Dibyendu Mondal

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Undergraduate student with Computer Science Major and Honors

Publications and Talks

- Raksha Sharma, Dibyendu Mondal and Pushpak Bhattacharyya
  A Comparison among Significance Tests and Other Feature Selection Methods for Sentiment Analysis: A First Study
  Under submission in Natural Language Engineering (NLE)
- Raksha Sharma, Dibyendu Mondal and Pushpak Bhattacharyya
  Statistical Significance Tests and Its Impacts in Sentiment Analysis
  Accepted Tutorial in 13^{th} International Conference on Natural Language Processing, 2016
- Presented a paper by Bouaziz et al.
  Realtime Performance-based Facial Animation
  Seminar at IIT Bombay

Internships and R & D Projects

Undergraduate Thesis: Reconstruction from multiple Depth Sensors
Guide: Prof. Parag Chaudhuri & Siddhartha Chaudhuri, CSE Dept, IIT Bombay Ongoing

- Designing a system that scans a human body using low-cost commodity Depth Sensors
- Robustly reconstructing a synthetic mesh of a person using these partial, noisy scans

Study of Significance Tests as Feature Selection Method for Sentiment Analysis
Guide: Prof. Pushpak Bhattacharyya, CSE Dept, IIT Bombay Autumn 2016 - Current

- Studied and Compared various feature selection methods like TFIDF, Delta-TFIDF, Relief, χ^2 test and t-test
- Analysed the impact of significance tests in In-domain, Cross-domain and Cross-lingual SA in various dataset
- Concluded that t-test is more promising than any other significance test or feature selection method

Optimal NW Scheduling Strategies for Dense DSDS Deployment Scenarios
Guide: Pradeep Dwarakanath, Sr. Chief Engg., Samsung R & D Institute Bangalore Summer 2016

- Studied the behavior of secondary SIM in case of switching from one SIM to another in Dual SIM phones
- Used various probabilistic models to learn and predict the behavior of the secondary SIM
- Employed smart scheduling strategies at network to minimize the loss of "On Air" resources
- Tested the code with multiple configurations and showed improvement in resource utilization at NW

JEE Main/Advanced Counselling Portal
Guide: Prof. Sharat Chandran, CSE Dept, IIT Bombay Summer 2015

- Built a Django based web portal where JEE Mains/Advanced students can enter their ranks and interests
- Based on a statistical model, checked the available branches with different probabilities
- Used HTML5, Bootstrap, Javascript, jQuery for designing all the web pages
- Developed a feature using which students can directly upload final choices on official Seat Allocation portal

Branch Change Algorithm for IIT Bombay
Guide: Prof. Sharat Chandran, CSE Dept, IIT Bombay Summer 2015

- Designed and implemented an algorithm to automate the Branch Change process
- The candidates are taken in CPI order and are assigned a branch based on predefined rules
- Implemented the algorithm using Java which promises best possible programme to top candidate
- Tested and verified the algorithm on the actual dataset constructed from last two years

Teaching Experience

Software Systems Lab
Prof. Sharat Chandran, CSE IIT Bombay Spring 2016

- Designed and evaluated labs and projects for a batch of over 120 students
- Conducted tutorial sessions for helping the students in topics like django
- Awarded **TA of the Month** for excellence in work as Teaching Assistant, across all courses in the department

Key Academic Projects

Real-time Performance based Facial Animation
Guide: Prof. Parag Chaudhari, CSE Dept, IIT Bombay Spring 2016

- Created a low-cost facial animation system using a non-intrusive, commercially available 3D sensor (Kinect)
- Reconstructed the set of user-specific blendshapes that best reproduce the example expressions
- Represented dynamics of facial expressions using a generic blendshape rig
- Coded it in C++ using PCL tools and library to generate and store point clouds

Droids in RenderMan
Guide: Prof. Parag Chaudhari, CSE Dept, IIT Bombay Spring 2016

- Designed a humanoid and a non-humanoid (BB-8) bot, inspired from the Star Wars movies
- Used multiple point lights which acted as an area light and generated soft shadows
- Used indirect illumination for Color Bleeding and Photon Mapping for Caustics
- Coded it in RSL and rendered in RenderMan, a renderer by Pixar

Music Classification based on Genre
Guide: Prof. Siva Kumar G., CSE Dept, IIT Bombay Autumn 2015

- Developed a Music Genre Classifier using Feedforward Neural Network
- Tested the classifier on various kinds of inputs for classifying them into pop, classical, metal, rock etc
- Studied different parameters like total error, sensitivity and specificity and achieved > 80% accuracy
- Coded it in Python using libraries like Pybrain and Neurolab

Animation of Droids
Guide: Prof. Parag Chaudhari, CSE Dept, IIT Bombay Autumn 2015

- Designed a humanoid and a non-humanoid (BB-8) bot, inspired from the Star Wars movies
- Textured the bots and surrounding environment and added light sources for the background
- Added features like constrained rotation and translation of the bots along 3 axes
- Coded it in C++ using graphics libraries like OpenGL, GLFW and GLEW

Simulation of Rube Goldberg's model
Guide: Prof. Sharat Chandran, CSE Dept, IIT Bombay Spring 2014

- Modeled a simulation of a Rube Goldberg's Machine using Box2D in C++
- Designed a robust system to develop a simulation using objects like dominos

Statistical Inference from Dataset
Guide: Prof. Ganesh Ramakrishnan, CSE Dept, IIT Bombay Spring 2014

- Developed a system for attribute extraction from in-domain sentences
- Learned attributes were used to make statistically appropriate conclusions
- Used Python for extraction of patterns from the knowledge database

Buy and Sell platform
Guide: Prof. N.L. Sarda, CSE Dept, IIT Bombay Autumn 2015

- Built a Java based web portal where people in an organization (like IIT Bombay) can Buy and Sell items
- Used HTML5, JSP and Javascript for designing the web pages and PostgreSQL for handling the database
- Added features like profiles, messaging, searching and filtering of items

Doodle Jump
Guide: Prof. Supratim Biswas, CSE Dept, IIT Bombay Spring 2013

- Designed a game where the goal is to move an object to the top using space and arrow keys
- Added a feature in which the doodle (or object) changes shape and color when it touches the plank
- Implemented it in C++ using Simplecpp, a graphics library

Technical Proficiency

- **Programming Languages:** C/C++, Python, SWI-Prolog, Bash, Java (basic)
- **Web Development Languages:** HTML5, SQL, Django, Bootstrap, CSS, JavaScript, jQuery, Flask
- **Others:** OpenGl, Qt, PRMan, PyBrain, NumPy, Octave, LaTeX, Eclipse

Scholastic Achievements

- Secured **All India Rank 914** in **JEE (Advanced) 2013** among 150,000 candidates
- Awarded Certificate of Merit **(Top 0.1%)** in **Computer Science** in the AISSCE 2013 exam by CBSE
- Secured All India Rank **11** in National Science Talent Search Examination 2010, **24** in Cyber Olympiad 2010 and International Rank **77** in International Maths Olympiad 2011 by SOF World
- Received **Undergraduate Research Award** from IIT Bombay

Scholarships

- Fellow of **Kishore Vaigyanik Protsahan Yojana (KVPY) 2012** in the **SX-E Stream** awarded by Department of Science and Technology, Govt. of India
- Selected in **Chennai Mathematical Institute (CMI)**, with scholarship for UG admission-2013
- Shortlisted for **INSPIRE** Scholarship by Ministry of HRD , Govt of India for being in the **Top 1%** in Science Stream of **AISSCE 2013** Exam conducted by CBSE

Relevant Courses Undertaken

Computer Aided Geometric Design
Artificial Intelligence
Technology and Animation
Digital Geometric Processing*
Computer Graphics
Advanced Computer Graphics
Basics of Animation*
Computer Vision*

*To be completed by Apr'17

Positions of Responsibility and Extra-Curricular Activities

- Represented CSE class of 2017 in **Department UG Council** and other Intra Dept. Events
- Co-organized various Hackathons by **Microsoft**, **Facebook** and **Web and Coding Club**, IIT Bombay
- Participated in various Hackathons conducted by **Microsoft** code.fun.do, **Facebook**, **Google** Developers Group, **Angel Hack** in Bombay Stock Exchange, **Web and Coding Club**, IIT Bombay
- Reached **National Finals** of **Code Uncode'14**, a hunt for secure programmers by **EC Council**
- Participated in **Build the Shield**, a national level hacking contest hosted by **Microsoft India**
- Designed an **Autonomous Line Following Bot**, in a competition by **Robotics Club, IIT Bombay**