Sudhanshu Mittal

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EDUCATIONS

Indian Institute of Technology Guwahati, India
B. Tech. in Computer Science and Engineering — Jul 2010 – Jun 2014

GPA: **8.28 / 10**
Final semester GPA: 9.25 / 10
Thesis: Investigation of the Controllability of Cancer Networks

St. Anselm's Pink City School, Jaipur, Rajasthan, India
Senior Secondary (Class 12^{th}) , C.B.S.E. — 2010

Performance: 88%

St. Anselm's Pink City School, Jaipur, Rajasthan, India
Matriculation (Class 10^{th}) , C.B.S.E. — 2008

Performance: 93.4%

WORK EXPERIENCE

Applications Engineer
Oracle Corporation, Hyderabad, India — Jun 2014 – Present

- Involved in design and development of Oracles Fusion Applications
- Performed regression analysis to developed a mathematical model of the scalability of Fusion HCM Connect
- Certified in Java, SQL, Big Data and Hadoop

Summer Internship
Arista Networks, Bangalore, India — May 2013 – Jul 2013

- Worked on Latency Analyzer (LANZ) for network switches to detect traffic micro-bursts
- Developed OS support for Remote Procedural Calls (RPCs) through HTTP/JSON queries
- Both these features now shipped with Arista's multi-layer network switches.

Summer Internship
Inforill Technologies, Chennai, India — May 2012 – Jul 20126

- Applied Monte Carlo Algorithms to simulate passenger motion on a railway station
- Developed Domain Specific Language for processing documents in Nutrition Domain
- Developed actor model for both these applications.

RESEARCH EXPERIENCE

Investigation of the Controllability of Cancer Networks — Aug 2013 – May 2014
Guide: Prof. Ashish Anand, Department of CSE, IIT Guwahati

- Aim was to identify driver nodes in Cancer bioregulatory network
- Modeled Cancer gene network using Boolean networks
- Established theoretical complexity bound (NP-Hard) for model's solution
- Deduced polynomial-time reduction of the problem into Binary Quadratic optimization problem
- Solved the optimization problem to derive Cancer controlling gene candidates
- Research soon to be submitted for publication in Nature

PUBLICATION MANUSCRIPTS

R. D. Sharma, S. Mittal, S. Tripathi, S. Acharya, "Using modern neural networks to predict the decisions of Supreme Court of the United States with state-of-the-art accuracy". published in Proceedings of International Conference on Neural Information Processing (ICONIP), Turkey, 2015

R. D. Sharma, S. Tripathi, S. K. Sahu, S. Mittal and Prof. A. Anand, "Predicting Online Doctor Ratings from User Reviews using Convolutional Neural Networks". accepted in Proceedings of International Conference on Machine Learning and Computing (ICMLC), Hong Kong, 2015

ACADEMIC HONORS & AWARDS

International Astronomy Olympiad Training Camp 2010

Held at HBCSE, Tata Institute of Fundamental Research (TIFR), Mumbai
Selected among 35 students from across India

IIT Joint Entrance Examination 2010

Ranked among top 0.27% ; All India rank 1231 ; Institute Rank 7th

All Indian Engineering Entrance Examination 2010

Ranked among top 0.04% ; All India rank 468

National Talent Search Examination (NTSE) scholarship 2008

Awarded by the Government of India

State Science Talent Search Examination (SSTSE) scholarship 2008

Awarded by the Chief Minister of Rajasthan to 20 students across the state

SKILLS

Experienced: C, C++, Python, SQL, Java
Intermediate: MATLAB, R, Javascript
Operating systems: Windows and Linux

ONGOING PROJECTS

Automatic Speech Recognition System for Numeric Utterances Sep 2015 – Present
Guide: Prof. Pradip K. Das, Professor, IIT Guwahati

- Calculated Mel-frequency cepstral coefficients (MFCC) as training features
- Supervised sliding window classification using Convolutional neural network
- Regularized using dropout and augmented data with Gaussian noise addition
- Attained 98.4% accuracy on new utterances of known speakers and 72% on previously unmet speakers

LibSeq: Theano based Python library for sequence learning Jul 2015 – Present

- Implemented popular Deep learning algorithms for sequence learning in Theano
- Included linear regression, Elmann network, Long Short Term Memory Recurrent Neural Networks (LSTM-RNN), and Neural Turing Machine
- Neural Turing Machine Achieved more consistent convergence than the popular implementation.

PREVIOUS PROJECTS

Improving Word Vectors for Medical Corpora using retrofitting Apr 2015 – Sep 2015
Guide: Prof. Ashish Anand, Assistant Professor, IIT Guwahati

- Extracted word vectors using Googles Word2vec algorithm
- Trained over 200,000 journal articles from Pubmed Central
- Words segmented using Stanfords English Tokenizer
- Included Medical Subject Headings (MeSH) ontology to retrofit word vectors

Drug Side-effect Prediction: A Systems Thinking approach Jan 2014 – May 2014
Guide: Prof. Ashish Anand, Assistant Professor, IIT Guwahati

- Predicted side effects using chemical attributes and target genes interactions
- Used Multilayer perceptron (MLP) and Kernel Canonical Correlation Analysis
- Improved upon the state of the art by 1.8%

Web search engine Sep 2013 – Nov 2013
Guide: Prof. S. Ranbir Singh, Assistant Professor, IIT Guwahati

- Implemented web search engine in Python for retrieving web pages corresponding to user query
- Developed a two-level in-memory index using Patricia Trie and hash map
- Used linear scalarization of TF-IDF and Google Page Rank for most relevant web page
- Implemented text summarization algorithm to display page summary with results

Example based Machine translation System Sep 2013 – Nov 2013
Guide: Prof. Sandipan Dandapat, (ex) Assistant Professor, IIT Guwahati

- Developed a variant of Levenstein algorithm for finding best sentence match in Python
- Used English to German translational memory
- Leveraged information retrieval system for fast translation candidates searching
- Addressed Word Sense ambiguity using Lesks algorithm on Wordnet ontology

Source Code Cloud Repository Mar 2013 – Apr 2013
Guide: S. Ranbir Singh, Assistant Prof., IIT Guwahati

- Developed an online code repository which allows collaboration and reviewing coding projects
- Managed a team of four members
- Designed and normalized database schema balancing redundancy and efficiency
- Implemented business logic in PHP and db in SQL
- Programmed a responsive and platform independent UI using Twitter Bootstrap

Simulating the private network - NS3 Mar 2013 – Apr 2013
Guide: Prof. Sukumar Nandi, Professor, IIT Guwahati

- NS3 is a discrete event, packet level network simulator for Internet systems
- Created virtual topology with TCP/IP protocol, and handled traffic related queries using NS3

Compiler for Subset of C Language Mar 2013 – Apr 2013
Guide: Prof. Arnab Sarkar, Assistant Professor, IIT Guwahati

- The compiler supported functions, with recursion, Input and Output constructs, global variable declarations, loops and branches
- Also supported type checking and block nesting
- Generated 3-address and MIPS code

Airport Management Application Mar 2012 – Apr 2012
Guide: Prof. Pradip K. Das , Professor, IIT Guwahati

- Developed an application which managed all aspects of an airport such as ticket booking (allowing seat selection), canceling the ticket, managing employees, financial aspects, database backup, taxi booking, scheduling flights, gates, resource management
- Managed a team of 10 students
- Responsible for the design and implementation of runway allocation algorithm implemented using Priority queues

Strengthen Support for Pintos Operating System Jul 2012 – Nov 2012
Guide: Prof. Gautam Barua, (ex) Director, IIT Guwahati

- Pintos is a bare-bone OS developed at Stanford with simple threading, user-program management and a file system
- Implemented synchronization through semaphores and priority scheduler for threads
- Added system calls and argument passing for user programs
- Enhanced the file system by adding indexing, sub directory support and extensibility of files

Design and fabrication of 4 bit Processor Mar 2012 – Apr 2012
Guide: Prof. S.B. Nair, HOD, Department of CSE, IIT Guwahati

- Implemented 16 machine instructions
- The processor was controlled by a programmable microprocessor

OTHER HONORS & AWARDS

Overnight Astronomy Problem Solving competition 2011 & 2012

Stood first across IIT Guwahati for two consecutive years

Samsung Smart TV App Challenge 2012

awarded 1000$ by Samsung for gaming application

Winner at several fine art competition held in college