Arnav Ahuja

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Education

- **Birla Institute Of Technology and Science, Pilani, Rajasthan, India** *2018-2023*
  Bachelor of Technology Computer Science
  Master of Science in Mathematics (Dual Degree)
  Overall CGPA: 7.94/10
- **St Xavier's School, Jaipur** *2017-2018*
  All India Senior School Certificate Examination (Class XII)
  Percentage: 95.6%

Research Experience & Internships

Website Agnostic Crawler User Action Automation ***Amazon***
Team:Selection Monitoring *Present*

- **Analyzed web domain data** for competitor e-commerce websites..
- Utilized **AWS resources like Sagemaker, S3, Stepfunctions** to create baseline models for web domain data.
- Constructed a **Reinforcement Learning** based approach for user action automation in the web crawler.

Identifying Disease Using Machine Learning ***BITS Pilani***
Guide: Prof. Sundaresan Raman, Department of Computer Science *Spring 2022*

- Analysed **single nucleotide polymorphism** data for identifying the susceptibility to **diabetic retinopathy**.
- Implemented **Lasso Regression and Random Forest algorithm for feature selection** in SNPs.
- Used **machine learning algorithms like kNN, SVM, Gradient Boosted DT** for predicting the susceptibility.

Virtual Hover Pen for Devanagari Script ***BITS Pilani***
Guide: Prof. Mukesh Kumar Rohil, Department of Computer Science *Fall 2021*

- Created a virtual hover pen application with support for multiple user features using **openCV library**
- Integrated support for **hindi language recognition** of text written with hover pen
- Trained an encoder decoder model with **ResNet as encoder and LSTM decoder**

Crop Disease Identification ***BITS Pilani***
Guide: Prof. Jennifer Ranjani, Department of Computer Science *2020*

- Developed a **new Inception Resnet deep learning architecture** to identify diseases in the leaf of tomato plant
- Achieved an **accuracy of 98.16%** which is higher than the traditional resnet model (97.5%)
- Created a new dataset of real images using **data augmentation** which significantly increased the accuracy

Earthquake Forecasting ***BITS Pilani***
Guide: Prof. Sumanta Pasari, Department of Mathematics *Fall 2020*

- Analyzed **time series data of earthquakes** in five different regions to extract the seismicity information
- Implemented a neural network **model which forecasts earthquakes** using seismicity indicators in the regions
- Achieved an **accuracy of 90.4%** for forecasting the probability of an upcoming earthquake in the Himalayas

Facial Recognition Based Attendance System ***TNHSR***
Guide: Dr. Viduthalai, IT Expert *Summer 2020*

- Developed a **facial-recognition based attendance system** to help curb the spread of COVID-19
- Used **openCV library** (**Haar Cascade Algorithm**) for facial recognition
- Presented the results to the senior stakeholders in the company

Publications

- **Use of spatio-temporal features for earthquake forecasting of imbalanced data**.
  International Conference on Intelligent Innovations in Engineering and Technology (*ICIIET*). Accepted
  Arnav Ahuja, Aaditya Sharma, Sumanta Pasari
- **Disease Identification in Tomato Leaf using pre-trained ResNet and Deformable Inception**.
  5th International Conference on Computational Intelligence in Data Science. LINK
  Arnav Ahuja, Jennifer Ranjani, Aditya Tulsyan

- **Forecasting Earthquakes Using Neural Network Models**.
  (*Springer Nature*) *Disaster Management in Complex Himalayan Terrains - Natural Hazard Management, Methodologies and Policy Implications.* LINK
  Arnav Ahuja, Sumanta Pasari

Miscellaneous Projects

Epidemiological Analysis of COVID-19 *Spring 2020*

- Analyzed COVID – 19 data with respect to the **SIR epidemic model of disease spread**
- Estimated the defining characteristic parameters of the model by **minimizing squared error loss**
- Calculated the **reproductive number to be close to 1.2**

English to Hindi Language Transliteration *Summer 2020*

- Trained an **Encoder-Decoder model** which transliterated English alphabets to Hindi language font
- Deployed **Gated Recurrent Units with attention mechanism** to enhance the performance of the model

Occlusion Analysis & Filter Visualization *Summer 2020*

- Analyzed the filter in a CNN for detecting the important parts of an image
- Performed **occlusion sensitivity analysis** on various images

Technical Skills

Programming Languages	- C, C++, Java, Python, MATLAB, SQL
Data Science Libraries	- PyTorch, TensorFlow, Keras, Pandas, Numpy, openCV
Machine Learning	- CNNs, RNNs, GRUs, LSTMs, Encoder-Decoder Models
Platforms/Tools	- Jupyter Notebooks, Google Colab, Visual Studio, NetBeans, Eclipse, Ubuntu MATLAB, Unity, Blender

Extracurricular Activities

- **Member of Student's Academic Council** - Organized various talks and activities to augment the academic and research culture of the campus [*2020-2022*]
- **Class Head of 8th standard (NSS)** - Supervised all class 8th activities; prepared schedules for all students and volunteers [*2019-2020*]
- **Volunteer at National Service Scheme (NSS)** - Mentored underprivileged students and tutored them on their curriculum subjects [*2018-2020*]
- **Game Developer at Coding Club** - Developed several games on the unity platform as well as designed the characters on the blender platform [*2018-2019*]

Relevant Coursework

- *Computer Science* - Data Structures and Algorithms, Database Management Systems, Microprocessors and Interfacing, Object Oriented Programming, Logic in Computer Science, Digital Design, Computer Programming
- *Mathematics* - Operations Research, Graphs and Networks, Optimization, Applied Stochastic Processes, Discrete Mathematics

Online Courses

- **Neural Networks and Deep Learning** (deeplearning.ai - Coursera)
- **Improving Deep Neural Networks** (deeplearning.ai-Coursera)
- **Structuring Machine Learning Projects** (deeplearning.ai-Coursera)
- **Convolutional Neural Networks** (deeplearning.ai-Coursera)
- **Sequence Models** (deeplearning.ai-Coursera)
- **Foundations of Data Science** (OneFourthLabs)
- **Deep Learning** (OneFourthLabs)
- **Algorithmic Toolbox** (University of California - Coursera)