Konark Jain

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EDUCATION

INDIAN INSTITUTE OF TECHNOLOGY, GUWAHATI
BTech in Electronics and Electrical Engineering with Minor in Mathematics
Expected Apr 2020 | Guwahati, India
Major GPA: 8.56
Minor GPA: 8.31

MVN SCHOOL, ARAVALI HILLS
Grad. May 2016| Faridabad, India
Senior Secondary Result: 93.0%
High School Grade: 10.0

COURSEWORK

UNDERGRADUATE
Optimization Methods*
Speech Recognition and Coding*
Advanced Probability & Random Process*
Mathematical Statistics
Scientific Computing
Advanced Linear Algebra
Pattern Recognition & Machine Learning
Advanced Control Systems
Modern Algebra

MOOCS
Machine Learning
Deep Learning
Convolutional Neural Networks
Natural Language Processing
Bayesian Methods for Machine Learning
Reinforcement Learning
Data Structures and Algorithms
Matrix Methods in Data Analysis*
Ongoing Courses

SKILLS

Programming Languages:
Python • C++ • MATLAB
Python Libraries:
Tensorflow • Keras • PyTorch • Pandas
Web Technology:
HTML • CSS
Miscellaneous:
LaTeX• MySQL
Operating Systems:
Windows • Linux

EXPERIENCE

JP MORGAN & CHASE | Quantitative Research Intern
May 19 - Jul 19 | Mumbai, India
- Worked on topics of Machine Learning with outlier handling for Market Risk Prediction as a part of the Market Risk team.
- Developed various regression algorithms to estimate and replace very expensive services required by the firm for risk calculation in Commodities LOB.

THE UNIVERSITY OF SYDNEY | Research Intern
May 18 - Jul 18 | Sydney, Australia
- Developed the algorithm for Parallel Tempering on Bayesian Neural Nets and implemented it with multi-threading cutting down the running time to half.
- Run time was then further reduced by a factor of two by using surrogate assisted optimization.

DEFENCE RESEARCH AND DEVELOPMENT ORG. | Research Intern
Dec 17 - Jan 17 | New Delhi, India
- Developed a Convolutional Neural Network architecture for unconstrained face recognition on multiple datasets for real time applications.
- Performance of the network developed in Tensorflow matched the state of the art methods achieving close to perfect accuracy on some datasets.

DELHI TECHNOLOGICAL UNIVERSITY | Research Intern
May 17 - Jul 17 | New Delhi, India
- Classification of 20 activities could be achieved with record 94.22% accuracy for Human Activity Recognition for RBG-D video sequences.
- Developed a novel "Movement Polygon Mapping" technique of dimensionality reduction of 4D RGBD Video Sequences to a 1D vector.

PUBLICATIONS

• R. Chandra, K. Jain, R. Deo, S. Cripps, "Langevin-gradient parallel tempering for Bayesian neural learning" , accepted in Neurocomputing Journal 2019

• R. Chandra, K. Jain, A. Kapoor, "Surrogate-assisted parallel tempering for Bayesian neural learning" , in IEEE TNNLS (Under Review)

• D.K. Vishwakarma and K. Jain, "Human Activity Recognition using Movement Polygon in 3-D Posture Data" , in IEEE Transactions on Human-Machine Systems (Under Review)

POSITIONS OF RESPONSIBILITY

IITG.AI | Co-Founder
Apr 18 – Present | Guwahati, India
IITG.ai is the AI community of IIT Guwahati for nurturing talent among the students and to establish collaborative projects with experts all around the world.

CEPSTRUM | General Secretary
July 19 - Present | Guwahati, India
CEPSTRUM is the student body of the Department of EEE, IITG. My duties include spearheading a 40 member team to perform various departmental activities.

CODING CLUB IITG | Machine Learning Head
Apr 18 - Apr 19 | Guwahati, India
Supervision of the projects undertaken by the coding club of IITG in the fields of Machine Learning, Deep Learning and Artificial Intelligence.

PROJECTS

FINGERPRINT ANTI-SPOOFING USING DEEP LEARNING
Biometrics and Computer Vision

Bachelor's Thesis Project under Dr. K. Karthik - Ongoing

- Developing a differentiating statistic between a spoof fingerprint and of that of a real person.
- Utilising the feature extraction capabilities of Convolutional Neural Networks to develop a robust fingerprinting recognition system against modern spoofing techniques.

REINFORCEMENT LEARNING FOR MINECRAFT
Reinforcement Learning

NeurIPS Challenge - July'19 - September'19

- The task was to develop a sample efficient reinforcement learning (RL) algorithm to train an agent on the Minecraft game.
- Researching on various meta-RL methods for this sparse rewards and hierarchical nature of the tasks.
- Developed and tested Options-Critic Algorithm and compared its performance with several baselines like Rainbow and DDQN.

GENERATIVE ADVERSARIAL NETWORKS (GAN) FOR FACE GENERATION
Generative Models

Self Project - January'19 - April'19

- Compared Vanilla GAN and DC-GAN for the task of generating face images from a small dataset.
- Researched on computational expense of GANs for small tasks and ways on how to improve it.

SELF BALANCING CYCLE
Control Systems and Robotics

Design Project Laboratory - January'19 - April'19

- Constructed from scratch a bicycle which was able to balance itself and move along a given path without falling. The project's motivation was the development of unmanned delivery systems for two-wheelers.
- Developed a novel technique of self-weight balancing by using PID Controllers to achieve self-stabilising action in the bicycle.

SIMILARITY MEASURES FOR SHORT TEXT COMPARISON
Natural Language Processing

Freelance Project - August'18 - December'18

- The task at hand was generating similarity scores between a customer query of a job and hundreds of options of CVs for finding the perfect match for the job. Challenges included short text nature of the query and scalability.
- Developed a software which uses word embeddings from pretrained word2vec algorithms and various similarity metrics for each option to find the best match. Keyword extraction performed over CV's text and scraped data from LinkedIn profiles.

BLOOD SMEAR IMAGE ANALYSIS
Computer Vision

Dimension Hackathon - January'18

- Used image processing techniques over images from a blood smear on a glass frame for detection of diseases like Malaria.
- The algorithm was able to report RBC, WBC and Platelet counts and thereafter reported a probability of being ailed by any of the five diseases we trained the model to detect.

AWARDS

2018	2^{nd} out of 15	Campus Entrepreneur Event, Kriti 2018
2015	Top 1% of the Nation	National Standard Exam in Physics
2015	Top 1% of the State	National Standard Exam in Astronomy
2014	Rank 77/50,000	National Fellowship for Young Scientists (KVPY)
2014	State Rank 1	National Talent Search Examination