

# Shubham Gajjar

Gandhinagar, Gujarat | [+91-9925046075] | [shubham.gajjar14@gmail.com](mailto:shubham.gajjar14@gmail.com)  
[linkedin.com/in/shubham-gajjar](https://linkedin.com/in/shubham-gajjar) | [github.com/ShubhamGajjar](https://github.com/ShubhamGajjar)

## EDUCATION

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**LDRP Institute of Technology and Research**, Gandhinagar, Gujarat  
Bachelor of Engineering (B.E.) - Computer Engineering

*Expected May 2025*

**VPMP Polytechnic**, Gandhinagar, Gujarat  
Diploma - Computer Engineering  
CGPA: 9.22/10.0

*Graduated May 2022*

## TECHNICAL SKILLS

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- **Languages:** Python, Java, JavaScript (JS)
- **ML/DL Frameworks:** TensorFlow, Keras, PyTorch, Scikit-learn, Pandas, NumPy, Matplotlib, OpenCV, Albumentations
- **Web Technologies:** HTML, CSS, Flask, Node.js, React.js, RESTful APIs
- **Databases** MySQL, Neo4J
- **Tools & Platforms:** Git, Google Colab, High Performance Computing, AWS
- **Concepts:** Machine Learning, Deep Learning, Computer Vision (Image Segmentation, Classification), Reinforcement Learning (IQN), Model Optimization (Hyperparameter Tuning, Attention Mechanisms, SE Blocks), Data Structures, Algorithms, Data Preprocessing & Augmentation, Agile Methodologies

## PROJECTS

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### Brain Tumor Segmentation using Hybrid Deep Learning (Research Paper Under Review)

- Led technical design for precise brain tumor segmentation from FLAIR MRI scans.
- Architected and implemented a custom VGG16-MCA UNet model (VGG16 encoder, Multi-Channel Attention decoder) improving segmentation boundary accuracy over standard UNets.
- Developed preprocessing pipeline (normalization, augmentation via Albumentations) and utilized Focal Tversky Loss to address class imbalance.
- Optimized model using Adam optimizer, ReduceLROnPlateau, and EarlyStopping callbacks, achieving 99.59% accuracy and 99.71% specificity on the LGG MRI Segmentation dataset.
- **Technologies:** Python, TensorFlow, Keras, Scikit-learn, Pandas, NumPy, Matplotlib, Albumentations, Google Colab, HPC Cluster.
- **Dataset:** [Custom MRI Dataset \(Kaggle\)](#)

### Skin Cancer Classification with Hair Occlusion Handling (Research Paper Under Review)

- Led development of a novel two-stage pipeline for 7-class skin lesion classification robust to hair occlusion.
- Implemented U-Net++ to generate hair masks, used as auxiliary input to the classification model.
- Designed a custom Extended ResNet50 incorporating Inverse Soft Mask Attention and Squeeze-and-Excitation (SE) blocks to leverage hair mask information effectively.
- Achieved 97.89% classification accuracy on the HAM10000 dataset, outperforming baseline models.
- Utilized Nadam optimizer, Cosine Decay Restarts scheduler, and Sparse Categorical Crossentropy loss.
- **Technologies:** Python, TensorFlow, Keras, Scikit-learn, OpenCV, Pandas, NumPy, Matplotlib, U-Net++, Google Colab, HPC Cluster.
- **Dataset:** [Skin Cancer MNIST: HAM10000](#)

### Reinforcement Learning Agent for TrackMania

- Applied Deep Reinforcement Learning (Implicit Quantile Network - IQN) to train an agent for autonomous track navigation in the TrackMania Nations Forever game.
- Implemented agent using PyTorch, processing combined visual (screen capture via DXCAM) and numerical game state inputs.
- Leveraged TMRL framework and TMInterface for real-time game interaction and data collection.
- Trained agent achieved lap times comparable to human players on default tracks.
- **Technologies:** Python, PyTorch, TMRL, TMInterface, DXCAM, NumPy, OpenCV, Nvidia CUDA.

## EXPERIENCE

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**UPSAAS Technologies LLP**, Gandhinagar, Gujarat

*Jan 2025 - Feb 2025*

*Developer Intern*

- Contributed to a cloud-based data analytics platform, developing/integrating RESTful API endpoints using Python and Node.js for efficient data retrieval and processing.
- Developed front-end components using React.js for data visualization dashboards.
- Optimized a computationally intensive data processing module, resulting in a 20% reduction in query execution time / improvement in application performance.
- Collaborated within an Agile development environment, participating in sprint planning, daily stand-ups, and code reviews using Git for version control.
- Gained exposure to real-time data streaming concepts using Apache Kafka.

## ACHIEVEMENTS & PUBLICATIONS

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- **Publication (Under Review):** Gajjar, S., Joshi, H., Rathod, O., Joshi, D., Barot, V.  
"Extended ResNet50: Inverse Soft Mask Attention for Skin Cancer Classification."  
(Submitted to IEEE, Apr 2025)
- **Publication (Under Review):** Gajjar, S., Joshi, D., Poptani, A., Barot, V.  
"VGG16-MCA UNet: A Hybrid Deep Learning Approach for Enhanced Brain Tumor Segmentation in FLAIR MRI."  
(Submitted to Elsevier, Dec 2024)
- Course Completion: Python For Data Science - IIT Madras (NPTEL Portal, Sep 2023)
- Course Completion: Python Data Structures - University of Michigan (Coursera, Jan 2023)