**** **M KRISHNAKANT ACHARY**

Agricultural and Food Engineering | IIT Kharagpur

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| **EDUCATION** | | | |
| **Year** | **Degree/Exam** | **Institute** | **CGPA/Marks** |
| 2021 | Bachelor & Master of Technology (Dual Degree) | Indian Institute of Technology, Kharagpur | 8.48/10 |
| 2015 | Central Board of Secondary Education (CBSE) | Jawahar Navodaya Vidyalaya-1, Malkangiri | 91% |
| 2013 | Central Board of Secondary Education (CBSE) | Jawahar Navodaya Vidyalaya-1, Malkangiri | 10/10 |

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| **INTERNSHIP** |
| **Nippon Koei Co., Ltd., JAPAN Data Science Intern May’19 – July’19** |
| • Analyzed the effect of **climatic change** on rice production in Punjab and Odisha and proposed unique adaptive solutions for both areas.  • Created five different **weather parameters** from raw weather data and **calibrated threshold** levels for loss in rice production.  • Learned various **Bias-correction** methods and corrected the Near-surface Specific Humidity bias for six GCM's weather data.  • Analyzed **humans' survivability** in New-Delhi, due to increasing wet-bulb temperature during summer by the end of the 21st century. |
| **IIT Kharagpur Machine Learning Intern May’20 – July’20** |
| • Applied **Tchebichef moments** for quantitative analysis of soil components, i.e., Nitrogen, carbon, and LOI, based on raw NIR spectra.  • Applied **Tchebichef Moment-Partial Least Squared regression** (TM-PLS) and compared the results with i-PLS and PLS regression results.  • Preprocessing steps included removing the outliers, converting the raw spectral data into **Grayscale images**, extraction of the orthogonal moments using **tchebichef polynomial**, scaling the moment values, and feature selection for TM-PLS regression.  • The obtained R2 scores for test data of size 60 were **83.1%, 82.1%, and 76.6%**, from the TM-PLS method, in estimating N, C, and LOI. |
| **PROJECTS** |
| **B-tech Thesis: Risky Years for Rice Production Analysis and Predictive Irrigation Scheduling July’19 – April’20** |
| • Estimated the **risky years** for Rice production from 2020 - 2069 of West Bengal, by calibrating weather parameters on historical data.  • Identified the **cause of loss** in those Risky years and proposed methods for minimizing the loss, adaptation, and mitigation.  • Simulated the **Rice crop yield** for the Kharagpur region with different planting dates for years from 2040 - 2069 in DSSAT software.  • Designed a **predictive** **irrigation scheduling system** based on the iterative approach of finding Available soil water using the weather data. |
| **Topic: A strategy to apply machine learning to small datasets June’20 – Oct’20** |
| • Designed a **two-step sequential machine learning** model to improve the accuracy for a small dataset and compared it with an ANN model.  • Worked primarily on eye-tracking data from Tobiie pro eye sensor to estimate the **Reaction Time**, while playing Virtual Reality games.  • Each layer of the neural network was pre-trained using **autoencoders**, and the pre-trained weights are used for final training.  • The obtained R2 scores for the ensemble sequential model was **91.34%,** whereas the R2 score for the trained ANN model was **84.65%.** |
| **Topic: Developing Cognitive Load Evaluation Model Jan’20 – May’20** |
| • Built an algorithm that uses the **Probabilistic Neural Network** to estimate the Cognitive load while playing Virtual Reality games.  • The data was preprocessed by dividing into four clusters using **K-means clustering** and mapping each feature values in the range of 0-1.  • Effectiveness tested on the collected user review data showed an absolute error and relative mean squared error of **10.7%** and **23.3%.** |
| **Topic: Bengali digit recognition model using CNN Feb’20 – Mar’20** |
| • Developed a Convolutional Neural Network for recognition of Bengali Digits by modifying, training, and optimizing **LeNet architecture**.  • The samples used for training were rotated uniformly between -45 to 45 degrees to account for better generalization and accuracy.  • Stochastic gradient descent optimizer and cross-entropy loss were used, which obtained **92.3%** accuracy on the test dataset. |
| **COMPETITIONS** |
| **Topic: Prediction of Customer Response for a Personal Loan Scheme Nov’19 – Jan’20** |
| • Developed predictive model using TVS credit two-wheeler loan dataset to identify responders for a newly released personal loan scheme.  • Various Machine Learning models such as Random Forest, XGBoost, KNN, Cart 4.5, and Neural Networks were used for classification.  • The dataset was balanced by under-sampling, followed by an ensemble bagging technique to get a generalized model for all data points.  • The responders predicted using a bagged XGBoost classifier with Tenfold Cross-Validation showed an F1-Score of 84%. |
| **Topic: Detection of COVID-19 using Chest X-ray May’20 – June’20** |
| • Implemented a **CNN model** for the classification of COVID-19, viral pneumonia, and bacterial pneumonia from images of chest X-rays.  • Achieved top 5% result in the class of 250 by using data augmentation, transfer learning and ensemble model with **96% F-1** score. |
| **POSITION OF RESPONSIBILITY** |
| • **Vice-captain** of the table tennis team of LLR hall: Individually trained the juniors by conducting regular practice session for GC 2019-2020.  • **Network manager of ShARE-Global think tank** ,IIT Kharagpur, leading a team of 10 members working in Sustainable Energy section. |
| **SKILLS AND EXPERTISE** |
| **Programming Languages:** Python, C++, C, R **Tools:** SQL, Git, Tensorflow, PyTorch, Keras, Scikit-learn, Ensemble Learn, C++ STL  **Softwares:** Visual Studio Code, MS Office, Linux (Ubuntu), AutoCAD, Solid Works, Adobe Photoshop, DSSAT, EES, ArcGIS |
| **COURSEWORK INFORMATION** |
| **Computer Science Courses:** Programming and Data Structure | Data Analytics | Deep Learning Foundations and applications | Regression and Time Series Modelling | Applied Machine Learning in Python | Deep Learning with Python and PyTorch | Algorithmic Toolbox  **Other Courses:** Probability and Statistics | Partial Differential Equations | Financial Management | Economics | Marketing and Market Research | CAD and Simulation of Agricultural Machinery | Modelling of Extreme Events | Agricultural System Modelling |
| **AWARDS AND ACHIEVEMENTS** |
| • Achieved **Six-stars** under problem solving skill and **Five-stars** under C++ by solving 150+ coding problems in Hackerank.  • Secured a percentile of **97.22** among a total of 1.5 million candidates that appeared for Joint Entrance Examination (JEE) Main 2016. |
| **EXTRA-CURRICULAR ACTIVITIES** |
| • Designed and patented various improvisation for **Amber charkha** for **doubling productivity**, reducing breakage during operation.  • Member of the National Service Scheme, IIT Kharagpur, which conducted various medical camps and classes for children of Porapara.  • A vital player of the inter hall **Bronze winning** table tennis team in the general championship, IIT Kharagpur, for the session 2017-2018. |