Devansh Chandak | **180110027**
Computer Science & Engineering | **B.Tech.**
Indian Institute of Technology, Bombay | **Gender: Male**
DOB: 20-11-1999

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2022	9.66
Intermediate	CBSE	Birla High School, Kolkata	2018	99.00%
Matriculation	ICSE	La Martiniere For Boys, Kolkata	2016	98.67%

Scholastic Achievements

- Secured **All India Rank 4**, State Rank 2 in the Grade 10 **ICSE** Examination out of **170,000** students *(2016)*
- Achieved **All India Rank 5** in the **CBSE** Board Examinations (Grade 12) out of **1.2 million** candidates (**Overall** *East Zone Topper* and *All India Rank 3* in the Science Stream) *(2018)*
- Only student to receive the **Advanced Performance**(AP) grade in **Computer Programming** & **Utilization** and amongst the **top 3** in the **Biology** course*(Molecular, Physical and Biomedical modules) out of **500+** students (2018-19)*
- Awarded **AP grade** in **Advanced Calculus** (*top* **12** *out of* **1000+** students) for *exemplary* performance *(2018)*
- Attained a Semester Performance Index (**SPI**) of **perfect 10** in the First, Fourth, Fifth and Sixth (CS) Semesters *(2018-21)*
- Secured **Department Rank 9** *out of* **130+** students in Computer Science and Engineering *(2018-21)*
- Among the **top 12** students to be granted **Change of Branch**/Major to Computer Science *(2019)*
- Offered **Computer Science** at the National University of Singapore (**NUS**) with **100 %** scholarship *(2018)*
- Bagged the **Institute Academic Award**, given to the **Top 25** out of a batch of 1000+ students for *exceptional* academic performance in the first year of Undergraduate Study at IIT Bombay *(2018-19)*
- Bestowed with the **KVPY** (Kishore Vaigyanik Protsahan Yojna) Fellowship, given to the talented young minds in the field of Science and Technology, by Department of Science and Technology, Govt. of India *(2018)*
- Felicitated by **The Governor of West Bengal**, with the *Mamraj Agarwal Rashtriya Puraskar* for exemplary performance in the ICSE and by *Mr. S.K.Birla*, industrialist & trustee of Birla High School with a **Gold** medal *(2016, 2018)*
- Received a **Letter of Appreciation** from Ms. Mamata Banerjee, Chief Minister of West Bengal for *exemplary* performance in the CBSE Examinations along with the *Swami Vivekananda Scholarship* for *Undergraduate Study* *(2018)*

Internship and Research Experience

Software Engineering Intern *(May '21 - Jul '21)*
One Fleet Autopilot Team, Azure Compute Group, Cloud + Artificial Intelligence Microsoft IDC, Hyderabad
- As part of an exercise to consume datacenter inventory in a unified format, updated a critical tool used by Autopilot teams, tenants and services to enumerate fault domains for servers in different datacenters to support both inventory formats in use today while migration from one to the other. In addition, added access from both developer and production machines.
- Used **C#, C++/CLI** and **C++** and Cockpit (for querying)
- Awarded a **full time offer** for exceptional performance shown throughout the internship

Software Development Intern Motilal Oswal Financial Servies Ltd. | *(Dec '20 - Jan '21)*
- Designed an HR **Compliance portal** with different functions for different user types, using C#, Asp.Net and Ms-Sql
- Features: add/edit user and document category details, upload documents in each category and view them in a repository

Computational Linguistics (COLING) Conference, 2020 NLP Conference | *(July - Dec '20)*
- **Textgraphs-14**: Shared Task on **Multi-Hop Inference** for **Explanation Regeneration**:
  - Co-authored a **publication**, developed methods to reconstruct the explanation graph for elementary science questions
  - Developed a model with an improvised Information Retrieval using tf-idf vectorizer to rank all explanations in the dataset
  - Designed a unique *re-ranker* using **BERT**, *RoBERTa* & *SciBERT*, got 0.5061 Map score and were ranked **4th**

Research Intern — Cryptography INRIA, Nancy, France | *(April - May '20)*
- Formal **Verification** of *security protocols*:
  - Studied operational semantics, equivalence properties (in the *applied pi calculus* and the **Tamarin** prover) and the **SAPIC** plugin (tool translating high level protocols to multiset rewrite rules, *analyzable* by Tamarin)
  - Introduced the notion of biprocesses (*semantics and translation*) and **diff equivalence** in SAPIC, and worked on the **soundness proof** of the translation after the addition

Quantitative Research Analyst *(Dec '19 - Jan '20)*
Guide(s): Prof. Prasanna Tantri, Prof. Nitin Kumar and Ravi Ranjan Indian School of Business, Hyderabad
- **Deep Learning:** *Applying **NLP** techniques to **Time Series Analysis** for Stock Futures :*
  - Designed an intuitive approach for storing the stock history in vector form using a Ticker **Embedding Model**. Incorporated technical indicators such as Momentum, Trailing Volatility, Asset Class and average return per asset class
  - Designed and implemented an **LSTM** classifier (using **PyTorch**) to forecast the trend of **Expected Returns**
  - Expanded the LSTM to incorporate **attention**, and **retrain** over latest data *while testing*
  - Optimized the hyperparameters using libraries: Ray for **Grid Search** and Hyperopt for **Bayesian** optimization
- **Trading Algorithms:** *Implementation* and *back-testing* using **Python**
  - Implemented the **Pairs**, **Betting against β** and **Momentum** trading algorithms on the Nifty-200 stocks
  - Experimented with daily, weekly and monthly *rebalancing* of equally weighted and value weighted portfolios
- Awarded a **Letter of Recommendation** for *exceptional* performance shown throughout the internship

Data Analytics Intern SPENCER'S RETAIL LTD.- RPSG GROUP | *(June - July '19)*
- *Analysis of underperforming stores given all KPIs and SKU (Stock Keeping Units) level data*: **Statistical Analysis** of transactional & brick level data to attribute reasons for de-growth in the *MGF Gurgaon* and *Vizag* hyper stores
- Given all category **KPIs**, *deep dived* into SKU level performance to come up with solutions to **counter degrowth**

Machine Learning Intern INDIAN INSTITUTE OF TECHNOLOGY, KANPUR | *(May - June '19)*
- *Analysis of ML Algorithms for Spam Email Classification in Python*: Anaylzed SVMs and Neural Networks before implementing **Naive Bayes** and **KNN** on numerous data sets using *Keras*, Pandas, Numpy and *Scikit-learn*

Software Engineering Intern CITYTECH SOFTWARE PVT. LTD. | *(Nov - Dec '18)*
- Configured and enhanced a **chatbot** for Employee Leave Applications using **Microsoft LUIS** after a *comparative study* with *Google Dialog Flow*. Helped in introducing *Voice to Text feature* (using Bing API) from Microsoft Azure
- Researched on **Human Resource Automation** and developments in *Google Assistant, IBM Watson, Alexa and Cortana*

KEY TECHNICAL PROJECTS

Patent-Stock Market Project | *Machine Learning* | *Guide: Prof. Suyash Awate* B.TECH PROJECT | *(Ongoing)*
- Studying the impact of granted patents on the prices in the Indian stock market (developing market) using NLP techniques
- Parsing pdfs to extract details of each patent, after whuch linking of patent & stock database and model fitting will follow

Restaurant Management System | *Database and Information Systems* COURSE PROJECT | *(Mar - May '21)*
- Created a GUI website application for a Restaurant Management System with cookie based login authentication
- The application creates an ordering pipeline (order, cook, serve) that simulates a real-world restaurant system
- Customer can view recommendations, filter dishes based on cuisine, place orders, chef/waiter can complete the orders. Owner can update inventory, employee information, allot orders and view analytics & graphs on top dishes, employees, time-filterable statistics on profits, expenditure & wastage. Used **MVC** architecture in **NodeJS**, **PostgreSQL**, Bootstrap

Sclp Compiler | *Compilers* COURSE PROJECT | *(Jan - Apr '21)*
- Created a C-like compiler from scratch using lex and yacc
- Implemented the scanning, parsing, Abstract Syntax Tree (AST), Three Address Code (TAC) and Register Transfer Language (RTL) stages for input programs with visibility of output of each intermediate stage
- Supports assignments, functions, complex expressions, control flow structures with all data types and operations
- Ensured illegal tokens, syntax errors, semantic errors are reported

Buffer Overflow Attacks and Defenses | *Computer Architecture* COURSE PROJECT | *(Sept - Dec '20)*
- Demonstrated the Stack and Heap based buffer overflow exploits and the special cases: Return to LibC, Off by One and Use after Free using **C** & **x86**. Performed a detailed case study on the Code Red Worm which was based on buffer overflow

Google Forms and Survey Management | *Software Systems* COURSE PROJECT | *(Sept - Nov '19)*
- Designed own Form and Survey Management system like Google Forms with **user authentication**
- Allowed *modular* question design (paragraph, file upload, dropdown, checkbox, radio button), form validation (constraints on answers like alphanumeric, range, email-ID, .pdf only), adding **collaborators** and shareable forms (surveys & quizzes)
- Data analyzable by plotting of numerics (**Matplotlib**), learning dependencies in responses and summarized presentation of subjective answers. Used **Django** for backend, **Sqlite3** for database structure, **Bootstrap** for responsiveness

Sentiment Analysis by BERT SELF PROJECT | *(July '20)*
- Achieved **91 %** accuracy in predicting positive/negative sentiments on the **IMDB** reviews dataset
- Used BERT from the Hugging Face *transformers* library and **Pytorch** for preprocessing and funetuning the model

Other Course Projects
- **File System**: Emulated a disk over a text file with the superblock, inode and data blocks. Implemented a file system on the emulated disk with basic operations like open/close/read and write
- **Custom Linux Shell**: Built a shell in **C** with support for background, serial & parallel processes, and kill signal & exit
- **Pure Numpy Implementation of CNN**: Implemented the Fully Connected, Convulution, Avg and Max Pooling layers in pure numpy. Trained the model on the MNIST and CIFAR10 datasets to achieve accuracies of 94% & 53% respectively
- **Spanning Tree Protocol**: Simulated the network bridge topology as a *distributed system* of nodes, communicating via messages, in **C++**. Configured nodes to run the protocol and agree upon a *loop-less topology* to prevent a *broadcast storm*
- **SAT Solver**: Designed a SAT Solver using **z3 in Python**, to check satisfiability in CNF (Conjunctive Normal Form). Solved the *NQueens, Sudoku* and *Graph Colouring* problems with the solver, using **DPLL** (a backtracking algorithm)

TECHNICAL SKILLS

Languages	C++, PYTHON, JAVA, C#, C++/CLI, BASH, MATLAB, VHDL
ML Libraries	PYTORCH, KERAS, TENSORFLOW, SCIKIT-LEARN, RAY, HYPEROPT, ROUGE, GROBID
Web Tools	HTML5, CSS3, JAVASCRIPT, BOOTSTRAP, DJANGO, SQLITE3, MS-SQL, ASP.NET, NODE.JS
Software Tools	GIT, LaTeX, SED, AWK, MAKEFILES, SCIPY, NS3, WIRESHARK, PROVERIF, NEO4J, SPARK

POSITIONS OF RESPONSIBILITY

Teaching Assistant | *CS 347 + CS 333 - Operating Systems & Utilization* | *Prof. Mythili Vutukuru* *(Ongoing)*
- One of the 3 undergraduate TAs selected. Involved in making exams, grading labs and exams and assisting students

Department Academic Mentor | *Computer Science & Engineering Department* *(Ongoing)*
- Selected after extensive peer reviews and interviews for guiding students in their academics and curriculum

Teaching Assistant | *CS 101 - Computer Programming & Utilization* | *Prof. Purushottam Kulkarni* *(July - Nov '19)*
- **Only sophomore** to be selected for TA-Ship on the basis of **academic prowess** in the subject. Involved in teaching and assisting students within and outside lab hours, with problems and conceptual doubts on a **one-to-one basis**

Interact Coordinator — Community Service | *Rotary Club of Calcutta Visionaries* *(2017-18)*
- Coordinated **blood camps, health camps**, eye camps, newspaper collection drives, **organised sports** for *village children* in the Sunderbans. Conducted free **computer classes** for *underpriveleged* children of Sambhu Sadan Vidyala, Kolkata