Guntas Singh Saran

Junior Undergraduate
Computer Science and Engineering

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Education

- **Indian Institute of Technology Gandhinagar** **CGPA: 9.45**/10
  *Bachelor of Technology in **Computer Science and Engineering*** *October 2022 – May 2026*

Experience

- **Computer Vision, Imaging, and Graphics (CVIG) Lab, IIT Gandhinagar**
  (Summer Research Intern — Advisor - Prof. Shanmuganathan Raman) — Project Link *May 2024 - July 2024*
  - Researched Variational Autoencoders, Vector-Quantized VAEs, GANs, and Diffusion Probabilistic Methods.
  - Implemented Unconditional Latent Diffusion Model on CelebAHQ-Mask dataset and performed Image Inpainting tasks using the trained LDM and implemented Deep Convolutional GAN on MNIST and CelebA datasets.
  - Investigated GAN inversion for image compression and editing using StyleGAN architechture.

Selected Projects

- **Sparsifying Networks while Preserving Communities**
  (Advisor - Prof. Anirban Dasgupta, IIT Gandhinagar) — Project Link *April 2024*
  - Leveraged NetworkX and CDLib to extract community structures from sparsified graphs and compared them with baseline sampling techniques like random edge sampling and edge betweenness based sampling.
  - Implemented graph sparsifying techniques by edge sampling (clustering coefficients, effective resistance) especially Local Jaccard Similarity based (L-Spar) to achieve an average Normalised Mutual Information (NMI) score of 80%.
- **Text Generator Streamlit Application**
  (Advisor - Prof. Nipun Batra, IIT Gandhinagar) — Interface Link — Project Link *March 2024*
  - Engineered a pipeline model for next character prediction based on previous k characters.
  - Fine-tuned models on various corpora, including Gulliver's Travels, English Wikipedia 8, Atomic Habits, Tolstoy's Essays, and Alice in Wonderland, with different embedding sizes.
  - Deployed a Streamlit application to enable users to graphically select various hyperparameters for the trained models like varying the token embedding dimensions from 15, 25, till 50.
- **Logical Puzzle and Graph based Games developed using C and C++**
  (Advisor - Prof. Balagopal Komarath, IIT Gandhinagar) — Project Link *Aug 2023 - Nov 2023*
  - Developed 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.
  - Harnessed SFML library of C++ with Entities, Components, Systems paradigm for designing interactive games.
- **Child Safety Monitoring App**
  (Advisor - Prof. Nithin V. George, IIT Gandhinagar) — Project Link *Oct 2023 - Nov 2023*
  - Designed an Android application for a smart bicycle with embedded sensors from a device to ensure child safety.
  - Integrated MATLAB's Simulink Support Package for Android Devices and configured TCP/IP models for efficient data transmission between the child's and parent's devices.

Programming Skills

- **Languages**: Python, C, C++, Verilog, HTML, CSS, Javascript.
- **Technologies**: Xilinx Vivado, LaTeX, Quarto, Git, Adobe Illustrator.
- **Libraries**: PyTorch, NumPy, SciPy, Pandas, Seaborn, Scikit-Learn, Streamlit, TSFEL, SFML (C++).

Achievements and Positions of Responsibility

- **Core Committee Member, Amalthea '23** *(Annual Technical Summit of IIT Gandhinagar)* *April 2023 - Feb 2024*
- **General Member, Technical Council, IIT Gandhinagar** *May 2023 - April 2024*
- Awarded for **Academic Excellence** for highest CPI in AY 2022-23.
- Felicitated with **Dean's List Award** IITGN for **Semester I, II, IV** for excellent academic performance.
- Secured All India Rank of **1297** in the **JEE (Advanced)** and All India Rank of **598** in the **JEE (Main) 2022** Exams.

Relevant Courses

Data Structures and Algorithms II (*Algorithms Design*) [$\mathbf{A}^-$] • Machine Learning [**A**] • Introduction to Data Science [**A**] • Signals, Systems, and Random Processes [**A**] • Probability, Statistics, and Data Visualization [**A**] • Calculus of Single Variable and Linear Algebra [$\mathbf{A}^+$].