Anirudh Mittal

Junior Undergraduate
Electrical Engineering
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ACADEMIC DETAILS

Degree	Specialization	Institute	Year	CPI/%
B.Tech.	*Electrical Engineering*	IIT Gandhinagar	2023-Present	8.69
Class XII	*Physics, Chemistry, Maths*	Sanskar Public School	2022-2023	9.60
Class X		Gwalior Glory High School	2020-2021	9.50

RESEARCH EXPERIENCE

- **Simulation of GaN-based FerroHEMT for High Power Frequency Applications** [January '25 - Present]
  (Advisor - Prof. Jhuma Saha, IIT Gandhinagar)
  - Conducting TCAD simulations on GaN-based Ferroelectric High Electron Mobility Transistor (FerroHEMT) heterostructures, focusing on optimizing performance for high-power and high-frequency applications.
  - Designing heterostructures using the properties of GaN, including high electron mobility, superior power efficiency, and robust thermal stability.
  - Simulating and analyzing the impact of ferroelectric materials like AlScN and AlYN to enhance polarization effects, achieving a higher sheet carrier density in GaN two-dimensional electron gas channels.

COURSE PROJECTS

- **Digital Signal Processing Simulator** [January '24 - April '24]
  (Prof. Arup Lal Chakraborty, IIT Gandhinagar) | *Project Link*
  - Designed and implemented a system for real-time audio signal processing, using DSP algorithms to demonstrate low-pass, high-pass, and band-pass filtering with precision.
  - Assembled and tested circuits that incorporate components such as Arduino, audio amplifiers (LM386 and LM358), condenser microphones, and passive filters for signal processing.
  - Developed programmable DSP algorithms on the Arduino platform to allow user-controlled filter selection and dynamic parameter adjustments through an interactive interface.
  - Conducted extensive testing to validate the system's ability to modify audio signals effectively, making DSP concepts more accessible for practical learning.
- **Digital Signal Processing Simulator** [August '23 - November '23]
  (Prof. Himanshu Shekhar, IIT Gandhinagar) | *Project Link*
  - Developed a driver drowsiness detection system leveraging pressure sensors (integrated with Arduino Uno) to monitor grip variations on the steering wheel and ESP32 camera modules for blink rate detection using computer vision algorithms.
  - Implemented and calibrated DSP algorithms to process real-time sensor data, allowing precise detection of fatigue indicators and generating immediate auditory alerts through a buzzer system.
  - Conducted performance validation under diverse driving conditions, showcasing system robustness and reliability in detecting subtle behavioral and physiological fatigue cues.
  - Proposed advanced upgrades, including adaptive machine learning models for real-time behavior analysis, vibration pads for tactile feedback, and high-resolution cameras for enhanced low-light performance.
- **Cook's Steam Engine - Autodesk Inventor** [August '23 - November '23]
  (Prof. Sameer Patel, IIT Gandhinagar)
  - Modeled a functional steam engine prototype in AutoDesk Inventor, demonstrating piston motion, beam oscillation, and rotational energy conversion.
  - Simulated mechanisms of crankshafts, eccentric sheaves, and centrifugal pumps for continuous power transmission.

TECHNICAL SKILLS

- **Programming Languages:** Python, C , C++ , Verilog , Arduino IDE .
- **Tools:** Sentaurus TCAD , MATLAB , Simulink , Xilinx Vivado , Autodesk Inventor.
- **Libraries:** Numpy , Pandas , Matplotlib.

RELEVANT COURSES

- **Ongoing Courses:** Digital Systems , Control Systems , Numerical Methods .
- **Completed Courses:** Electronic Devices, Data Structures and Algorithms , Signal Systems and Random Processes , Probability , Statistics and Data Visualization , Data Centric Computing , Principles and Applications of Electrical Engineering , Calculus of Single Variable and Linear Algebra , Computing .

ACADEMIC ACHIEVEMENTS

- Secured an All-India Rank of 3846 in JEE Advanced 2023 and 6563 in JEE Main 2023.
- Runner up at CBSE National Science Fair 2019 and Winner at the DRDE Science Exhibition 2018.

POSITION OF RESPONSIBILITY

- Content Coordinator and Curation Lead at TEDxIITGandhinagar 2025.
- Senior Conclave and Symposium Executive at Amalthea 2024.