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M.Tech.  
Gender: Male  
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Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2022	7.77
Graduation	Dr. APJ Abdul Kalam Technical University	Harcourt Butler Technological Institute	2019	69.12%
Graduation Specialization: Electrical Engineering				

## AREAS OF INTEREST

Data Science | Computer Vision | Natural Language Processing | Deep Learning | Machine Learning

## SCHOLASTIC ACHIEVEMENTS

- Secured **AIR 253** in **GATE-2020 (Electrical Engineering)** among 93,526 candidates
- Secured **AA grade** in **Applied Predictive Analytics** course

## MAJOR PROJECT AND SEMINAR

- M.Tech Project: Predictive Modelling and Maintenance for Distribution Network**  
*Guide: Prof. PSV Nataraj, System and Control Engg., IIT Bombay* (June'21 - present)
  - Objective:** **FDD** (Fault Detection and Diagnosis), **Anomaly detection** and **RUL Prediction** for Engineering Systems using **MATLAB**.
  - Working on **DC Motor Toolkit** and **Hybrid Two Tank System** for FDD of software and hardware faults using **Predictive Maintenance** and **Deep Learning Toolbox** of MATLAB
  - Deploying **ML and DL models** for anomaly detection and condition monitoring of system
  - Predicting RUL using identified models or specialized RUL estimator models
  - Impact:** Creating a **dashboard** for **real time machine health monitoring** to plan maintainance in advance for eliminating unplanned downtime
- M.Tech Seminar: Deep Reinforcement Learning and Model Free Control** (Sept'20 - Dec'20)  
*Guide: Prof. PSV Nataraj, System and Control Engg., IIT Bombay.*
  - Understood the basics of RL, Model free control, Policy optimization and Q learning method
  - Studied policy, value functions, exploitation & exploration, **multi arm and contextual bandits**
  - Conducted a literature review and understood the implementation of **Policy gradient and DQN**

## KEY PROJECTS

- Fault Diagnosis of Rolling Bearing using Hybrid DL model** (June'21)  
(Self Project)
  - Used vibrational dataset of CWRU bearing dataset to classify into different operating conditions
  - Applied **Continuous Wavelet Transform (CWT)** for converting vibrational signal into images and used **CNN** architecture to extract features
  - Used Random Forest Classifier to classify the signals and achieved **95%+** accuracy
- Emoji Prediction for a Phrase** (June'21)  
(Self Project)
  - Performed **EDA** and built the embedding matrix for text in dataset using **GloVe vector**
  - Deployed and trained **LSTM model** as text classifier for emoji prediction
  - Evaluated the model using categorical cross-entropy as loss function and Adam as optimizer
- Briefking** (June-July'21)  
(Summer of Code, IIT Bombay)
  - Used moviepy library to extract audio from a video file
  - Compared outputs of python libraries & pre-trained deep learning models for denoising audio
  - Analyzed results of various DL models for speech-to-text conversion and selected **Bert Trans-former model**

- **Prediction of Air Quality Index (PM 2.5) using Various Regression Techniques** (July'21)  
(Self Project)
  - Analyzed underlying trends in AQI based on **Visualization** and **Exploratory Data Analysis**
  - Applied ML algos like **Decision trees, Random forest, Xgboost** to achieve **RMSE** of **36.8  $\mu\text{g}/\text{m}^3$**
  - Used **RandomizedSearchCV** of **Scikit-learn** for hyperparameter tuning of models
- **Predicting Loan Approval Status using Machine Learning** (July'21)  
(Self Project)
  - Applied various ML techniques to perform classification on **Kaggle dataset** of **Loan Prediction Problem** and achieved the best accuracy of **80%** with Logistic Regression
  - Performed data imputation and extracted new features for improved performance

## PUBLICATIONS

- R. Sachan, N. Kumar, **A. Arvind**, A. K. Arya and S. Kumar, "Reduced Switch Count 36 level Inverter for Open End Winding Induction Motor Drive," 2019 2nd International Conference on Power Energy, Environment and Intelligent Control (PEEIC), 2019, pp. 180-185

## ONLINE COURSES

- Google Data Analytics Professional Certificate | (Coursera) (Jan-Aug'21)
  - Data Cleaning, Data Analysis, Data Visualization, Tableau, R, MySQL, Google Spreadsheet.
- Deep Learning Specialization | (GUVI) (Jan-July'21)  
*Instructor: Prof. Mitesh Khapra and Prof. Pratyush Kumar, IIT Madras*
  - FNN, CNN architectures, optimization algorithms and sequence models using PyTorch, Tensorflow, Keras.
- Foundations of Data Science | Guvi (Feb-July'21)  
*Instructor: Prof. Mitesh Khapra and Prof. Pratyush Kumar, IIT Madras*
  - Descriptive and Inferential Statistics, Probability Theory and Hypothesis Testing
- SQL for Data Science | Coursera (Offered by University of California, Davis) (Jan-Feb'21)
- Machine Learning Specialization | Coursera (Offered by University of Washington) (Jan-April'21)

## POSITIONS OF RESPONSIBILITY

- **Department Placement Coordinator | Placement Team, IIT Bombay** (Aug'21-present)
  - Pitching the skills and projects of SysCon department students to companies of different sectors and domains
  - Smoothly executed the online resume verification processor for **1800+** students as a part of team with **65+** DPCs
  - Mentoring students for resume verification process and conducting 20+ Coding Tests, Aptitude Tests, Buddy Talks and GD's
- **Interview Coordinator, IIT Bombay** (Nov-Dec'20)
  - Coordinated with a team of **250+** members for interviews of **1700+** students
  - Assisted in conducting Tests for **15+** firms and handling student queries
- **Teaching Assistant, SysCon Department, IIT Bombay** (Aug'20- present)

## RELEVANT COURSES

- |   |  |
|---|--|
| • Machine Learning for Remote Sensing II            | • Introduction to Probability and Random Processes |
| • Applied Predictive Analytics                      | • Optimization                                     |
| • Modelling and Identification of Dynamical Systems | • Advanced Process Control                         |

## SKILLS

- **Languages/Libraries:** C++, Python, R, Tensorflow, Keras, Pytorch, Scikit-learn, NumPy, Pandas etc
- **Tools:** Tableau,  $\text{\LaTeX}$ , R, MATLAB