Akhil **Gupta**

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Work Experience

Goldman Sachs *Bangalore, Karnataka, India*

Senior Analyst *Jul 2019 - Present*

- Designing a platform for Internal Review where we compute different data properties on large datasets
- Deployed distributed in-memory MemSQL database for Risk Division to fetch data, for calculating their metrics, in low latency and highly concurrent environment

Intel Technology *Bangalore, Karnataka, India*

Software Engineer *Jun 2018 - Jul 2019*

- Tech Lead in Power and Performance Management for ChromeOS on WhiskeyLake platform
- Designed Target Projection Model for future pl using Predictive NN Model based on several architectural features
- Optimized STREAM benchmark by 13x on Intel ICC compiler

IISc (Indian Institute of Science) *Bangalore, Karnataka, India*

Research Assistant *Aug. 2014 - Dec. 2015*

- Implemented automated code generation of optimized LBM, targeted Intel Xeon Phi, an accelerator with a high degree of parallelism
- Exploited vector and many-core parallelism, locality through Vector Intrinsics, OpenMP, TBB and tiling techniques [polyhedral technique] like diamond tiling and overlapped tiling. Used Intel VTune Amplifier for profiling. [Guide: Dr. Uday Kumar Reddy]
- Used PPCG [Polyhedral Parallel Code Generation] for similar optimizations on GPUs

Internships

IBM Research Lab *Bangalore, Karnataka, India*

Research Internship *May 2017 - Jul. 2017*

- Automated Crop-Wise Farm Delineation using Satellite Images on Apache Spark
- Used KNN Model based on NDVI value (Green Index) over a period of time to cluster similar crop fields
- Won Top 3 award in final evaluation

ArcelorMittal *Temirtau, Kazakhstan*

Industrial Trainee *May 2013 - Jul. 2013*

- Created a local web space in Python using Django framework

Projects

Optimized SGD using Equilibrated PreConditioner on Apache Spark

- Worked on optimizing SGD for non-convex optimization in Deep Learning using novel adaptive learning rate scheme, based on the equilibration PreConditioner
- ESGD performs better than RMSProp in terms of convergence speed. Implemented on dataset of size 5TB for which we used BigData platform Spark. Used TensorFlow as backend ML library

Brain Tumor Classification

- Built a model to predict probabilities for a tumour to be of a certain type (Astrocytoma, Glioblastoma (GBM) or Oligodendroglioma) in order to assist radiologists in their diagnosis
- In order to select the most relevant model, we tested the cross-validated accuracy and confusion matrices of four different models (Logistic Regression, k-nearest neighbours (KNN), Random Forest, Linear Discriminant Analysis (LDA))
- Reduced the number of features using Recursive Feature Elimination and Random Forest's features ranking in order to improve model performance and reduce the number of features to be automatically extracted from other images

Designed Online Portal for Research Papers like ResearchGate

- Created a website like ResearchGate where user can upload, search, comment and report on the research work
- Search feature was implemented using Index-based search library Whoosh

Sentiment Analysis of Twitter posts

- Built a model for Sentiment analysis that can classify emotions as positive, negative and neutral
- Utilizing both bag-of-words and word2vec representations and applying the Extreme Gradient Boosting algorithm, the classification accuracy at level of 78% was achieved

Search Engine for Wikipedia Dump

- Implemented an efficient search engine to query archived Wikipedia documents of size 60GB, using secondary indexing, TF IDF score and External Mergesort

Implemented chatbot for farmers for crop details

- [Microsoft Code.Fun.Do], Implemented a chatbot (Skype) which estimated Crop prices and details on which crops to grow
- For price estimation, we used Linear Regression and for types of crops, we used K-Means
- We used Microsoft Azure and its Machine Learning Studio

Implementation of Distributed Hash Table using Pastry Algorithm

- Designed a simulator which works on 10000 nodes and provides option for node addition, deletion and message key lookup

Optimized Stencil-based Algorithms on Intel® Xeon

- Optimized algorithms like Jacobi-2D/3D, GameOfLife, Heat-2D/3D using tiling via polyhedral model with average speedup of 14.3x

Education

IIIT-H, International Institute of Information Technology, Hyderabad

M.Tech. in Computer Science and Engineering (CGPA : 8.22) *Jul. 2016 - May 2018*

- Courses: Parallel Computing, Statistical Learning, Data Mining & Warehouse, Distributed Computing, Complexity & Advanced Algorithms

The LNM Institute of Information Technology, Jaipur

B.Tech. in Computer Science and Engineering (CGPA : 7.89) *Jul. 2010 - May 2014*

- Courses: Programming in C, Algorithms, Data Structures, Computer Networks, Operating System, Graph Theory, Linear Algebra

Skills

Programming	C/C++ (Proficient), Python (Proficient), Java (Beginner)
HPC Libraries	OpenMP, MPI, CUDA, Intel® TBB
Libraries	TensorFlow, PyTorch, Scipy, Scikit-learn, NLTK
Softwares	Visual Studio, Eclipse, Intel® VTune Amplifier, Intel® Parallel Studio, Android SDK, Source Insight
Frameworks	Apache Spark, Django, Dockers, PrestoDB
Databases	MySQL, MongoDB, MemSQL