

TARUN GANGADHAR VADAPARTHI

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EDUCATION

CITY UNIVERSITY OF NEW YORK, GRADUATE CENTER

Doctor of Philosophy in Computer Science

New York, New York, USA

Aug 2026 – Present

UNIVERSITY AT BUFFALO

Masters in Computer Science and Engineering

GPA: 3.933/4.0

Buffalo, New York, USA

Aug 2024 – Dec 2025

VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY

Bachelor of Technology in Electrical and Electronics Engineering

GPA: 7.31/10

Nagpur, Maharashtra, IND

Dec 2020 - May 2024

UNIVERSITY OF OXFORD

Summer School in Artificial Intelligence and Machine Learning

Grade: A+

Oxford, England, UK

Jun 2023 - Jul 2023

PERSONAL PROJECTS

Physics-Guided 3D Scene Reconstruction [[Website](#)] [[Github](#)] [[PDF](#)]

- Designed a lightweight physics-guided 3D reconstruction framework with **semantic rigid/deformable separation** with sinusoidal wind fields, reducing splat count from 364k $\rightarrow$ 100k (72%) while retaining scene fidelity.
- Applied **graph Laplacian smoothing** to stabilize deformable dynamics, producing consistent water/rigid segmentation (29% water vs 71% rigid) and removing 13k false splats for cleaner structural integrity.

Unpaired Day to Night Translation (CycleGAN) [[Website](#)] [[Github](#)] [[PDF](#)]

- Trained a CycleGAN (ResNet-9, PatchGAN) with **LSGAN and cycle/identity losses** on the BDD100K dataset, reaching A $\rightarrow$ B (SSIM 0.83, PSNR 24.9, LPIPS 0.210) and B $\rightarrow$ A (SSIM 0.83, PSNR 25.2, LPIPS 0.199).
- Engineered a reproducible pipeline with data preprocessing (resize, crop, flip), Adam (2e-4) optimization, TorchScript checkpoints, and automated evaluation on Tesla T4 GPUs.

Video Stabilization with Deep Learning [[Website](#)] [[Github](#)] [[PDF](#)]

- Applied **RAFT optical flow** on the UCF101 dataset to extract motion vectors, training **Bi-LSTM, Transformer, and GRU** models for temporal smoothing of camera trajectories.
- Reduced motion jitter variance from 0.159 $\rightarrow$ 0.105 (1.51 $\times$ improvement); Bi-LSTM converged to 0.415 MSE, outperforming GRU (0.422) and Transformer (1.02), with trajectory plots and output confirming smoother stabilized paths.

Semantic Fusion for Multi-View 3D Perception [[Website](#)] [[Github](#)] [[PDF](#)]

- Integrated **Segment Anything (SAM)** with multi-view projection and majority voting to assign semantic labels across 1.9M splats, ensuring consistent class mapping across different viewpoints.
- Achieved semantic rendering in 8 novel views, detecting up to 15 object categories (walls, floor, furniture) and maintaining cross-view stability without requiring any 3D supervision.

Efficient 3D Scene Pruning and Representation [[Website](#)] [[Github](#)] [[PDF](#)]

- Developed a pruning pipeline combining **SH color energy, multi view visibility, local density, silhouette hit-rate, and projected area** via z-score fusion, pruning 40–60% of splats while preserving near-baseline fidelity.
- Delivered 27 dB PSNR at 40% kept and 29.4 dB PSNR at 60% kept, outperforming opacity and area thresholds (13–18 dB) and removing floaters while retaining fine low-albedo details.

FREELANCE PROJECTS

LLM Chatbot Developer

Jan 2025 – Feb 2025

- Led a team of 4 developers to design and deploy a **RAG chatbot** for document and web-based Q&A, built with **Python, LangChain, ChromaDB**, and the **OpenAI API**.
- Constructed scalable pipelines for document parsing (PDF, DOCX, TXT), embeddings, and retrieval with web scraping modules, increasing knowledge access efficiency by 35%.

EXPERIENCE

CITY UNIVERSITY OF NEW YORK, GRADUATE CENTER

New York, New York, USA

Graduate Research Assistant

Apr 2026 – Present

- Conducting research on static program analysis techniques for improving the reliability and maintainability of machine learning software.
- Reviewing research on ML frameworks and identifying opportunities to develop automated analysis and program transformation tools.

VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY

Nagpur, Maharashtra, IND

Undergraduate Research Assistant

Aug 2023 – May 2024

- Architected a Python-based compiler and parser (**PLY, AST**) to convert optimization models into structured MILP formulations, which reduced model preprocessing time by 30% and standardized workflows for future use.
- Linked industrial grade solvers (**Gurobi, CPLEX, HiGHS, Xpress**) and optimized constraint execution with NumPy and multiprocessing, achieving a 25% solver speedup while ensuring numerical stability.

HITACHI SOLUTIONS

Hyderabad, Telangana, IND

Data Engineer Intern

May 2022 – Aug 2022

- Orchestrated enterprise-scale data workflows with **Azure Data Factory & Pipelines**, processing 2M+ daily records from diverse sources into a centralized data lake for analytics.
- Streamlined ETL pipelines with **Azure Databricks** and **SQL Server**, reducing runtime by ~35% and improving SLA compliance for downstream reporting.

VERTICROSS INDIA

Hyderabad, Telangana, IND

Software Engineer Intern

May 2021 – Dec 2021

- Developed and maintained Java-based SOAP web services for enterprise software applications, enabling data exchange between internal and external systems.
- Integrated and tested XML/WSDL service endpoints, debugged request and response issues, and supported backend components for industrial projects.

PUBLICATIONS

<https://scholar.google.com/citations?user=Z967hFwAAAAJ&hl=en%20target=>

1. Bimal Kumar Dora, Tarun Gangadhar, Arghya Mitra, Nidhi Haribhau Gaikwad, Ruchita Sunil Waghmare, Damien Ernst, Pranjali Kulkarni, Sudip Halder, Sunil Bhat, “Cost Optimization of Renewable Energy Installation in a Four-Microgrid System Using GBOML”, in *IEEE Fifth International Conference on Sustainable Energy and Future Electric Transportation (SeFet)*, 2025. [[Paper](#)]
2. Bimal Kumar Dora, Sudip Halder, Ruchita Sunil Waghmare, Tarun Gangadhar, Pranjali Kulkarni, Sunil Bhat, “Solution of Optimal Power Flow Problems Using Enhanced Hunter-Pray Optimization Algorithm”, in *IEEE Third International Conference on Power Electronics, Intelligent Control and Energy Systems (ICPEICES)*, 2024. [[Paper](#)]

TECHNICAL SKILLS

Programming & Frameworks: Java, Spring Boot, Python, C++, PyTorch, TensorFlow, SQL, MATLAB

Machine Learning & AI: Deep Learning, Computer Vision, Representation Learning, and Image/Video Processing

Cloud & Data Engineering: Azure, Hadoop, Apache Spark, ChromaDB, LangChain

Tools & Platforms: Open3D, OpenCV, Git/GitHub, Docker, REST APIs, Linux

POSITIONS OF RESPONSIBILITY

THE BALDY CENTER FOR LAW AND SOCIAL POLICY

Buffalo, New York, USA

Podcast Host/Producer

Aug 2024 – Dec 2025

- Conducted 5+ podcast episodes featuring academic and professional guests and edited using AI tools.

VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY

Nagpur, Maharashtra, IND

Student Mentor

Aug 2022 – May 2024

- Mentored 15 freshmen students for 2 years, providing academic and non-academic guidance.

GOOGLE DEVELOPER STUDENT CLUBS

Nagpur, Maharashtra, IND

Multimedia Lead

Aug 2022 – May 2023

- Conducted workshops on Web Development, Cloud, and Flutter for 100+ students.