Ashwani Kumar

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ACADEMIC DETAILS

Degree	Year	Institution	Grade/Percentage
B.tech	2016-2021	Indian Institute of Technology, Kanpur	58%
12th	2015	DAV College	88.60%
10th	2013	DAV College	83.80%

SCHOLASTIC ACHIEVEMENTS

- Selected for INSPIRE scholarship, awarded to the top **1% among 5.3lakh** students by Department of Science & Technology.
- **2nd Position** in Aviation Development Competition 2019 at IIT Kanpur.

KEY PROJECTS AND INTERNSHIP

- **Field Inversion and Machine Learning** *Final Year, Project supervisor: Dr. Rajesh Ranjan* Apr'21-'July21
  - Used Field Inversion Method and Machine Learning to improve the CFD model. Used 2-Equation **K-omega model**
  - Used **tanh clustering** for meshing, applied central finite difference method to get the second derivatives.
  - implemented under Relaxation method to Evaluate Linear Equation the K and Omega correction equations.
  - MSE loss function for Field Inversion and implemented **Bolt Drive Method** for Optimization and Used Discrete Adjoint method to calculate derivatives of loss function.
  - Designed 3 Neural Networks and Machine leaning model and compare their performance.
- **Image Processing** *(Self Project)* Jan'21-Aug'21
  - **Brain MRI Segmentation** Used Kaggle Public lgg segmentation dataset. The dataset had only 4k images, used Keras in built IDG for augmentation. Built a small unet with 31million parameters. used custom loss functions Dice Coefficients and Jaccard index. Final model trained for 30 epochs had **size of 335MB** and **0.98 binary, 0.72 IOU, 0.82 Dice accuracy** on Test Set.
  - **Intel Image Classification** Used Intel Image Classification Dataset on kaggle. Dataset has 14k images. Created a smalle subset of dataset and Used Keras in built IDG for smooth training. Built model with **0.3 million parameters**. Model trained for 30 epochs had accuracy of **0.94 on training, 0.89 on val set and 0.79 on test set**
- **Chit-Chat and Stack-Overflow Assistant**:*(Coursera Course Project)* Aug'20-Dec'20
  - Developed and hosted conversational ChitChat-Bot on Telegram, which could also share StackOverflow threads. Project Had two parts Intent and Language recognition.
  - Used **TF-IDF vectorizer** and Logistic Regression for Intent recognition and Tag Classification.
  - To find relevant answer to query Trained **Facebook's Starspace** word embeddings on the given corpus.
  - For Dialogue System Trained **Hierarchical Encoder Decoder Model Used Bi-GRU** as Encoder and GRU for Context and Decoder, Hyperbolic Tangent used as Activation Function.
- **Design and Modelling Internship** May'18-July'18
  VTOL Aviation India Pvt Ltd.
  - Worked as a part of Propulsion Team Analyzed the Rotor Performance to achieve **optimal Power Consumption** of **India's First AirTaxi(900kg)**, also worked on landing gear of 50kg UAV.
  - Developed simulation codes on MATLAB Using **BEMT** to predict the Performance parameters of the rotor.
  - Developed Codes on Visual C++, Used Lab-View to test the sensors of Test-Bench of The Bird.
- **Data Handling***(Mentor: Dr. Abhijit Kushari))* Jan'19-'April'19
  - Collected 1000 of data points with the help of LABView software and applied preprocessing to it.
  - Calibrated Physical Quantities (pressure,velocity) with Voltage measured(on device), by plotting curves on Python.
- **Other Self Projects**
  - **Battle of Neighbourhood,Housing Price Prediction, Toxic Comment Classification, Sentiment Analysis, Movie Review, Neural Style Transfer, Simon Game(Web), Pong Game(Python), Blog Website, Instagram Bot**

TECHNICAL SKILLS AND TOOLS

- **Languages** :**C++**, **JAVA**, HTML5, Matlab, **Python**, SQL, JS, CSS, Octave.
- **Tools and Skills** : Auto-desk, Machine Learning, NLP, Image Processing Deep Learning, Web Dev(Front), Git, Selenium.

RELEVANT COURSES

- **Institute Courses:** Fundamentals of Computing, **Linear Algebra**, **Finite Element Method**, Aircraft Propulsion, **Thermodynamics**, Optimal Space Flight Control, Modern Control System,Rocket Propulsion. Helicopter dynamics
- **Online Courses** Machine Leaning, **IBM Data Science**, **Deep Learning Specialization**, Complete Web Development, Python Code challenge.

EXTRA-CURRICULAR

- Mentored Students of Various Colleges in **Boeing National Aeromodelling Festival'17**
- Participated in **Techniti17** Aeromodelling Competiont 'Sky Sparks'.
- Volunteered in the National Service Scheme to provide education to underprivileged children in school.
- Participated in **BCG** virtual Experience Worked on Churn Prediction Model From Scratch.