Siddhartha Saxena

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Github Profile

EDUCATION

IIT KANPUR, INDIA | B.Tech in Computer Science | Expected April 2019 — CPI: 9.5/10*
VIJAYVERGHIYA BAL VIDYALAYA, KOTA | 12th Standard | Year 2015 — Percentage : 93.8%
DELHI PUBLIC SCHOOL REWARI | 10th Standard | Year 2013 — CGPA: 10/10

* Till 3rd Semester

RESEARCH INTERESTS

I am broadly interested in the field of machine learning, especially Deep Learning, Bayesian Machine Learning and their applications in Computer Vision and Natural Language Processing.

AWARDS AND FELLOWSHIPS

- Received **Academic Excellence Award** , IIT Kanpur for the year 2015-16 out of 100 students in the department.
- **First runner-up** in National Autonomous Underwater Vehicle Competition, SAVe-NIOT 2016 in debut attempt.
- Secured Rank **74** in Goldman Sachs Quantify (2016), with real-world Machine Learning problems.
- Secured AIR **190** , Joint Entrance Exam (JEE) Advanced 2015 from **150k** students qualified through JEE Mains.
- Received the prestigious KVPY fellowship 2015 given to **only 400** students in science stream from all over India.
- Received Merit Certificate in Mathematics for being in top **.1%** students in class XII examinations nationwide.
- Received Merit Certificate in Class X CBSE Board for being in top **.1%** students all over the country nationwide.

RESEARCH EXPERIENCE

YODLEE | Intern | Instance Selection in Big Data
Mentored by Dr Om Deshmukh, Director, Data Science | Report* — May 2017 - July 2017

- Developed an Instance Selection method that will enhance generalizability of company's other M.L. models.
- Used a novel on-line clustering technique with growing number of clusters undercutting the problem of Big Data.
- Scaled the model by using HDFS for memory issues and spark to parallelize our work, using Amazon Web Services.

GENERATING MULTIPLE PLAUSIBLE DEPTH MAPS VIA A SEQUENTIAL ADVERSARIAL NETWORK | B.Tech Project mentored by Prof. Vinay Namboodiri — December 2016 - Present

- Proposed a novel technique to produce multiple depth maps of a scene from training on just a couple of images.
- Created an artificial dataset from scratch on Unreal Engine 4 and extracted Depth Maps, comprising 4 scenes.
- Produced excellent qualitative results on KITTI dataset, showing the technique's ability to work on real datasets.
- This work is presently under evaluation, we are especially working on its quantitative results.

PROJECTS

IMPROVING VARIATIONAL INFERENCE MODELS VIA NORMALIZING FLOWS
Mentored by Prof. Piyush Rai | Code* | Arxiv* — January 2016 - April 2017

- Generated richer latent representations in Variational Auto-encoders suited to data from different classes.
- Implemented Variational Auto-encoders with Normalizing Flows for generating MNIST handwritten digits.
- Surveyed Various other Techniques for Variational Inference, overcoming the mean field assumption.

INTERACTIVE BAYESIAN DOCUMENT CLUSTERING

Mentored by Prof. Piyush Rai | Code* | Report* August 2016 - November 2016

- Built a clustering model invoking user feedback through a cycle of rejection, acceptance or ignoring the clusters.
- Employed a prior over Gaussian likelihood, down-weighing rejected clusters and vice-versa for accepted ones.
- Implemented it to cluster documents according to the topics contained in them, extracted through LDA.

AUV-IITK (AUTONOMOUS UNDERWATER VEHICLE) | Computer Vision Lead | Mentored by Prof. K.S Venkatesh and Prof Sachin Y Shinde | Code* | Report* December 2015 - December 2016

- The aim of the project is to build **Institute's first** AUV. The vehicle is capable of following distinctly-colored lines, shoot torpedoes and drop markers autonomously using sensor data and computer vision, which has been integrated using Robot Operating System **(ROS)** , used for the first time by a team in IIT Kanpur.
- Constructed the whole Computer Vision Package for AUV-IITK from preprocessing to object detection.
- Integrated shape based Pose Detection algorithms i.e. SIFT and SURF, on top of color based outline detectors.
- Leveraged the power of Intel i7 NUC, by using Convolutional Neural Nets implemented using Tensorflow.

SENTIMENTAL ANALYSIS AND HANDWRITING RECOGNITION | Association of Computing Activities | Code* | Presentation* February 2016 - April 2016

- Classified movie reviews dataset part of NLTK corpus using Naive Bayes Algorithm with 79% Accuracy .
- Implemented face recog. using Eigen Faces on 'Labeled faces in the wild' with PCA dimensionality reduction.
- Performed Handwriting Recognition on MNIST dataset via feed-forward neural net, achieving **96%** accuracy.
- Experimented with quadratic, cross entropy and softmax loss functions to improve classification accuracy.

SEMINARS AND TALKS

HIDDEN MARKOV MODELS FOR SPEECH RECOGNITION | CS201 | Presentation* October 2016

- Familiarized the audience with Hidden Markov Models and illustrated it's application on Speech Recognition

COMPUTER VISION IN ROBOTICS | Google Dev Group IITK | Presentation* March 2016

- Demonstrated the use of C.V. in robotics via ongoing projects using object detection and image matching.

* mark indicates hyperlink

RELEVANT COURSES

Bayesian Machine Learning	Linear Algebra	Data Structures and Algorithm
Machine Learning Techniques	Differential Equations	Logic in Computer Science
Introduction To Computing	Computer Organization	Probability and Statistics

PROGRAMMING SKILLS

Torch • Tensorflow • Spark • Amazon Web Services • Unreal Engine• MATLAB/Octave • CUDA • Shell Scripting • ROS • OpenCV • Github • Arduino IDE • LaTeX • R • HTML/CSS • C++ • Python • MIPS • Solidworks • Autocad

POSITION OF RESPONSIBILITY

Editor, VOX POPULI | Journalism body of IIT Kanpur | Website March 2017 - Present

- Fulfilled my goal of bringing Vox closer to people by publishing content voicing opinions of campus community.
- Led articles on pressing issues like problems of PhD students, effect of coaching on IIT undergrads, and more.
- Brought Vox to a larger scale by authoring an article that got published on **Business Insider** and **Times of India** .

President's Nominee Minimum Wage Monitoring Committee February 2016 - March 2017

- Took the initiative to reduce **child labor** as present in hall canteens and resolved contractor-worker conflicts.

EXTRA-CURRICULAR ACTIVITIES

Member , Robotics Club

- Active member of the club with numerous contributions towards the day to day functioning of the club.
- Prepared a voice recognition Robot for SnT day 2016 that actuates its motors through voice navigation.
- Presented AUV-IITK to reporters and professionals at Techkriti 2015, the annual Technical fest of IIT Kanpur.