



Akshay Soni
Mechanical Engineering
Indian Institute of Technology, Bombay

09010011
UG Third Year (B.Tech.)
Male
DOB: 18/11/1990

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2011	8.07
Intermediate/+2	MPBSE	Shree Sanskar Academy	2008	90.00
Matriculation	MPBSE	Pushpa Convst HS School	2006	90.00

Achievements

- **National Talent Search Examination (conducted by Government of India)** : Qualified in 2006
- **CSIR (Centre for Scientific and Industrial Research, India)**: Participated in **Young Junior Scientist Competition** held in 2006 and proposed a model based on passive architecture.
- **IIT-JEE (Joint Entrance Examination conducted by Govt. of India)**: Qualified in 2009 and ranked among **top 0.3%** of the **450,000** candidates appeared.
- **AIEEE (All India Engineering Entrance Examination conducted by Govt. of India)**: Qualified in 2009 and ranked among **top 0.25%** of the **1050,000** (approx.) candidates appeared.
- **BITSAT (Birla Institute of Technology and Science Admission Test conducted at National Level)**: Qualified in 2009 and ranked among **top 0.04%** of the **200,000** (approx.) candidates appeared.
- Recipient of **MCM (Merit cum Means) Scholarship** on the basis of academic performance.
- Shortlisted for the **Aditya Birla Campus Ambassador Program** for IIT Bombay.
- Awarded a **Scholarship of Rs.8000** and the **Certificate of Merit** by the **District Educational Officer** for securing the **1st position** in district in **Higher Secondary Examination**.

Internships & Seminars

DECISION ANALYSIS & RISK MODELLING LABORATORY, CRANFIELD UNIVERSITY, UNITED KINGDOM

(Under Dr. Ken Mc Naught & Dr. Adam Zagorecki)

May 2011 till July 2011

"Prognostic Modeling of Dynamic Systems"

- Designed a **software tool** called **Predictive Maintenance Probabilistic Decision Support tool** using **JAVA** technology to assist in the creation of a **Dynamic Bayesian Network** model to support **prognostic modelling** and predictive maintenance decisions.
- Conducted a thorough **comparative study** on different **modelling techniques** (both **data driven** and **stochastic**) viz. **Artificial Neural Networks, Hidden Markov Models & Kalman filters** and **suggested** the use of **Bayesian Networks** as modelling framework.
- Implemented & tested a working prototype of **Expert Elicitation Tool** and **Bayesian Network Modeling Tool** using **J-SMILE (Structural Modeling, Inference and Learning Engine)** which is the Java version of fully portable library of C++ classes implementing graphical decision-theoretic methods, such as Bayesian net-works and influence diagrams, directly amenable to inclusion in intelligent systems.
- Presented my work to the **Research Staff** of the University which they recognized as a good infrastructural work to set their further research goals.

ADITYA BIRLA GROUP

Winter 2010

"Improved Supplier Performance Rating Model for Aditya Cement"

- **Designed a model** to rate suppliers' performance based on an elaborate, logical and mathematical formulation for each significant criterion.
- Proposed a **Pair-Wise** evaluation technique for obtaining weights, **Disadvantage functions** to evaluate performance taking specification limits in consideration, **Analytical Hierarchical Process** and an efficient application of **Monte Carlo Algorithm** to reduce inaccuracies creeping in due to subjectivity and intuitive estimations.
- Conducted a thorough **data analysis** of four major suppliers of Aditya Cement and **simulated the results in MATLAB** to obtain rating for these four suppliers.
- Received an approval from **Vice-President (Commercial)** of **Aditya Birla** for the final implementation of the model into their system.

PAPER PRESENTATION

"Hidden Markov Model for Dynamic Obstacle Avoidance of Mobile Robot Navigation"

Guided by: Prof. Pushpak Bhattacharya, Department of CSE, IIT-Bombay

Autumn 2010

Salient features:

- Models and control strategies for **dynamic obstacle avoidance** in visual guidance of mobile robot.
- A **stochastic motion-control algorithm** based on a **Hidden Markov Model (HMM)**.
- Obstacle motion prediction applies a **probabilistic evaluation scheme**.
- Motion planning of the robot implements a **trajectory-guided parallel-search strategy** in accordance with the obstacle motion prediction models

SEMINAR ON AI & OPTIMIZATION

Autumn 2010

- Prepared a seminar on **Artificial Intelligence & Optimization**
- Extensively **studied advanced text books** and **research papers** on **AI & Optimization**.

SEMINAR ON GAME THEORY & STRATEGIC THINKING

Summer 2010

- Conducted a seminar on **GAME THEORY & STRATEGIC THINKING** under the excellent guidance of the **Principal Consultant** at **Mind Tree Consultancy**, Bangalore.

Project Activities

MINI UNIQUE IDENTIFICATION SYSTEM

Course Project, Autumn-2009

Guided by: Prof. Deepak Phatak, Department of CSE, IIT-Bombay

- Designed and implemented a software system for finger print recognition compiled in **C++** using **advanced data structures and algorithms**.
- Worked as a **team leader** and devised **an exhaustive algorithm** to convert ".XPM" format to the digits 0 and 1. Also **researched a method** to obtain a pattern of minutiae for fingerprint matching within **35-40% accuracy**.

IMPLEMENTATION OF A* ALGORITHM

Course Project, Autumn-2010

Guided by: Prof. Pushpak Bhattacharya, Department of CSE, IIT-Bombay

- Implemented **3 different heuristics** for **8 Puzzle Problem** and **Missionaries & Cannibals Problem** independently and compared the **number of nodes** expanded with different **heuristics**.
- Analyzed the effect of **violation** of **Monotone restriction** and **Admissibility**.

HMM BASED POS (Parts of Speech) TAGGING ALGORITHM

Course Project, Autumn-2010

- Implemented **Baum Welch Algorithm** on a huge corpus for estimating the **state transition probabilities** simulated the results in **Python**.

SIMULATION OF INVERTED PENDULUM

Course Project, Autumn-2010

- Worked with a team of 3 to create a profile of **current** and **angular variables** using **fuzzy logic**.
- Simulated the working of inverted pendulum in **MATLAB** using those current, angular displacement and angular velocity.

A CASE STUDY OF MICROSOFT

Marketing Management Course Project- 2009

- Analyzed the market position of Microsoft Corporation and conducted a thorough **SWOT & PESTAL** analysis
- Worked with a **team** of **5** and suggested ways to maintain the **market share** by proper optimization and balanced portfolio management in **target markets**.

Positions of Responsibility

- **CORE GROUP MEMBER (Insight –IIT Bombay's student newsletter and media body)** : Responsible for coverage of various events in the institute. Also playing a key role in editing of articles and management & allocation of various events to the journalists' panel.
- **WEB NOMINEE (IIT-Bombay Campus Radio)**: Served as the manager of Campus Radio Website (an initiative under CULTURAL COUNCIL OF IIT-Bombay).
- **CO-ORDINATOR (TECHFEST-2011)**: Organized an **ETHICAL HACKING WORKSHOP** and conceptualized **INVESTMENT FUNDRAISE SESSIONS** in TECHFEST-2011.
- Served as the **School Leader** of my **Senior Secondary School (Year-2008)** and was awarded the **Pride of Sanskar Academy** award, the highest award for total overall performance in academics and other activities.

Extra Curricular Activities

TECHNICAL:

- **TECHFEST-2010**: Designed and exhibited a **SOLAR-BOAT** in a competition and recorded the **Best Track time** in the institute.
- **TECHFEST-2011**: Taking part in various **Tech-events**(Robotics and Coding competitions like **NEXUS-NAVIGATE** and **Code Maestros**)

SOCIAL SERVICE:

- Helped in managing a District Level **Cataract Operation Camp** organized by **Rotary International** where in about 1000 people were operated successfully.

MISCELLANEOUS:

- Published Articles in the campus news paper "**Insight**" and school souvenir.
- **TECHFEST (one of the Asia's largest technical festival) 2009-10**: worked as an **Organizer** in **Tech-Connect** event (an **International Exhibition**) held in TECHFEST IIT-BOMBAY.
- Won many prizes in **Public Speaking** and **Debating competitions** at school and district level.
- Won **1st prize** many times in the Inter-Convent **Essay Writing Competitions** in School Days.
- Appointed as a **Program Organizer** for cultural activities during **Silver Jubilee Celebration** of my school held in 2006-07.
- Attended various seminars on **The Role of Consciousness in Leadership**

Electives & Computer Proficiency

- **Electives: Marketing & Financial Management, Artificial Intelligence, Stochastic Models, Optimization**
- **Operating Systems** : WINDOWS , GNU/LINUX
- **Programming/Scripting Languages**: C,C++, VISUAL BASIC, JAVA, MATLAB, SQL, SCHEME, GNU-PROLOG
- **Web Development**: HTML/CSS, JAVA SCRIPT
- **Other Software**: Efficient in using **Office Package & SAP system**