Sudhir Shinde

Curriculum Vitae

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Education

2017–2020 **M.Tech**, *Computer Aided Design and Manufacturing, Indian Institute of Technology (IIT), Bombay (India), CPI **9.45/10***.

2016 **B.Tech**, *Savitribai Phule Pune University, Pune, India **79.67%***.

Research summary

M.Tech Research **Defeaturing of 3D CAD Models using Deep Learning**

- Worked with **Prof S.S. Pande** to create Deep Learning model for feature recognition and to decide the present/absent of feature for improvement in design and saving computational time
- Developed a system to generate 10K 3D models with distinct topological features in **Python**
- Feature recognition and extraction is done by unsupervised ML algorithm (DBSCAN)
- Developed a GUI in **Visual Studio** using MFC application in **C++** for feature recognition

Internship Experience

May'19-Aug'19 **Machine Learning Engineer Intern, Fabguard Services**

- Designed a concept based deep learning framework to identify anomalies in objects, trajectories, and actions & trained in **PyTorch** framework.
- Studied deep learning based latest research papers to improve the accuracy of the models

Jan'19-Apr'19 **Research Consultant, WorldQuant Research India Pvt. Ltd.**

- Developed mathematical models (alphas) based on long-short trading strategies for weighing stocks in a portfolio in order to optimize the same by attaining high returns with low volatility
- Researched various algorithms and strategies for enhancing the efficiency of alphas

Course Projects

Machine Learning **Machine Learning based Image Classification System to Analyze Changing Fashion Trends**

- Developed the shirt classification system using **KNN, SVM, CNN** with **Scikit-Learn** and **TensorFlow**
- Pre-processing involved face detection & neck region feature to create dataset using **OpenCV**
- Achieved the accuracy of 84% for all the classes using **AlexNet** architecture as a base framework

Microsoft Code-fundo++ **Development of ML Algorithm for Flood Prediction on Azure Cloud Service**

- Dataset gleaned from Indian meteorology websites comprised of historical rainfall & altitude
- Designed and deployed ML workflow (flood prediction) on Azure Cloud Services

Parallel Programming **GPU accelerated implementation of Machine Learning algorithms using CUDA**

- Implemented parallelization of k-fold cross validation for regression and classification in CUDA **C++**
- Defined **CUDA** kernels for Linear Regression and Logistic Regression using Gradient Descent algorithm
- Achieved speed up of **3.5X** for regression and **2.5X** for classification as compared with serial code

Web Development **Personal Blog Web App in Django.**

- The application help to create/edit/delete blog using QuerySets and display on the website
- Implemented user-authentication features (login, logout, register) from scratch

Web & Coding club, IIT Bombay

MeshNet: Mesh Neural Network for 3D Shape Representation

- Implemented a research paper for 3D shape classification which takes data in mesh format and improved its accuracy to **89.6%**

Technical Projects

Innovation Cell, IIT Bombay

Mahindra Rise Driverless Car Challenge

- Part of a team of 20 members aiming to build Self Driving Car; India's 1st driverless car
- One of the 11 finalists out of 259 teams (IV Level) and received a **Mahindra E2O Car** for further development
- Headed the mechatronics subsystem to design mechanisms to mount **3D LIDAR**, Camera on the car

Computer Graphics

Voxelization of 3D model and Cutting Forces Prediction

- To develop voxelization algorithm of 3D CAD model for visualization using **OpenGL**
- Predicted the cutting forces and material removal rate during machining using voxelized CAD model

Positions of Responsibility

July'18-May'20

Teaching Assistant, IIT Bombay

- served 3 times as a TA for Computer Graphics and Product Modelling and Computer Numerical Control and Programming course at IIT Bombay
- Assisted Bachelor and Master students to clear their difficulties, also helping the professor in evaluation

Jan'19-May'20

Mentor ITSP, IIT Bombay

- Guided **20 students** on the topics OCR, handwritten character recognition using Deep Learning
- Provided the basic training of Python and Machine Learning to students

May'19-Apr'20

Campus Ambassador, InterviewBit

- Organized coding competitions to help students for campus placement preparation

Technical Skills

Programming: C, C++, Python

Tools: PyTorch, TensorFlow, MATLAB, Scikit-learn, Django, OpenCV, Git, LaTeX

Web Development: FrontEnd- HTML, CSS

Major Courses

Core Courses: Data Structures & Algorithms, Foundations of Machine Learning, Engineering Data Mining and Applications, High Performance Scientific Computing, Computer Graphics & Product Modelling, Robotics

Achievements & Extracurricular Activities

2016 Secured **Department Rank 1** among 210 students of UG 2016 batch

2018 Scored **99.31** percentile in GATE 2018 among 194,496 candidates

2019 Secured **Gold level** position in the **WorldQuant Challenge** organised by WorldQuant VRC

2013 Secured **Department Rank 3** in Diploma of 2012 batch

2018 Represented IIT Bombay in **Microsoft Codefundo++**

2019 Attended 3 days **GPU** bootcamp using CUDA conducted by NVIDIA

2019 Completed **Databases with python** course on Coursera

2018 Volunteered for **Python Workshop** conducted by PG Academic Council

2015 Participated in AVISHKAR Zonal level Research Project Competition organized by Pune University