ADITYA RASTOGI

Contact No.: (+91) 7477725222
r.aditya0824@gmail.com
https://thunderinfy.github.io/portfolio/
https://github.com/thunderInfy

EDUCATION

Master of Technology
Indian Institute of Technology, Kharagpur
Computer Science and Engineering
Thesis: Improvements in Self-Supervised Learning
Advisors: Prof. Partha Pratim Chakrabarti, Prof. Aritra Hazra
GPA: 9.55/10
Graduated: May 2021

Bachelor of Technology (Honours)
Indian Institute of Technology, Kharagpur
Computer Science and Engineering
Thesis: Deep Learning Visualization
Advisors: Prof. Partha Pratim Chakrabarti, Prof. Aritra Hazra
GPA: 9.46/10
Graduated: May 2020

INTERNSHIPS

Goldman Sachs, Bangalore, India May'20-Jun'20
Summer Intern
Developed an end-to-end system to classify tickets received through emails, using multiple classifiers.

University of British Columbia, Vancouver, B.C., Canada May'19-Jul'19
Mitacs Globalink Research Intern
Topic: Pattern Matching in Trillion Edge Graphs
Advisor: Prof. Matei Ripeanu
Developed a pipeline to maximize lateral work reuse in the problem of approximate pattern matching in graphs in a distributed systems setting.

University of Sydney, Camden, Sydney, Australia Dec'18-Jan'19
Visiting Student Researcher
Topic: Facial Landmarks Detection
Advisor: Dr. Mehar Khatkar
Designed and compared different deep learning pipelines for detecting facial landmarks in different fish species for automatic monitoring of health of fishes in aquariums.

IIT Kharagpur – Sponsored by Shell India Pvt. Ltd. May'18-July'18
Summer Intern
Topic: Sensor Diagnostics
Advisor: Prof. Swanand Khare
Developed a Python application to perform acceptance-rejection sampling. Worked on gaussian-mixture models, dimensionality reduction and error distributions in general.

RELEVANT PROJECTS

AlphaZero from scratch in PyTorch for the game of Chain Reaction
(~1200 lines of code in Python)

- Used "Playout Cap Randomization" along with Monte Carlo Tree Search.
- Increased training efficiency using multiprocessing.

Switch Transformers from scratch in PyTorch for Machine Translation in NLP
(~800 lines of code in Python)

- Developed the switch transformers model in PyTorch, and tested it on the Multi30K dataset.
- Used BLEU Score Evaluation.

Evolutionary Algorithm to train a self-driving car on a two-dimensional racetrack in JavaScript
(~1000 lines of code in JavaScript)

- Developed racetracks and modeled car navigation using a neural network in JavaScript.
- Developed a LIDAR computer model for perception.
- Optimization is done using an evolutionary algorithm.

Self-Supervised Learning in Computer Vision (SimCLR and MoCo-V2)
(~700 lines of code in Python)

- Implemented the SimCLR and MoCo-V2 papers in PyTorch.
- Created a mini-imagenet dataset to test the models. The created dataset got cited in the G-SimCLR paper.
- Evaluated the MoCo-V2 algorithm on FastAI benchmark datasets.

Virtual Avatar Creation for Video Conferencing Systems
(~300 lines of code in Python)

- Developed a python application which creates virtual avatars using facial landmarks and appearance-based gaze estimation.
- Compared the latency and performance of the developed model with the first-order motion model paper.

Off-Policy Monte Carlo Control in Reinforcement Learning
(~500 lines of code in Python)

- Solved the racetrack problem in reinforcement learning using off-policy monte carlo control.
- Used an epsilon greedy behavioural policy. Wrote an article to explain the algorithm.
- Developed the racetrack environment in Pygame.

Policy Iteration in Reinforcement Learning
(~200 lines of code in Python)

- Solved the classic Jack's car rental problem in reinforcement learning, using the policy iteration algorithm.

Saliency Map Extraction in PyTorch (Explainable AI)
(~100 lines of code in Python)

- Implemented a pipeline in PyTorch to extract saliency maps.
- Also wrote an article and created a video on visual saliency methods.
- The written article was cited in a Berkeley Artificial Intelligence Research blog.

TEACHING EXPERIENCE

Teaching Assistant – CS60050: Machine Learning, IIT-KGP (Spring 2021)
Teaching Assistant – CS31005: Algorithms-II, IIT-KGP (Autumn 2020)

SKILLS AND EXPERTISE

Languages: Python, C, C++, JavaScript, Java, MATLAB
Libraries: PyTorch, Numpy, Scipy, Matplotlib, Keras, p5.js, TensorFlow

CERTIFICATIONS

- Neural Networks and Deep Learning: *Deeplearning.ai – Coursera*
- Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization: *Deeplearning.ai – Coursera*
- Structuring Machine Learning Projects: *Deeplearning.ai – Coursera*
- Mathematics for Machine Learning: PCA: *Imperial College London - Coursera*
- AI Summer School 2020: Google India

OTHER PROJECTS

Phone Call Automation and Webscraping using Selenium and Twilio API in Python
(~100 lines of code in Python)

- Developed a script which scraped a website to check for vaccine availability.
- Automated phone calling using Twilio's voice API.

File system implementation using File Allocation Table and Index Nodes
(~2000 lines of code in C++)

- Implemented file systems using File Allocation Table (FAT) and using Index nodes (Inode).
- Developed an API to communicate with the file system.

Implementation of a Simplified File Transfer Protocol
(~1000 lines of code in C)

- Implemented a simple file transfer protocol in C.
- Built an iterative TCP server, with a control and a data process.

Implementation of Cryptographic Algorithms
(~2000 lines of code in C)

- Coded one-round AES and DES algorithms for image and text encryption.

POSITIONS OF RESPONSIBILITY

- Mentored junior undergraduates under the Student Mentor Programme.
- Project Mentor: Mentored a junior undergraduate in an interdisciplinary project related to Aerospace Engineering, Time Series Analysis and Deep Learning

LANGUAGES

English: Full Professional Proficiency (Test Scores: TOEFL: 112/120)
Hindi: Native Speaker
Japanese: Beginner (~ JLPT N4 Level)