **Analysing the Perez-Malta-Couthino model in population dynamics** Chennai, India
IIT Madras 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.**
- **Learning in a Small-World** Chennai, India
IIT Madras Jan 2011 – Oct 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. **Currently under review at Autonomous Agents and Multi-Agent Systems (AAMAS) 2012.**
- **BayeZ: Relational Learning Modulo Axioms** Bangalore, India
Microsoft Research India 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. **Currently under review at Programming Language Design and Implementation (PLDI) 2012.**
- **Collapsed Variational Bayes for the Log-Normal LDA** Chennai, India
IIT Madras 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** Bangalore, India
Microsoft Research India 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** Bangalore, India
Microsoft Research India May 2010 – July 2010
 - Proposed 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.

Development Experience

- **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.
- **Debugger 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, currently being 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 Management Experience

- **Teaching Assistant** Chennai, India
IIT Madras 2010 – Present
 - **CS2110: Computer Programming Lab:** *Responsible for the course syllabus, and contents.* Implemented several changes to help scale with the large class size (62 students).
 - **CS6730: Probabilistic Reasoning in AI:** Followed chapters of Daphne Koller’s book on Graphical Models, as well as Chris Bishop’s book on Pattern Recognition.
- **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 front-end for the same in 2008.
- **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.

Achievements & Awards

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

Skills

- **Languages:** C/C++, C#, Python, F#, \LaTeX , Bash, HTML, CSS, PHP, Matlab, Mathematica
- **Operating Systems:** Proficient in Windows and Linux environments; Comfortable working with 8-bit AVR micro-controllers
- **Software:** `lex`, `yacc`, GTK+, wxWidgets, Django, Win32, Windows Device Framework (WDF), WPF, Visual Studio SDK, Z3, Infer.NET

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