Research Projects and Seminars

- **Textual Entailment**
  M. Tech. Thesis. guided by Prof. Pushpak Bhattacharyya *(June 2011 - Present)*
  - **Objective** Given a piece of natural language text T and a hypothesis H the system detects if H can be inferred from T. Textual entailment provides a generic framework for semantic inference which is required by applications such as information retrieval, questions answering and summarizing.
  - The system being developed uses deep semantic approach and is the first to utilize Universal Networking Language (UNL) for textual entailment.
  - **Literature Survey** Extensive study of existing approaches ranging from naive lexical approach to logic based approaches was done. UNL was studied. Various open source textual entailment packages were also studied.
  - Participated in Recognizing Textual Entailment competition organized by International Text Analysis Conference
- **Performance Analysis of Particle Swarm Optimization (PSO)**
  B. Tech. Dissertation guided by Prof. Bijan Misra *(May 2007- May 2008)*
  - **Objective** The project aimed at analyzing different variants of PSO to various families of uni-modal and multi-modal functions to determine which variant is suitable for a particular family.
  - **Literature Survey** Extensive study was done on evolutionary computing, focusing on various bio-mimicry approaches such as Ant Colony Optimization, Artificial Immune System and Genetic Algorithms.
- **Spotter for Entity List Completion**
  R&D Project guided by Prof. Ganesh Ramakrishnan *(Jan 2011 - May 2011)*
  - **Objective** Develop a Top-k Spotter for the TREC's Entity List Completion Track.
  - **Tools Used** Sparse Multinomial Logistic Regression (SMLR) was used on trie of documents for classification. Hadoop's Map-Reduce was used for distributed computation.
- **Textual Entailment**
  M. Tech. Seminar guided by Prof. Pushpak Bhattacharyya *(Jan 2011 - May 2011)*
  - **Objective** The seminar was aimed at gaining a deep insight into the problem and get abreast with the current state of existing systems, leading to Masters Project.
  - **Literature Survey** Started with Tutorials on Textual Entailment by Ido Dagan et. al. Wide range of approaches from lexical to logic based approach was studied focusing mainly on Graphical and Machine Learning Approaches.

Key Course Projects

- **On-line Calendaring and Collaboration Tool**
  Software Laboratory

  - Developed a web application that allows a registered user to maintain events and share them with their peers.
  - Users can see if their peer is busy or free at that time before scheduling an event.
  - Privacy options lets the user to control who can see what they are doing.

- **Parts Of Speech Tagging using Hidden Markov Model**
  Artificial Intelligence
  - Developed an application that uses a corpus and Viterbi algorithm to train a Hidden Markov Model which could tag the words of a given sentence with their parts of speech.
- **Word Sense Disambiguation using IWSD**
  Natural Language Processing
  - Developed an all-word sense disambiguation application that detects the correct sense of a polysemous word based on the context using iterative word sense disambiguation (IWSD) algorithm.
- **Word Sense Disambiguation using ALEPH**
  Statistical Relational Learning
  - Developed an target-word sense disambiguation application on PROLOG using an inductive logic programming (ILP) algorithm by the name ALEPH.
- **Grapheme to Phoneme conversion using MOSES and GIZA++**
  Natural Language Processing
  - Developed an application that learns pronunciation of character sequences using Carnegie Mellon University's pronunciation dictionary, GIZA++, a statistical translation model tool, and MOSES a Statistical Machine Translation System.

Position of Responsibility

- **Assistant to HoD, Dept. of CS&E, IIT, Bombay**
  - Co-ordinated maintanance of Department resources
  - Assisted in creation of department space inventory
- **Teaching Assistant, IIT Bombay**
  - Artificial Intelligence - Conducted tutorials and lectures
  - Introduction to Programming - Conducted lab sessions and tutorials
- **Laboratory In-charge of First Year Master's Students**
  - Responsible for the maintanance of systems in the M.Tech Laboratory
- **Class Representative (CR)**
  - Represented the class of 2nd year, B.Tech, Computer Science.
  - Participated in organizing various events as a part of being a CR, including Fresher Welcome and Zygon Tech-fest

Scholastic Achievements

- Was selected for Final round of National Science Olympiad.
- Secured distinction in National Green Olympiad.
- Received Certificate of Merit on being selected for Third round in Bournvita Quiz Contest.

Courses Taken

- Artificial Intelligence, Speech and Natural Language Processing and the Web, Machine Learning, Statistical Relational Learning, Web Search and Mining, Introduction to Probability and Linear algebra, Topics in Mathematical Foundation of Formal Verification.

Technical Skills

Languages C/C++, JAVA, Python, Haskell, LISP, Prolog

Tools Weka, Lucene, Matlab, Aleph, SystemT, Moses, GIZA++