RAJAT AGARWAL

Email: rajat503@gmail.com
Homepage: http://rajat503.github.io

EDUCATION

Birla Institute of Technology & Science, Pilani – Goa Campus   **Aug 2013 – Present**
• **Majors**: B.E. (Hons.) Computer Science and M.Sc. (Hons.) Chemistry   **CS Major GPA:** 8.7/10.0

EXPERIENCE

Amazon | Bangalore, India   **Software Development Engineer, Intern**   **July 2017 - Dec 2017**

Infibeam.com | Ahmedabad, India   **Summer Intern**   **May 2015 - Jul 2015**

• Explored possibilities and gave recommendations on having a custom shell for a Java web-app written in Struts. Worked with Docker and ELK Stack.

Tesseract Imaging | Mumbai, India   **Software Developer (Contributor)**   **Oct 2014 - Jan 2015**

• Developed a web based viewer to render stitched images and videos in 360 at this startup from MIT Media Lab.
• Enabled navigation controls through gyro sensor and mouse panning by integrating it with webGL.
• Created 360 degree walk-through of places by linking images using ray tracing.
• Made a working prototype for 360 video viewing, 4 months before YouTube launched it.

PROJECTS

Deep Learning in TensorFlow   **May 2016 – Present**

1. Zero Shot Classification
    • Implemented zero shot classification for two classes of CIFAR-10 dataset by training only on the remaining 8 classes.
    • Used shared representation for words and images by mapping images to their word vectors using a CNN as in *Socher et al. (2013)*
2. American Sign Language Recognition:
    • Trained a CNN for localization and detection of 24 alphabets in American Sign Language in a camera input.
    • Accuracy of 99% on localization and 98% on top-5 classification on test data - the highest among 15 teams in machine learning class of Fall 2016.
3. Implemented *Deep Convolutional Generative Adversarial Networks (DCGAN)* to generate handwritten digits by training the discriminator on MNIST.
4. Implemented *A Neural Algorithm for Artistic Style (2015)* for style transfer from a style image to a target content image.
5. Generated adversarial examples for a MNIST classifier using fast gradient sign method as in *Explaining and Harnessing Adversarial Examples (2015)*.
6. Trained a deep reinforcement learning agent to solve CartPole on OpenAI Gym.
7. Implemented standard papers for classification tasks on Google Street View House Numbers, MNIST and CIFAR-10 datasets.

Applied Parallel Computing - Siemens Corporate Research   **Aug 2016 - Dec 2016**

• Performed hotspot analysis to identify performance bottlenecks in the given sequential software.
• Improved performance by converting the sequential bottlenecks to parallel while maintaining synchronization using OpenMP.

AutolabJS: Assignment Autograder and Testing Framework   **Jan 2016 - Aug 2016**

• Enables instructors to offer real time autograded programming assignments while providing a standard test writing framework in Java.
• Evaluates the submissions in a distributed environment with load balancing and has a micro service for each application component.
• Implemented in Node.js, Socket.io, Bash, Java and deployed using Docker. Also open-sourced the project on GitHub.
• Deployed for OOP course with 170+ students in Fall 2016 and for multiple courses in future semesters.

Investigating the "wisdom of crowds" at scale   **Nov 2015**

• Collaborated with Dr. Sharad Goel from Stanford University to design tasks to investigate the Wisdom of Crowd effect using crowdsourcing.
• Poster published in *28th Annual ACM Symposium on User Interface Software and Technology, 2015.*

Connect4 AI   **Jun 2015 - Jul 2015**
• Developed a bot to play Connect4 against a user. Implemented in Java using Minimax tree.

SKILLS

Interests	Software Development, Machine Learning, Neural Networks, Computer Vision, NLP, Reinforcement Learning, Parallel Computing
Languages	C, Python, Java, Shell, PHP, JavaScript, MySQL, Assembly, CUDA
Tools	TensorFlow, Keras, scikit-learn, Numpy, OpenCV, Docker, Git, Flask, Node.js, Socket.io, Verilog

ADDITIONAL POSITIONS

Teaching Assistant - Machine Learning (BITS F464), Neural Networks and Fuzzy Logic (BITS F312)   **Jan 2017 - May 2017**
• Taught theory and designed the structure for Applied Machine Learning and Deep Learning portions of the two courses.
• Conducted lab sessions and office hours for 53 and 65 students respectively.
• Mentored students during the final project on sequence prediction for the Google SVHN dataset and binary semantic segmentation tasks using CNNs.
• Graded mid-term assignments, final projects and viva-voce performance.

Professional Assistant - Computer Programming (CS F111)   **Jan 2015 - May 2015**
• Mentored and graded 30 students on C and Bash programming during the lab sessions.