Saurav Shekhar

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Education

Year	Degree/Certificate	Institute	CGPA/Percentage
2018 (expected)	Masters of Science	ETH Zürich	-
2016	Bachelor of Technology	Indian Institute of Technology, Kanpur	9.1/10

Internships

Real-time Market Data Monitor *May '15 - July '15*

Summer internship at Goldman Sachs, Bangalore

Application is capable of consuming market data from various sources. Functionality includes monitoring and alerting on stale, missing or malformed data

- Implemented monitoring and alerting for latency spikes and various market data sanity checks
- Improved market data subscription
- Abstracted out various monitoring and alerting functionalities so that these can be reused across multiple market data source systems
- Technology Used: Java, JNI, Bash, Reuters RFA API

Personalized feed algorithm *May '16 - August '16*

Internship at ShareChat, a vernacular language social media startup, Bangalore

Aim of the project was to analyze user's activity on the app's home feed and design a personalized feed algorithm for 700k active users of the application.

- Designed a new wilson score based popularity metric for posts.
- Experimented with collaborative filtering techniques like implicit-feedback matrix factorization, user-user and item-item similarity for computing user-post rating and developed methods to compute user-tag relevance.
- Used RankSVM to compute a linear model for user-post relevance.

Projects

Object detection and classification in Surveillance videos *Jan '16 - Apr '16*

Course project in Machine Learning, tools and techniques under Prof. Harish Karnick, IIT Kanpur

- Aim of the project was to detect and classify objects from the university's surveliance videos into pre-defined classes (2/4 wheelers, pedestrian etc)
- Used selective search and background subtraction techniques to extract candidate region proposals for classification
- Extracted feature using various methods like SIFT, HOG, Convolutional Neural Networks, Autoencoders and Restricted Boltzman Machines. Used classification algorithms like Random Forests, SVM and Decision trees and compared the results.
- On image classification, achieved an accuracy of more than 90% using CNNs.

Identifying age, gender and health from brain fMRI images *Sept '16 - Dec '16*

Course project (Kaggle challenges) in Machine Learning under Prof. Joachim Buhmann, ETH Zurich

- Used segmentation (into white and grey matter) and extracted features like canny edges, SIFT, Histograms from input brain fMRI images
- Used SVM's, Logistic Regression, Random Forests and ensembles like Adaboost, bagging to improve accuracy

Online algorithms for large datasets *Sept '16 - Dec '16*

Course project in Data Mining under Prof. Andreas Krause, ETH Zurich

- Implemented online algorithms for similarity detection (Locality sensitive hashing), Clustering (coreset construction followed by k-means), Image Classification (SVMs using Random Fourier Features) and News recommendation (linUCB)
- Placed in top 15% on the leaderboards

Random Graphs *July '15 - Nov '15*

Undergraduate project under Prof. Surender Baswana, IIT Kanpur *link to report*

- Studied Erdos-Renyi phase transitions and expected linear time algorithms for finding biconnected components in Random graphs.
- Worked on average case analysis of an incremental algorithm for maintaining DFS tree in an undirected graph

Concurrent data Structures in Haskell *July '15 - Nov '15*

Course project in Functional Programming under Prof. Piyush Kurur, IIT Kanpur

- Implemented Michael & Scott's lock-free queue algorithm in Haskell
- Used atomic-primops package for CAS and other atomic operations
- Project developed as an open source Cabal Package

Extension of NACHOS *Aug '14 - Nov '14*

Course Project in Operating Systems under prof. Mainak Chaudhuri, IIT Kanpur

- Extended the standard system call library of NachOS and implemented Fork, Exec, Join, Yield, Sleep, Exit system calls
- Implemented process scheduling algorithms like UNIX scheduling, FIFO, Round robin, SJF and non-preemptive scheduling and assessed the results
- Programmed page replacement algorithms: Random allocation, FIFO, LRU and LRU-clock and evaluated relative performance

Advances in Generative models with deep learning *Jan '16 - Apr '16*

Course project in Probabilistic Machine Learning under Prof. Piyush Rai, IIT Kanpur

- Studied two recent generative models that use deep learning techniques, deep exponential families and generative adversarial networks.
- Used an implemntation of Deep Exponential Families for topic modelling on KOS blog entries from the UCI ML Bag of Words dataset
- Used a Theano implementation of GAN to generate images from MNIST and CIFAR datasets.

R on Hadoop *Aug '14 - Nov '14*

Course project in CS52 under prof. Arnab Bhattacharya, IIT Kanpur

- Setup a Hadoop cluster on an IBM Bladeserver and install RHadoop packages on the server
- Allowed distributed processing of R-code on the Hadoop cluster
- This project was selected as one of the best in the course

Academic

- ETH Excellence Scholarship and Opportunity award, awarded to 3 students among $\approx$ 150 students admitted to MSc program in the year 2016
- Academic Excellence Award, IIT Kanpur, 2012-13
- Teaching Assistant for Data Structures and algorithms course, year 2015-16.
- Selected in Top 1% of each of the National Standard Examinations in Physics (NSEP), Chemistry (NSEC) and Astronomy (NSEA) and Regional Mathematics Olympiad.

Miscellanous

- 1^{st} place from the ETH Hub (top 50 worldwide among 3000 teams) in Google Hash Code online Qualification round. Selected for the finals to be held at Google Paris in April 2017.
- Ranked 10^{th} among 60 teams and awarded a bronze medal at ACM ICPC SWERC 2016 Regionals
- 6^{th} place among top 25 teams selected (among 8000 in online rounds) for the Codechef Snackdown onsite finale 2015
- Advanced to Round 2 of Facebook Hackercup 2013 (position 287), and Round 2 of Google Code Jam 2014
- Secured 1^{st} place in IHPC, high performance computing contest and 2^{nd} place in Battlecity, AI bot programming challenge in Techkriti 14.

Technical Skills

Programming Languages: C, C++ (Proficient), Java, Python, Haskell, Perl, HTML, PHP, Bash Shell Scripting, nodejs

Software: Torch7, Tensorflow, Caffe, MySQL, MongoDB, GIT, MIPS Assembly, LaTeX, Gnuplot, Octave, MATLAB, Amazon Web Service