



Nilesh Gopaji Sonune
Electrical Engineering
Indian Institute of Technology, Bombay
Specialization: Communication & Signal Processing

16D070004
Dual Degree (B.Tech. + M.Tech.)
Gender: Male
DOB: 12-03-1999

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	8.55

PROFESSIONAL & RESEARCH EXPERIENCE

TransUnion CIBIL, Mumbai | Data Science Intern | Data Innovation and Research Team [May'19 - July'19]

- Processed **850+ million** records using **Hive** and **Spark** to map commercial entities with their individual associates
- Identified **47.8% overlap** between individual loans and commercial entities using a **data filtration** strategy
- Analyzed trends in NPA rate, Balance Share across **20 loan types** for **correlation analysis** of the MSME sector
- Investigated **3 years** of Repayment behaviour of borrowers for **accurate risk assessment** of the market
- Developed a **Dynamic Dashboard** in **Tableau** to show quarterly trends on market insights for **Commercial Bureau**

Joint Audio-Visual Speech Recognition | Master's Thesis | Guide: Prof. Rajbabu V. [Jan'20 - Present]

- Deployed a novel audio-visual dataset generation pipeline to process **7.5 hr** of video content in **1 hr** to generate **1100+** samples
- Automated the AV dataset creation process using **Face Detection** and **Facial Landmark Detection** algorithms in **dlib**
- Identified accent related flaws in **Transformer** based **TM-CTC** model and **improved** its **WER by 30%** after fine-tuning
- Future work involves using **Active Speaker Detection** to build an end-to-end model for multi-speaker speech recognition

KEY COURSE PROJECTS

Land Cover Classification on EuroSAT | Advanced Satellite Image Processing [Jan'20 - Apr'20]

- Implemented **Decision Tree**, **Random Forest Classifier** from scratch in **Python** and achieved **62.74% accuracy** on EuroSAT
- Improved test accuracy to **97.72%** by fine-tuning the dataset on different CNN models from **ResNet**, **VGG** series in **Keras**

Image Compression with LZW Encoding | Image Processing [July'19 - Nov'19]

- Achieved **2x faster** near lossless image compression with **>51dB PSNR** across different benchmark images
- Realized image compression by **Clustering Correlated Pixels** followed by LZW encoding from a research paper
- Implemented **RLE**, **Huffman** and **LZW** compression schemes in **MATLAB** to prove algorithm's spatial & temporal efficiency

System Modelling and Simulation | System Modelling [Jan'19 - Apr'19]

- Achieved **0.76** test MSE on a FeedForward Neural Network model in **Keras** for DC motor **Steady-State Modelling**
- Obtained **1.03** test MSE for a multi-input multi-output (**MIMO**) **time series LSTM model** with hybrid two tank system

Automatic Speech Recognition System | Speech Processing [July'19 - Nov'19]

- Built a **Word Recognition** system using vector quantized **Codebook Matching**, MFCC feature extraction & end-pointing
- Achieved **75.89%** accuracy on clean set and **47.65%** accuracy on noisy set of Google Speech Commands dataset

DPLL based SAT Solver | Foundation of VLSI CAD [July'18 - Nov'18]

- Implemented DPLL, a **Backtracking based search** algorithm to solve **Boolean Satisfiability** problem in **Python**
- Applied Unit Clause Propagation & Pure Literal Elimination before recursive literal assignment to **speed up program**

POSITIONS OF RESPONSIBILITY

Graduate Teaching Assistant | Speech Processing [Aug'20 - Present]

- Responsible for managing **online logistics**, assisted in evaluation of assignments, tests of **50+** students for smooth regulation

Services Coordinator | Mood Indigo 2017 [Jun'17 - Dec'17]

- Spearheaded a team of **20+ organizers** for managing VIP events, Negotiated product deals to **optimize overall budget**

Interview Coordinator | Institute Placement Team, IIT Bombay [Nov'17 - Dec'17]

- Coordinated with a team of **250+ members** for interviews of **1600+ students**, Assisted in conducting Talks & Tests for **15+ firms**

TECHNICAL SKILLS

Data Analysis & ML/DL	PyTorch, Tensorflow, Keras, OpenCV, Numpy, Pandas, Matplotlib, Scikit-Learn, Tableau
Programming Languages	C++, C, Python, MATLAB/Scilab, SQL, VHDL, \LaTeX
Relevant Coursework	Machine Learning, Advanced Machine Learning*, Deep Learning, Image & Speech Processing, System Modelling & Simulation, Data Analysis & Interpretation, Estimation & Identification

*To be completed by Dec'20

EXTRACURRICULAR ACTIVITIES

Scholastic	<ul style="list-style-type: none"> Secured 92.69 percentile in JEE-Advanced & 98.96 percentile in JEE-Mains among all candidates in India ['16] Honored with Letter Of Appreciation from Minister for School Education for excellence in SSC ['14]
Technical	<ul style="list-style-type: none"> Completed Competitive Programming under Season Of Code; Solved DSA Problems [Apr'20 - Jun'20] Attended Analytics and Machine Learning bootcamp organized by Career Cell, IIT Bombay [Jun'18]
Culturals	<ul style="list-style-type: none"> Secured 2nd position in the Ad-Making Competition held under Freshiezza 2016 [Aug'16] Received Special Mention in Spoof-a-Scene Competition held under Freshiezza 2016 [Aug'16]

Scholastic achievements and extracurricular activities are not verified by the Placement Cell