Siddhartha Saxena

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EDUCATION

IIT KANPUR | B.Tech in Computer Science | Expected April 2019
CPI: 9.23/10

VIJAYVERGHIYA BAL VIDYALAYA,KOTA | 12th Standard | Year 2015
Percentage : 93.8%

DPS REWARI | 10th Standard | Year 2013
CGPA: 10/10

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** at IIT Kanpur for the year 2015-16.
- **First runner-up** in the National Autonomous Underwater Competition, SAVe-NIOT (2016) in debut attempt among **17** teams from top Indian Colleges.
- Secured rank of **190** in JEE Advanced 2015 out of **150k** students who qualified through JEE Mains.
- Scored 305/360 **(99.99 percentile)** rank of 777 in JEE Mains 2015 out of 1.5 million students.
- 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

INTERNSHIP

ENVESTNET YODLEE
Instance Selection in Big Data
Mentored by Dr Om Deshmukh, Director, Data Science | May 2017 - July 2017 | Report*
- Formed a data-driven Instance Selection approach from scratch that will significantly enhance the generalizability of all Data Science models implemented by the company and go into production.
- Tackled the highly complex problem via an efficient on-line clustering model in spark with growing number of clusters which undercuts the problem of Big Data and creates a proper representation of it.

PROJECTS

IMPLEMENTING CGANS FOR DEPTH ESTIMATION FROM STEREO IMAGES | Undergraduate
Project mentored by Prof. Vinay Namboodiri | December 2016 - Present | Code* | Report*

- Producing Kinect-like depth estimates from stereo images, training cGANs on Berkeley 3-D Object Dataset.
- Implementing the paper titled "Image-to-Image Translation with Conditional Adversarial Networks" in Torch which uses newly developed **GANs** framework for generating a particular image.

IMPROVING VARIATIONAL INFERENCE MODELS VIA NORMALIZING FLOWS | Course Project
mentored by Prof. Piyush Rai | January 2016 - April 2017 Code* | Report*
- Implemented Variational Auto-encoders with Normalizing Flows for generating handwritten numbers
- Produced richer latent representations in Variational Auto-encoders suited to data from different classes.
- Surveyed Various Techniques other techniques for Variational Inference, overcoming the mean field assumption.

INTERACTIVE BAYESIAN DOCUMENT CLUSTERING | Course Project under Prof. Piyush Rai | August 2016 - November 2016 | Code*

- Built a clustering model from scratch invoking user feedback via a cycle of rejection/acceptance.
- Implemented a feedback mechanism that modifies the prior, down-weighing the probability of rejected clusters and increasing it for the accepted ones to modify clustering as per the user.
- Built a document clustering model, clustering documents according to the topics contained in them, extracted through Latent Dirichlet Allocation which can be modified using user feedback.

AUV-IITK (AUTONOMOUS UNDERWATER VEHICLE) | Software Subsystems under Prof. K.S Venkatesh and Prof Sachin Y Shinde | December 2015 - December 2016 | Code*

- 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)** .
- Applied Pose Detection via SIFT and SURF Descriptors for an L-shaped gate, identifying the angle made by it.
- Applied Convolutional Neural Networks for pattern detection via Tensorflow.
- Used OpenCV library along with ROS framework to implement various object detection algorithms

INTRODUCTION TO MARKOV CHAIN AND HIDDEN MARKOV MODEL | Course Project mentored by Prof. Nitin Saxena | August 2016 - October 2016 | Presentation*

- Understood the Markov and Hidden Markov Models and the application of these models on speech recognition problem from the paper "An introduction to Hidden Markov Models" by Rabiner.
- Gave a **class presentation** introducing this topic and its application.

SENTIMENTAL ANALYSIS AND HANDWRITING RECOGNITION | ACA Project | February 2016 - April 2016 | Code* | Presentation*

- Classified movie reviews dataset part of NLTK corpus as positive or negative using Naive Bayes Algorithm.
- Did Handwriting Recognition on MNIST dataset using a feedforward neural network and tried quadratic, cross entropy and softmax loss function to improve accuracy.
- Did Facial Recognition using Principal Component Analysis in Matlab.

RELEVANT COURSES

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

* expected to be completed before April 2017

SKILLS

PROGRAMMING

Torch • Lua • Tensorflow • Matlab • OpenCV • Java • Python • C++ • LaTeX C • Numpy • HTML/CSS • Octave Arduino IDE • Github • Verilog • Assembly

POSITION OF RESPONSIBILITY

Editor, VOX POPULI | Journalism body of IIT Kanpur

- Moved Vox closer to people with articles voicing the opinions of the campus community and surveys.
- Lead articles on pressing issues like problems of PhD students, effect of coaching on IIT undergrads, statistical analysis of World University Rankings.
- Brought Vox to a larger scale by authoring an article that got published on **Business Insider** and **Times of India** .

EXTRA-CURRICULAR ACTIVITIES

Google Developer's Group

- Gave a talk on Computer Vision and its application in Robotics, attended by **more than 50 peers and juniors** .

Member, Robotics Club

- An active member of the club with numerous contributions towards the day to day functioning of the club.

- Prepared a voice recognition Bot for SnT day 2016.
- Presented AUV-IITK in an exhibition in Techkriti 2015, the annual Technical fest of IIT Kanpur.
- Took part in various robotics events like IRGT in Techkriti 2015, Robotricks in Takneek 2015.

President's Nominee Minimum Wage Monitoring Committee
- Took actions to reduce the **child labor** going on within the canteens inside different halls.
- Worked towards solving the issues and conflicts involving workers and contractors within the campus.