Satwant Rana

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Academic Interests Algorithms, Artificial Intelligence, Machine Learning, Neural Networks, Discrete Mathematics

Education **Indian Institute of Technology, Delhi**, New Delhi, India

Integrated M.Tech in Mathematics and Computing, 2012 - Present

Relevant Courses

Computer Science:	Algorithms, Data Structures, Computer Architecture, Operating Systems, Natural Language Processing, Neural Networks
Mathematics:	Combinatorics, Discrete Maths, Modern Algebra, Optimisation, Numerical Methods, Linear Algebra, Analysis, Probability and Stochastic Processes, Calculus.
Electrical:	Digital Design, Signal and Systems
Online:	Machine Learning, Probabilistic Graphical Models
Other:	Econometrics

Projects

Facial Expression Recognition using Autoencoders **Fall, 2014 - present**

Facilitator: Prof Jayadeva, IIT Delhi

The project aims at creating a deep neural network based semi-supervised framework for inferring relevant high level features from unlabeled data, using available labels to disentangle the extracted features from potentially irrelevant features, in the domain of facial expression recognition.

Implemented and compared systems with an SVM classifier built on top of *Denoising Autoencoder*, *Contractive Autoencoder*, and *Contractive Discriminative Analysis*.

The Next Generation of Open Information Extraction **Summers, 2014 - present**

Facilitator: Prof Mausam, Faculty - IIT Delhi, Affiliate Faculty - University of Washington

The project aims at creating the next generation of Open Information Extraction, a paradigm of IE, by the University of Washington, aimed at extracting arbitrary relations from web scale corpus. The next generation aims at increasing precision and recall of the current version in the domains of conjunct-list extraction, semantics of conjunctions and numeral understanding

Implemented and compared systems for the conjunct-list extraction problem, based on transitional dependency parsing through Clear Parser and Stanford's shift reduce constituency parser, leading to an overall increase in recall in the OpenIE pipeline.

Sentiment Mining for Tweets **Fall, 2014**

The project aimed at creating a binary sentiment classification tool for tweets, with generic positive and negative sentiment labels.
Explored Naive Bayes, SVM and Recurrent Neural Net classifiers. Implemented an SVM solution based on sentiment vectors for tweets.

Paice Husk Stemmer **Spring, 2014**

Implemented the Paice Husk Stemmer, as a patch for the Xapian project. Created a C++ version that can be fed directly with custom rules. Also wrote a program to create a Snowball version with custom rules.

A data structure for company hierarchy **Spring, 2013**

Implemented a Data Structure for storing Hierarchical Structure of a Company, with the features of quickly adding, deleting and finding LCA in the heirarchial tree of two employees. Implemented an AVL Tree for logarithmic time queries in the data structure.

Awards and Honours

2014 Shortlisted for *Summer Undergraduate Research Award*, IIT Delhi
2012 9th at *ACM-ICPC* Asian Regionals
2012 Attended Indian Training Camp for *International Olympiad in Informatics*
2012 All India Rank 817 in IIT Joint Entrance Examination
2012 All India Rank 85 in All India Engineering Entrance Examination
2012 Became *KVPY* fellow
2011 Rank 1 in Regional Maths Olympiad, Delhi
2011 National Top 1 percentile award in *NSEP* and *NSEA*
2010 Qualified *NSEJS* and *NSEA Jr.*

Affiliations

2014 Student Mentor at Indian National Olympiad in Informatics Training Camp, Delhi
2014 Member of Data and Artificial Intelligence Research Group, IIT Delhi
2014 Student Lecturer at Coding Club, IIT Delhi
2013 Student Lecturer at Indian National Maths Olympiad Training Camp, Delhi

Technical Skills

Languages: C++, Java, Python, SML-NJ, php, html, CSS, JS, theano, numpy, scipy, R
Softwares/Tools: git, Django, web2py, ubuntu, LaTeX, Mallet, Scikit library, Matlab

Sport Programming

Codechef: satwantrana, currently ranked 148 in short contests
Codeforces: satwant, yellow rated, amongst top 30 in India
Topcoder: satwant123, blue rated
Awards: 3rd in ACM - Asian Programming Contest, conducted by IIT Delhi
9th and 30th in ACM-ICPC Amritapuri Asian Regionals 2012 and 2013 resp.
1st in ACM-ICPC Kharagpur Asian Regionals online rounds

Recreational Interests

Competitive Programming, Football, Movies, Travelling