

ESSHAAN MAHAJAN

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EDUCATION

University of Virginia, Charlottesville, VA

August 2023 - December 2024

Masters of Computer Science: GPA- 3.9/4

Guru Gobind Singh Indraprastha University, New Delhi, India

August 2019 - May 2023

Bachelors of Technology (Computer Science and Engineering): GPA - 3.95/4, Silver Medalist

SKILLS

- **Programming Languages:** Python, C++, Java, SQL, JavaScript, HTML5, CSS3
- **Machine Learning & AI:** Machine Learning, Deep Learning, Generative AI, LLMs, NLP, Computer Vision, Data Analysis, Model Deployment
- **Frameworks & Libraries:** PyTorch, TensorFlow, Scikit-learn, Keras, Pandas, NumPy, Matplotlib, OpenCV, NLTK, React.js, Node.js, Express.js, Bootstrap 5
- **Databases & Cloud:** PostgreSQL, MySQL, MongoDB, GCP, AWS, SQL/NoSQL Databases
- **Tools & Development:** Git/GitHub, REST APIs, Docker, DevOps, Automation, Tableau, Power BI
- **Web Development:** Full-Stack Development, Front-End (React.js, Bootstrap, Responsive Design), Back-End (Node.js, Express.js, REST APIs), Authentication & Deployment

EXPERIENCE

AI Software Engineer, Charlottesville Fine Arts LLC, Charlottesville

August 2025 – Present

- Built an AI copilot with multi-agent systems and RAG to automate interior design workflows, reducing manual effort by ~70%. Developed a full-stack web interface with Node.js, Express.js, and JavaScript, delivering an intuitive front end that streamlined project management for designers.

NLP Researcher/Software Developer, University of Virginia, Charlottesville

February 2025 – September 2025

- Developed a multi-agent RAG framework with risk-aware triage and multi-voice argumentation, deploying DeBERTa models with distributed inference on AWS and a new influence metric to cut covert influence risks by 30% in financial conversations, enabling safer AI-driven investment recommendations and improving user trust.

Software Engineer Intern, Delhi Technological University, New Delhi

November 2021 -November 2022

- Developed an ensemble-based multilingual hate speech and cyberbullying detector using BERT, LSTMs, and traditional classifiers, improving F1 score by 4.44% and releasing a full-stack prototype with API endpoints, web-based interface, and database integration for real-time content moderation. Also contributed to algorithmic research on linear-time sorting techniques, later published and presented.

Software Engineer Intern, IITM (Govt. of India), Pune

April 2022 - October 2022

- Developed a deep learning pipeline for global canopy height estimation (1980–2020) using NASA GEDI LiDAR, meteorological datasets, and Google Earth Engine, optimized on Pratyush HPC. Achieved RMSE 2.02 (state-of-the-art) and delivered scalable workflows in Python and TensorFlow with deployment via Flask REST API, React.js dashboard, and PostgreSQL for climate data visualization.

PROJECTS

Industry Project, Multimodal Mental Health Detection, Virginia

May 2024 – December 2024

- Designed and developed a multimodal AI system combining BERT, ViT, BLIP, and LLaVA-1.6 to detect anxiety, depression, and burnout from 100K+ social media posts, achieving a 3.05% improvement over state-of-the-art models. Built an end-to-end pipeline with PyTorch, HuggingFace, and Scikit-learn, and deployed results via a React.js dashboard and REST API for real-time monitoring.

NLP/CV Research Project, Entity Classification in Memes (IITD), New Delhi

November 2021 - July 2022

- Led development of a multimodal meme classification system integrating BERT embeddings, CLIP image models, and OCR pipelines to identify entities (hero, villain, victim, other) in 50K+ samples, improving performance by 20% over baselines.
- Engineered a scalable pipeline with Python, PyTorch, and Scikit-learn, deploying as cloud-hosted APIs with interactive dashboards and relational database integration on AWS to enable real-time meme analysis and visualization.

PUBLICATIONS

- *EnsMulHateCyb: Multilingual Hate Speech and Cyberbully Detection in Online Social Media. Expert Systems with Applications*, 2023.
- *Hunch Emplacement Sort. International Conference on Graphs, Networks and Combinatorics (ICGNC)*, 2022.