Dhruv Kohli

Curriculum Vitae

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Education

2012-2016 Bachelors in Mathematics & Computing.
Indian Institute of Technology, Guwahati (India)
GPA - 9.06 / 10, Department Rank 2 / 54

2011-2012 Higher Secondary.
DAV Public School, Delhi (India)
CBSE Central Board Exams 92.0%, Mathematics score: 98 / 100

Work Experience

06/2016-present Researcher, Advanced Technology Lab - Multimedia Division
Samsung Research Institute, Bangalore (India)

- Developed a Deep Hierarchical Network invariant to rotation of objects in the input image with two times better cross-dataset accuracy than state of the art.
- Extensively studied a technique based on contraction mappings to increase the lower bound on the margin in the input space of a non-linear classifier. In preparation for the upcoming ICML conference.
- Currently, working on the problem of video temporal segmentation as a core component of video summarization.

05/2015-07/2015 Research Intern, Cloud and Information Services Lab Group
Microsoft Research, Bangalore (India)

- Worked on real-time detection of issues in high-dimensional performance counter time series data with the aim of detecting the time of the issue and the subset of counters which caused the issue.
- Modeled the data using a time-varying Gaussian distribution whose mean and covariance had sparse dictionary based representations that were learned automatically, and the sparse codes were constrained to be temporally dependent.
- Other approaches that we explored - clustering of objects on subsets of attributes, switching state space models, GMM, HMM and Kalman filter.

05/2014-08/2014 Software Developer, Google Summer of Code
International Neuroinformatics Coordinating Facility

- Worked on real-time vectorization of brain atlases.
- Developed an open source software "mindthegap" that vectorizes bitmaps without introducing gaps or overlaps between adjacent regions[1].
- Added services on Scalable Brain Atlas[2] website enabling researchers to view the region contours, generated by mindthegap, of the atlas registered to the uploaded brain scan.

[1] Link to software page.
[2] Link to an atlas template.

Projects

08/2015-04/2016 Thesis: **Reasoning, Attention and Memory based Machine Learning Models**[1]
Prof. Amit Sethi
Performed a literature survey on Deep Learning models for sequence to sequence learning and on RAM based machine learning models with emphasis on Neural Turing Machines and End to End Memory Networks. Implemented the former from scratch in theano and tested it on toy tasks such as copy task. Also, evaluated the available latter model on the task of question answering.

12/2014-02/2015 **Game Playing Agent using Deep Reinforcement Learning**
Implemented a deep learning model in Caffe that learns to play Atari games based on a paper by Google DeepMind. Learned various concepts in reinforcement learning - structured markov decision process, value iteration, Q-learning and temporal difference learning.

Publications

Dhruv Kohli, Biplab Ch Das, Viswanath Gopalakrishnan, Kiran Nanjunda Iyer, *Learning Rotation Invariance in Deep Hierarchies using Circular Symmetric Filters*, International Conference on Acoustics, Speech and Signal Processing, 2017 (Submitted).

Awards and Honors

2016 Ranked 2 in a class of 54 students based on GPA, Mathematics and Computing Department, IIT Guwahati.

2014 Ranked 1 accross the country in CUDA Coding Challenge India organized by Nvidia in High Performance Computing Conference.

2014 Ranked 2 in Machine Learning module of Kriti, Intra-College Technical Competition.

2013 Among top 5 teams in Code.Fun.Do organized by Microsoft at IIT Guwahati.

2012 Ranked 2076 out of 500,000 students in IIT Joint Entrance Exam.

2012 Ranked 224 out of 40,000 students after writing the exam and being interviewed for KVPY (Kishore Vigyan Protsahan Yojana) Fellowship.

2008 Awarded Student of the Year by The Times of India (TOI) for excellent all-round performance.

Skills

Prog. Lang.	Python, C, C++, CUDA
Stats. Tools	MATLAB, R
ML Libs	Keras, Theano, Caffe, TensorFlow
Others	Git, LateX, OpenMP, MPI, OpenCV

Courses

Linear Algebra, Calculus and Analytic Geometry, Differential Equations, Probability Theory and Random Processes, Statistical Analysis of Financial Data, Statistical Simulation and Data Analysis, Artificial Intelligence, Intelligent Systems and Interfaces.

[1] Link to project page.