Shrey Bansal

COMPUTER SCIENCE - IIT DELHI

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EDUCATION BACKGROUND

Indian Institute of Technology , Delhi — **New Delhi, India**
Bachelor in Technology, Department of Computer Science & Engineering — *July 2018 - Present*
Current CGPA - 9.474/10.0

Lancers Army School — **Surat, India**
CBSE All India Senior School Certificate Examination 2018 — *April 2002 - April 2018*
Percentage: 94.4/100
Indian Certificate for Secondary School Examination 2016
CGPA - 10.0/10.0

SCHOLASTIC ACHIEVEMENTS

- Awarded **IIT Delhi Merit Prize** consecutively for 2 semesters in 2018-19 for being in top **7** percentile.
- Secured All India Rank **175** in Joint Entrance Exam **Mains** - 2018 among 1.26 million candidates.
- Secured All India Rank **72** in Joint Entrance Exam **Advanced** - 2018 among 231,024 candidates.
- **NSE** (National Standard Examination) 2017- In top 10 position in the Merit List for Physics and Chemistry.
- Appeared in **INPhO** and **INChO** (2018).

PUBLICATIONS

Transfer learning based ensemble support vector machine model for automated COVID-19 detection using lung computerized tomography scan data

May 2020

- Designed a robust binary classification machine learning model to screen COVID-19 CT scans.
- Used Transfer Learning, Principal Component Analysis and Ensemble to train the machine learning model.
- Compared and tested various Computer Vision techniques popular for medical images screening.
- Developed a monitoring website for users where the uploaded CT scans are tested against the model.

Internships

Anasakta Labs (OPC) Pvt Ltd — **Machine Learning Intern**
May 2020 - June 2020

- Explored Graph Neural Networks for Digital Circuit Analysis and Synthesis
- Studied various Graph Neural Networks (GNNs) including Graph Attention Networks, Hypergraph Convolutional Attention Networks, Graph Convolutional Networks, Position-aware Graph Neural Networks.
- Designed solution for EDA Automated Cell Placement problem using Pytorch Geometric library.
- Trained the machine learning model using custom loss function designed to balance the wirelength and congestion simultaneously.

PROJECTS

Real Time Vehicle Detection and License Plate Recognition — **Prof. Anshul Kumar**
August 2019-Present

- Working on a system to automatically track and recognize vehicles through number plate recognition.
- Aiming for a real time system working at 25 fps capture to monitor traffic violations and vehicle tracking.
- Implementing the design using CNN and connected component analysis , the final deployment will be in Python.
- Developing a Monitoring app for data collection and analysis.

Surface Roughness Prediction in Micro Milling considering the Workpiece Properties **Prof. Sunil Jha**
October 2019-Present

- Working on a Machine Learning model to predict the surface finish considering the material properties of workpiece, material removal mechanisms and SFD (Spindle Speed, Feed Rate and Depth of Cut).
- Aiming to predict surface roughness of one material based on the data set obtained from some other material.
- Implementing the current design using Reinforcement Learning and Support Vector Regression, the final deployment will be in Python.

VGA Graphics Display with FPGA Basys-3 Board **Prof. Anshul Kumar**
October 2019 - November 2019

- Designed a VGA Display Controller in VHDL for the timing circuit for VGA Display.
- Designed a BRAM memory reader in VHDL to display any image(in coe format) of any size (within 640 X 480) with zoom-in and zoom out feature controlled by a switch.
- Designed a Ping Pong game and Screen Saver on VGA display in VHDL with controllers on FPGA board.

Bert Based QA model **Independent**
January 2020

- Designed a QA model Bert model trained on SqUAD Dataset. The model is based on Bidirectional RNNs.
- Fine tuned the model parameters with the given corpus. Also, tried to build knowledge graphs from unstructured text.

Job Scheduler for Project Management using RBTree, Trie, Priority Queue in Java **Prof. Subodh Kumar**
October 2019

- Designed a complete Project Manager for projects including flush for a company with basic query system.
- Jobs were stored in a MaxHeap Priority Queue and got completed according to their priority and runtime.

Database Management and Query System using Hash Tables in Java **Prof. Subodh Kumar**
September 2019

- Designed a database using hash tables(Double Hashing and Separate Chaining with BST) in Java to store student records for a college with a basic query system.
- Designed a completely generic system to store data based on user requirements with minimal changes.

Symbolic Differentiator in Python **Prof. Subhasish Banerjee**
April 2019

- Designed a symbolic differentiator in python using stacks which included all binary operations.
- Designed a parser and a calculator to differentiate any expression w.r.t given variable.

RELEVANT COURSES

- **Ongoing** : Computer Architecture, Programming Languages, Design Practices, Signal and Systems, Macro Economics
- **Finished** : Data Structures and Algorithms, Probability and Stochastic Processes, Discrete Mathematical Structures, Digital Logic and System Design, Linear Algebra and Differential Equation, Introduction to Calculus, Introduction to Programming
- **Self** : Machine Learning, Deep Learning, Computer Vision, Natural Language Processing, Data Analysis in Python, Android App Development, Web Development

TECHNICAL SKILLS

- **Languages** : C++, C, Java, Python, VHDL, SML, OCaml, HTML, JavaScript, CSS
- **Softwares** : MATLAB, Xilinx ISE and Vivado, AutoDesk, Latex, Git, Android Studio
- **Libraries** : NumPy, Pandas, Scikit, TensorFlow, MatPlotLib, OpenCV, Pytorch, Pytorch Geometric, Keras

EXTRA-CIRRUCULAR

Winner of TVS Credit E.P.I.C. IT Challenge **TVS Credit Services Limited, Chennai**
Februrary 2020

- Won a cash prize of Rs 1,00,000 (USD 1500).
- First among among thousands of teams.
- Represented IIT DELHI in this national competition.

Executive at ACES-ACM **IIT Delhi,Delhi**
EXECUTIVE *October 2018 - Present*

- Executive in the society for Computer Science Engineering.
- Major role to organize events and workshops for the organization.

Summer Intern at ISafe Assist **Saket,Delhi**
Jun 2019 - Jul 2019

- ISafe is 24*7 roadside assistance service, in collaboration with the Indian Road Safety Commission.
- Worked as a summer intern to spread awareness about roadside assistance and publicize ISafe.
- Created content like articles and helped in their system testing and improvement.

Designed Webapp for Nilgiri Hostel **IIT Delhi,Delhi**
September 2019 - Present

- Designed it for adding complaints and notify the concerned authorities.
- Developed in Android Studio , React Native.