Gaurav Mishra

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A-1 Type 3, District Hospital Campus, Basti, UP-272001, India

Education

Shiv Nadar University Greater Noida, UP (2015–2019)

-B.Tech. with distinction in Electronics and Communication Engineering, **CGPA: 8.50/10.00**

-85% Tuition Fee waiver, In top 10% ile of the class

City Montessori School, Gomti Nagar Lucknow, UP (2012–2014)

-Intermediate, 10+2 (Science+Computer Science), **Percentage: 90.0%**

Research Work Experience

Under Prof. Jayanthi Sivaswamy, Centre for Visual Information Technology, IIIT Hyderabad

Research Assistant (Jan 2019-Ongoing)

-Working on Asymmetry Analysis in brain MR Scans

-Explainable AI in healthcare

-Segmentation of different structures using Deep Learning

Under Prof. G.P.S. Raghava, Deptt. of Computational Biology, IIIT, Delhi

Long Term Research Intern New Delhi (Dec 2018-Dec 2019)

-Worked in Computational Biology Lab with Prof. Raghava and his senior scholars

-Independent research work on multiple projects related to Machine Learning

-Assisted the researchers on Machine Learning projects, completed my undergraduate dissertation

Under Prof. RN Biswas, Embedded Systems Lab, Shiv Nadar University

UG Teaching and Research Assistant for course Embedded Systems Greater Noida, UP (Aug 2018 - Dec 2018)

-Created new experiments for a 3rd year course 'Embedded Systems Hardware'

-Worked on protocols such as SPI, I2C, etc. and peripherals such as RFID on ARM based STM32

-Assisted Prof. R.N. Biswas in lab

Publications

Peer-Reviewed Journal

•Piyush Agrawal, **Gaurav Mishra**, and Gajendra PS Raghava. Sambinder: A web server for predicting sam binding residues of a protein from its amino acid sequence. *Frontiers of Pharmacology*, 2019

•Sumeet Patiyal, Piyush Agrawal, Vinod Kumar, Anjali Dhall, Rajesh Kumar, **Gaurav Mishra**, and Gajendra PS Raghava. Nagbinder: An approach for identifying n-acetylglucosamine interacting residues of a protein from its primary sequence. *Protein Science*, 2019

Conference

•**Gaurav Mishra**, Urvi Ahluwalia, Karan Praharaj, and Shreyangi Prasad. Rf and rfid based object identification and navigation system for the visually impaired. In *2019 32nd International Conference on VLSI Design and 2019 18th International Conference on Embedded Systems (VLSID)*, pages 533–534. IEEE, 2019

Archival(under review)

•Akshara Pande, Sumeet Patiyal, Anjali Lathwal, Chakit Arora, Dilraj Kaur, Anjali Dhall, **Gaurav Mishra**, Harpreet Kaur, Neelam Sharma, Shipra Jain, et al. Computing wide range of protein/peptide features from their sequence and structure. *bioRxiv*, page 599126, 2019

Projects

Brain Asymmetry Analysis using DL and Image Processing (Under Prof. Sivaswamy, Ongoing)

-Working on studying how quantifying asymmetry in brain on structural basis can lead to disease diagnosis

-Population meta-analysis also to be done to study how brain asymmetry varies across population, sex and demography

-Usage of Deep Learning and Image Processing to study the same

Explainable AI in Medical Diagnosis (Under Prof. Sivaswamy, Ongoing)

-Using Deep Learning paired with novel training methodology to make decisions explainable

-Tackling with the constraints of shortage of annotated images by designing novel training methodology which aids weakly supervised segmentation

-Working on DMEs and mammograms to detect breast cancer mass using Deep Learning

-*Implemented in Pytho*

Machine Learning in Drug Discovery and Computational Biology (Under Prof. Raghava, Dec'18-Dec'19)

-Project Title: In-Silico Drug Discovery using Protein-Small Molecule Interaction

-Employed Machine Learning to predict binding sites in a protein sequence to aid drug discovery

-Applied feature extraction, feature reduction and then applying Machine Learning techniques

-The ligand is Uridine 5'-diphosphate which is responsible for many metabolic functions in the body, *Implemented in Python*

Feature Generation in Protein and Peptide Sequences(repo) (Guide: Prof. Raghava's Group,Dec'18-Dec'19)

-Extracted features from protein and peptide sequences which can later be used in predictive analyses

-Launched an open source web server Pfeature, standalone, and executables. *Implemented in Python*

Ensemble Learning for Regression Analyses (Guide: Prof. M Gopal , Monsoon 2018)

-Employed Ensemble Learning methods to Regression Problems

-Compared performance of existing methods (like SVM, Neural Network) with Ensemble Methods

-Used feature importance and feature reduction using Ensemble Methods

-Dataset used: Boston Housing Dataset, *Implemented in MATLAB*

RFID based Object Identification and Navigation (repo) (Guide: Prof. RN Biswas, Spring 2018)

-Designed a novel method to help Visually Impaired using RF and RFID

-Use of RF to create a Virtual Acoustic Space which helps the visually impaired to locate the desired object *Used C programming*

Prediction of Food Waste from Dining Halls using Machine Learning

-Used ML to predict how much food is going to be wasted on a particular day, developed for Azure Hospitality

-Using the tool, the hall managers decreased the amount of food to be cooked depending on the prediction

-Resulted in significantly less food wastage, *Implemented in Python*

Crop Disease Classification using Deep CNNs (repo)

-Used Deep Learning to classify crop disease using a leaf image, Used Transfer learning for pre-training

-Neural Network trained on over 20000 images belonging to 15 classes of crop disease

-The model will be deployed as an open source web app to assist farmers, who can upload leaf image and get the disease type.

Cancer Classification of Pigmented Lesion Images using Residual Neural Networks

-Aim of this project is to achieve state-of-the-art metrics in detecting type of skin cancer using lesion image

-The usability of ResNets will be checked, as it gives better results in image classification

-Working on HAM10000 dataset to detect the type of skin cancer, *Implemented in Python*

Annual Household Income Prediction using Machine Learning (Guide: Prof. M Gopal, Spring 2018)

-Used Machine Learning to determine Annual Income of a household using various socio-economic attributes

Teaching Experience

-TA for Graduate Physics, 1st year course (Fall 2016), Under Prof Syed Kamil

-TA for Graduate Mathematics, 1st year course (Spring 2018), Under Prof Ajit Kumar

-TA for Introductory Physics and Maths for Freshmen(Summer 2018), Under Prof Amber Habib

-TA and Lab Assistant for Embedded Systems, 3rd year course (Fall 2018), Under Prof RN Biswas

-Mentor for Hindustani Classical Music evening classes

Relevant Coursework (Select)

University Courses

-Applied Machine Learning, Computational PDE, Mathematical Methods, Probability and Statistics, Dynamical Systems, Data Structures, Digital Signal Processing

Online Courses

-Neural Networks and Deep Learning by deeplearning.ai on Coursera, Certificate Number: LESLBWYD83TD

-Mathematics for Machine Learning Specialisation by Imperial College London on Coursera, Certificate Numbers: 5FTA53CZML87, JGH533XCZR4D

-Introduction to TensorFlow, Convolutional Neural Network in Tensorflow on Coursera

-Machine Learning by Stanford University on Coursera, Instructor: Prof. Andrew Ng

-Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization by deeplearning.ai on Coursera, Certificate Number: 66FSVSA2JK7S

Miscellaneous

Technical Skills	Python, Shell Scripting, MATLAB, C, LaTeX
Frameworks	Keras, scikit-learn, Tensorflow, Numpy, Pandas, Librosa, OpenCV
Research Interests	Artificial Intelligence, , Explainable AI, Computer Vision, AI in Healthcare
Languages	Conversational and Written Proficiency in Englsh, Hindi and Bhojpuri
Interests	Classical Music, Photography, Cooking
Profiles	github, ResearchGate, LinkedIN, Google Scholar

Leadership Opportunities

Food Committee, Dean of Student Welfare Office, Shiv Nadar University

Chairperson (Head) Greater Noida, UP (May 2018 - May 2019)

-Headed food related jobs and problems throughout the campus with 2500 people

-Organised first **Food Fest** which raised around 1.8lacs INR (2600 USD) in one day

-Negotiated and helped in opening new food outlets at campus, tendering and framing contracts

Spic Macay SNU Chapter

Secretary (Head) Greater Noida, UP (Mar 2018 - Mar 2019)

-Managed a chapter of 100+ members, organising events involving reputed Indian Classical exponents

-Head of Logistics, Finance, Hospitality and Publicity Team

Snuphoria-The Music Society

Head of Indian Music — Greater Noida, UP (Feb 2017 - Jan 2018)

-Head of Indian Wing of the Music Society, responsible for managing representations in Indian Music

-Organised events with ample representation of Indian Music

-Mentored Hindustani Classical Music classes for 3 consecutive terms

References

Prof. Gajendra P.S. Raghava

-Head, Centre for Computational Biology, IIIT Delhi

-e-mail: raghava@iiitd.ac.in, Tel:+91-11-26907444

Piyush Agrawal, Ph.D.

-Post-Doctorate Researcher, National Institue of Health, USA

-e-mail: piyush_11@imtech.res.in

Akshara Pande, Ph.D.

-Associate Professor, Department of Computer Science, Graphic Era Hill University, Dehradun

-e-mail: apandey@gehu.ac.in

Rajiv Swarup

-President, Shiv Nadar University

-email: rajiv.swarup@snu.edu.in