NIMITT

Final-year Undergraduate, Computer Science
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EDUCATION

Indian Institue of Technology, Gandhinagar *2022 - 2026*
Bachelor of Technology, Computer Science and Engineering
Grade: **9.13** / 10

KC Public School, Una *2021-2022*
Higher Secondary (+2)
Grade: **95.6** / 100

KC Public School, Una *2019-2020*
Secondary
Grade: **93.3** / 100

SKILL SUMMARY

Programming Languages	Python, C, C++, MATLAB, Verilog
Python Packages	Pandas, Matplotlib, Numpy, Scipy, Pandas, ScikitLearn, Pytorch Tensorflow, Qiskit, Pennylane, Socket
Software & Tools	HTML, LaTeX, Arduino IDE, Xilinx Vivado, Synopsys Sentaurus, Blender 3D, Fusion 360, Inventor

RELEVANT COURSES

Probability, Statistics & Data Visualisation [**A**]
Data-Centric Computing [**A**]
Data Structures and Algorithms [**A**]
Data Structures and Algorithms II [**A-**]
Computational Complexity Theory [**A**]
Algebraic Complexity Theory [**A**]
Measure Theory And Probability [**P**]
Computer Vision [**A**]
Machine Learning [**A-**]
Foundations of AI: Multi Agent Systems [**A-**]
Natural Language Processing [**A-**]
Signals Systems and Random Processes [**A**]
Digital Systems [**A**]
Ordinary Differential Equations [**A+**]
Linear Algebra and Calculus of One Variable [**A**]

[**A**]: 10/10, [**A-**]: 9/10, [**A+**]: 11/10 (Awarded in rare, exceptional cases)

RESEARCH PROJECTS

Notation: [*] - Ongoing

Probability Amplification and Distributed Gaussian Mean Testing *Summer 2025*
Research fellow, Prof. Clément Canonne, The University of Sydney

- Conducted literature review on Probability Amplification Techniques and compared their affectiveness.
- Built a library, ralgos, with sampling and inference tools for random distributions.
- Derived Sample Complexity bound, given that users share finite randomness, for Distributed Gaussian Mean Testing Problem under Communication Constraints.

Distributed Gaussian Sphericity Testing Under Communication Constraints * *Fall 2025*
Research Fellow, Prof. Anirban Dasgupta, IIT Gandhinagar

- Formalized the problem of Gaussian Sphericity Testing (GST) under Communication Constraints
- Derived the Sample Complexity for Distributed GST Problem under communication constraints.
- Explained role of shared randomness in the distributed setting, yielding insights into the problem.

Quantum Computing for Machine Learning and AI *Spring 2025*
Research Fellow, Prof. Anirban Dasgupta, IIT Gandhinagar

- Conducted Literature Review on Quantum Computing Techniques (QML) for Machine Learning.
- Showed Expressivity of QML Models like Variational Quantum Circuits, Quantum PCA using phase estimation, and Quantum SVMs on standard machine learning tasks.
- Developed SQORE: Simple Quantum OpeRations Engine, a high level quantum simulator.

Prediction of intermediate profiles during etching *May 2024 - July 2024*
Research Fellow, SRIP 2024, Prof. Nihar Ranjan Mohapatra, IIT Gandhinagar, Project Link

- Used Synopsys Topography tool to generate dataset using simulation programs for Selective HCl etching of Ge against Si used in GAAFET manufacturing.
- Trained LSTM models on the dataset which demonstrated the ability to precisely predict the output of process with relative errors less than 5%, given the parameters of the process

INDUSTRIAL PROJECTS

Machine Learning

Posense: Human Activity Recognition *Spring 2024*
Fellow, Prof. Nipun Batra, IIT Gandhinagar, Project Link

- Analyzed the UCI-HAR dataset with time-series data of thirty subjects performing six activities.
- Harnessed the TSFEL library for feature extraction and PCA for dimensionality reduction.
- Trained a Decision Tree model on the featurized data and tested it using the activity data collected with the Physics Toolbox Suite app to achieve 70% precision and 67% accuracy.

Data Narrative on various Datasets *Spring 2023*
Fellow, Prof. Shanmuganathan Raman, IIT Gandhinagar, Project Link

- Analyzed diverse datasets like (a) Goodread Book rating dataset, (b) Tennis Tournaments in 2013 and (c) USNews and AAUP dataset on United States Colleges using Probability, Statistics and ML
- Created interactive plots and visualizations giving important insights into the dataset

Computer Vision

CVToolkit: Computer Vision Toolkit *Fall 2023*
Fellow, Prof. Shanmuganathan Raman

- Developed Computer Vision tools like denoising filters: Gaussian, Median and Box filter, Image Blending using Laplacian pyramids, Panorama Stiching, Lucas-Kanade Algorithm, SIFT Feature mapping, Camera Estimation and Stereo Rectification.

Software Development

ddNLP: Domain Decomposition for Nonlinear PB Equation Toolkit * *Fall 2025*
Fellow, Prof. Abhinav Jha, IIT Gandhinagar, Project Link

- Implement ddNLP in Python, providing with tools to solve Nonlinear Poisson-Boltzmann Equation using domain decomposition under SES boundary condition.

QALGO: Quantum Programming Language *Spring 2025*
Fellow, Prof. Balagopal Komarath, IIT Gandhinagar, Project Link

- Built a high-level quantum programming language that provides abstraction for general programming constructs and quantum operations.
- Designed Sqore with (q)MIPS bytecode making it an efficient alternative to other quantum simulators.

NextMove: Logical Puzzle and Graph based Games developed using C *Fall 2023*
Fellow, Prof. Balagopal Komarath, IIT Gandhinagar, Project Link

- Developed solvers for games like Connect4, Up-it-Up, Sudoku Solver, and 2x2x2 Rubik's Cube Solver using optimal move strategy between two player moves and graph traversal algorithms.

Safaride: Child Safety Monitoring App for Cycling *Fall 2023*
Fellow, Prof. Nitin V George, IIT Gandhinagar, Project Link

- Designed an Android application for a smart bicycle with embedded sensors from a device to ensure child safety with features like Speed, Location and Fall Alert
- Integrated MATLAB's Simulink Support Package for Android Devices and configured UDP models for efficient data transmission between the child's and parent's devices.

Natural Language Processing

Bengali Embeddings *Fall 2024*

- Curated dataset on Bengali language followed by cleaning and preprocessing of the dataset.
- Generated vector embeddings for the dataset using classical and deep learning NLP methods.

MLPigen: Text Generator based on MLP *Feb - March 2024*
Fellow, Prof. Nipun Batra, IIT Gandhinagar, Project Link

- Engineered Multilayer Perceptron models for next character prediction given the fixed number of characters as context, trained on Shakespear's writings dataset
- Deployed a Streamlit application to enable users to graphically select various hyperparameters for the trained models emphasizing effect of these hyperparameters on model performance

Systems

Snifox: Network Packet Sniffer *February 2025*
Fellow, Prof. Sameer Kulkarni, Project Link

- Developed a network packets sniffing tool to debug network load and real-time analyze network traffic.

NanoChat: Next Word Predictor on an FPGA *Spring 2024*
Fellow, Prof. Joycee Mekie, IIT Gandhinagar, Project Link

- Trained a character level LSTM model on curated dataset of IIT Gandhinagar Advisories
- Used Digital Systems concepts to implement trained model on Nexys FPGA Board having limited computational resources

ACHIEVEMENTS

Daya Shanker and Shakuntala Scholar, IIT Gandhinagar	*2025*
Dean's list Semester 1, 2, 3 and 4, IIT Gandhinagar	*2022-24*
Academic Citation Semester 6, IIT Gandhinagar	*2025*
JEE Mains and Advanced, 2022 Qualifier	*2022*
National Talent Search Examination, 2020 scholar	*2021*
NDA Examination, 2022 Qualifier	*2022*

POSITION OF RESPONSIBILITIES AND EXTRACURRICULAR

HackRush, 2024 *Jan - April 2024*
Member

· Contributed in organising HackRush 2024, IIT Gandhinagar's flagship Hackathon where > **300** students participated.

Systems Programming Club, IIT Gandhinagar *2023 - 2024*
Member

· Contributed in organising CTF Hackathons and workshops conducted by the club

Squash Club, IIT Gandhinagar *May 2024 - Present*
Secretary

· Managed all the squash club activities, building the squash and sports culture in the community.
· Lead Squash Team, IIT Gandhinagar in Inter-IIT Sports Meet, 2024 to Quarterfinals.

Sports Achievements

· Professional Squash Player, holding All India Rank < **500** in India National Open Rankings.
· State Level Chess Player, Himachal Pradesh, India