GUNETHRA BOMMINENI

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EDUCATION

Indian Institute of Technology, Hyderabad (IITH) *Nov 2022 - May 2026 (expected)*
B.Tech. in IC Design & Technology (Electrical Engineering)
GPA: 7.5/10

PUBLICATIONS

[1] **Gunethra Bommineni**, N. P. K, R. Jangra, V. Sharma, and N. K. Emani, "Small-Signal Modeling of Double Heterostructure and Quantum Well Lasers using Verilog-A," in *Proceedings of the 2025 7th IEEE International Conference on Emerging Electronics (ICEE) - Upcoming*, Accepted for presentation, 2025.
[2] **Gunethra Bommineni**, N. P. K, R. Jangra, and N. K. Emani, "Large-Signal Modeling of Double Heterostructure and Quantum Well Lasers using Verilog-A," Submitted - Under review, 2026.

EXPERIENCE

LASER Device Modeling [1][2] Jan 2025 - Present
Supervisor: Prof. Naresh Kumar Emani IITH

· Developing Verilog-A models for semiconductor LASER devices, including double heterostructure, quantum-well, and VCSEL architectures under the guidance of Prof. Naresh Kumar Emani at the Nanophotonics Lab, IIT Hyderabad

Electrical characterization of Ti thin films Jul 2024 - Aug 2024
Mentors: Dr. Nicholas Morrissey and Dr. Angshuman Deka Purdue University

· Characterized temperature-dependent I-V characteristics and sheet resistance of E-beam evaporated titanium thin films on silicon wafers from 25°C to 200°C using four-probe measurement
· Expanded study to analyze Ti films deposited via different methods and rates across wafer regions to evaluate deposition procedure and temperature effects
· Collected and analyzed 1000+ data points using a parameter analyzer and a 4-point probe station equipped with a heated stage
· Presented experimental results and analytical conclusions to Prof. David Janes, Prof. Arnold Chen, and Prof. Rahim Rahimi

India-US Collaborative Semiconductor Workforce Development Program
Apr 2025 - May 2025 Purdue University & IITH

· Selected for India-US Collaborative Program STARS Lite (Summer Training on Awareness and Readiness for Semiconductors) at Purdue University, funded by the Ministry of Education, Government of India
· Completed training on lithography, deposition, etching, and MEMS characterization at Birck Nanotechnology Centre (Purdue University) and Nano-X Lab (IIT Hyderabad)
· Mentored 50+ students on photolithography techniques (DLW, DUV, etc.) as a Teaching Assistant at IIT Hyderabad's Class 100/1000 cleanroom
· Supervised by Prof. Siva Vanjari, Prof. Naresh Emani, and Prof. Shiv Govind Singh from IIT Hyderabad, and Prof. David Janes, Prof. Arnold Chen, and Prof. Rahim Rahimi from Purdue University

CeNSE Summer School, Indian Institute of Science 3rd-14th June 2024
Professors at CeNSE Online by IISc

- Selected through a competitive process for the online training program for undergraduate and master's students on various research topics under the broad umbrella of nanoscience and engineering by CeNSE, IISc Bangalore
- Awarded Certificate of Distinction for scoring above 75% in the final evaluation

Inter IIT Tech Meet 12.0, Indian Institute of Technology Madras Oct 2023- Dec 2023
Jaguar Land Rover's Chiplet Challenge

- Represented IIT Hyderabad at Jaguar Land Rover's Chiplet Challenge (High Prep problem statement) at Inter IIT Tech Meet 12.0, IIT Madras
- Analyzed chiplet architectures and UCIe interconnects, comparing 1.5D and 3D integration approaches
- Proposed system architecture and performed thermal analysis to evaluate chiplet feasibility for Jaguar Land Rover's automotive computing requirements

SKILLS/HOBBIES

Programming Languages	Python, C, Verilog-A, MATLAB, Wolfram Mathematica
Tools	Ansys (Q3D, SIwave, Lumerical), LTSpice, KiCad, LaTeX Cadence Virtuoso, TINA-TI, Xilinx Vivado, Arduino IDE
Hobbies	Cycling, Swimming, Robotics, 3D Printing

PROJECTS

Analysis of DDR4 Memory Module Apr 2025 - May 2025
Guide: Prof. Naresh Kumar Emani IITH

- Evaluated signal and power integrity performance of open-source SO-DIMM DDR4 PCB design (Micron 200-ball WFBGA) using Ansys SIwave and Q3D
- Extracted and studied key parameters such as S-parameters, crosstalk, time/frequency domain signal analysis, and eye diagrams

Quadruped Robot Jul 2024 - Aug 2024
Robotix Club IITH

- Led electronic and embedded system design for the quadruped robot dog project as the Electronics and Embedded Systems Head of the Robotix club.
- Project showcased at Pan IIT Tech R&D Expo hosted by IIT Bombay.

Wireless Portable ECG Jan 2024 - Jul 2024
Supervisors: Prof. Abhishek Kumar IITH

- Prototyped a portable wireless ECG device PCB with real-time data capture, cloud/PC integration, on-board Bluetooth/WiFi antenna, and Espressif SoC for data processing
- Optimized for portability and affordability while maintaining high performance; developed in KiCAD and open-sourced on GitHub.

Course Projects Jan 2024 - Jul 2024
EE Circuits Lab IITH

- Designed 6-transistor 1-bit SRAM cell with READ/WRITE functionality(CMOS inverter technology), 3-bit Flash Analog-to-Digital Converter (ADC) and R-2R ladder Digital-to-Analog Converter (DAC)
- Built digital clock and random number generator circuits using seven-segment LED displays, counters, shift registers, and breadboard

ACHIEVEMENTS

Samsung Student Fellowship for ISWDP-IISc Cohort 4 *2025*
Star Performer (Mentorship) and Mentor of the Month Awards, awarded by Sunshine-IITH *2024*
UG merit-cum-means scholarship, awarded by Reliance Foundation *2022*
All India Rank of 5464 in JEE Advanced 2022 among 150k candidates *2022*
All India Rank of 5272 in JEE Mains 2022 among 900k candidates *2022*

EXTRACURRICULAR ACTIVITIES

LEADERSHIP ROLES

- SPIE Student Chapter - IIT Hyderabad *Sep 2025 - Present*
- Robotix Club Head - The Robotics and Automation Club of IITH *Jun 2024 - May 2025*
- Teaching Assistant - Digital Fabrication (ID10054) *Jan 2024 - Apr 2024*
- Electronika Club Core - The Electronics and Signals Club of IITH *Aug 2023 - Apr 2024*
- Kludge Club Core - The Cybersecurity and Networking Club of IITH *Aug 2023 - Apr 2024*

COMMUNITY INVOLVEMENT

National Service Scheme (NSS) Volunteer, IIT Hyderabad *Nov 2022 - Present*

- Contributed more than 120 hours of community service (as of Aug 2025)
- Participated in campus cleanliness drives and Swachh Bharat Abhiyan (Clean India) initiatives
- Designed awareness posters on social issues and participated in walkathons promoting public health and social causes
- Engaged in outreach programs at orphanages and nursing homes

Sunshine UG Mentor - The Counseling Cell of IIT Hyderabad *Jan 2023 - Apr 2024*

- Supported freshers' transition to IIT Hyderabad through regular wellness meetings and collaborated with the Sunshine team on community events and programs
- Recognized as "Mentor of the Month" and the prestigious "Sunshine Star Performer" for going beyond duty to improve the mental well-being of the IITH community