VARAD PARADKAR

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Education

University of North Carolina at Charlotte, Charlotte, NC May 2026
Master of Science in Computer Science
Savitribai Phule Pune University, Pune, India June 2022
Bachelor of Engineering in Computer Engineering

Technical Skills

- **Programming Languages:** Python, C#, C++, Java, JavaScript, GLSL, Kotlin, HLSL
- **Frameworks and Tools:** PyTorch, Unity3D, Unreal Engine, WebGL, Blender, PostgreSQL, MongoDB, Express, Node, React, Numpy, Pandas, Power BI, Tableau, SolidWorks, Ansys, MATLAB, Git, Docker, Kubernetes, Jira
- **Machine Learning:** Neural Networks, CNNs, GNNs, RNNs, VAEs, GANs, NeRF, 3D Gaussian Splatting, Transformers, Neural Rendering, Deep Generative Models, Reinforcement Learning, Deep Learning

Research

Graphic-driven Human Activity Recognition using mmWave Radar *Advisor: Dr. Hongfei Xue*
Technologies: PyTorch, SMPL-X, 3D Gaussian Splatting (3DGS), NeRF, GANs

- Built hybrid NeRF-3DGS pipeline with SMPL-X human models to synthesize mmWave radar datasets, resolving sparse data limitations (500→50k samples) using differentiable radar projections.
- Engineered physics-based ray tracer simulating multipath effects, achieving 92% correlation with real 60 GHz radar signals via motion heatmap synthesis from skeletal data.
- Designed GAN framework refining synthetic I/Q signals, boosting activity classification F1-score by 18%
- Integrated HUGS-optimized NeRF with occupancy grid pruning, accelerating training convergence by 65% on multi-GPU clusters. Deployed mmGPE recognition system achieving inference – 3.8× faster than prior SOTA methods.

Experience

Data Engineer — Montezuma AI August 2023 – May 2024
PCMC Smart City Data Intelligence System
Technologies: PostgreSQL, Python, Apache Airflow, REST APIs, Power BI, Tableau, Node.js, React

- Led development of a city-wide data intelligence platform for Pimpri Chinchwad Municipal Corporation, designing scalable PostgreSQL databases and integrating web interfaces to streamline municipal operations.
- Developed end-to-end ETL pipelines with Python and Apache Airflow to ingest, clean, and normalize 10TB+ of diverse datasets, implementing encryption and role-based access to ensure GDPR compliance.
- Automated data enrichment by integrating REST APIs to dynamically append geospatial metadata and citizen feedback, reducing manual preprocessing time by 40% accelerating analytics workflows.
- Engineered interactive dashboards with Power BI and Tableau to visualize KPIs for city planners, increasing stakeholder engagement by 80% and enabling data-driven decisions that reduced traffic by 15% in pilot zones.

Software Development Lead — Jnana Prabodhini June 2022 – December 2022
Projects: Aranya (AR Forest Simulation), Chemistry VR (Educational Lab)
Technologies: Unity3D, C#, ARCore, Git, Jira, Google Play Console, Trello, Blender, Milanote

- Spearheaded end-to-end development of 2 educational AR/VR apps (*Aranya*, *Chemistry VR*) with a cross-functional team, delivering both projects 2 weeks ahead of deadline through agile sprint planning and iterative prototyping.
- Architected core systems including dynamic terrain rendering and interactive AR object tracking using ARCore, while optimizing shaders to achieve 60 FPS on mid-tier Android devices.
- Pioneered workflow automation by integrating Git hooks with Unity's Asset Pipeline, reducing merge conflicts by 60% and accelerating artist-asset integration for 500+ 3D models/textures.
- Drove adoption of Trello-Milanote boards for sprint tracking and asset organization, improving team velocity by 40% and enabling concurrent development of AR environmental interactions.

Software Development Intern — Jnana Prabodhini January 2019 – June 2022
Projects: Megh (AR Weather Education), Sarita (River Ecosystem Simulation)
Technologies: Unity3D, C#, AR Foundation, OpenGL, Photoshop, Audacity, Git, Google Play Console

- Developed 2 Android AR educational apps (*Megh*, *Sarita*) reaching 50K+ downloads with a 4.5/5 rating.
- Implemented AR Foundation plane detection for 95% tracking accuracy and optimized sprite-based ecosystems by 40% using texture atlasing.
- Designed asset pipeline collaborating with 3 artists and 2 educators, standardizing 300+ sprites/textures format in Photoshop, and compressing audio assets using Audacity's noise reduction filters.

- Engineered cross-device support (OpenGL ES 2.0/3.0) ensuring 45 FPS on low-end devices while maintaining HD visuals on flagships.
- Automated GitLab CI/CD for APK builds, localized listings in 3 Indian languages, and improved user onboarding flows by 35%.
- Published a research paper highlighting development of *Megh* and *Sarita* ***"Megh and Sarita – Educational App Development"*** International Journal of Advanced Research in Science, Communication and Technology (IJARSCT), Volume 2, Issue 5, May 2022.

Design Engineer — Stallion Motorsport July 2018 – June 2020
Formula Student Electric & Combustion Vehicle Development
Technologies: SolidWorks, Ansys, Tableau, MATLAB Simulink, DAQ Systems

- Led data-driven optimizations in MATLAB and Tableau for vehicle telemetry analysis, improving lap times by 40%.
- Designed and prototyped drivetrain and wheel assemblies using SolidWorks and Ansys, reducing unsprung mass by 28% while maintaining structural integrity at high speeds.
- Integrated real-time data acquisition and an iterative testing framework for on-the-fly driver adjustments, boosting handling consistency by 30% and accelerating performance tuning cycles.

Projects

PCMC Smart City Data Intelligence System — Montezuma AI August 2023 – May 2024

- Led a city-wide data platform for PCMC, designing scalable PostgreSQL databases and Python/Airflow ETL pipelines to manage 10TB+ of municipal data, enforcing GDPR compliance via encryption and role-based access.
- Developed anomaly detection and monitoring frameworks for city-wide sensor data using Splunk and SQL.
- Automated data enrichment with REST APIs and developed interactive dashboards (Power BI/Tableau), reducing manual preprocessing by 40% and enabling data-driven decisions that cut traffic by 15% in pilot zones.

Aranya — Jnana Prabodhini, Pune June 2022 – January 2023

- Led a six-person, cross-functional team from concept to Play Store deployment, leveraging Unity3D, ARCore, and optimized asset pipelines to create an immersive forest simulation for middle school students.
- Served as Lead Programmer, integrating AR modules with interactive game design, achieving consistent 60 FPS on mid-tier devices and fostering engaging fauna behavior for a high-impact learning experience.

Chemistry VR — Jnana Prabodhini, Pune June 2022 – January 2023

- Spearheaded an educational VR lab experience for middle/high school students, managing a cross-functional team and delivering the project ahead of schedule through agile sprints and iterative prototyping.
- Integrated immersive VR modules with C# scripting in Unity3D, optimizing performance for Oculus VR while simulating realistic chemical reactions to enhance interactive learning outcomes.

Sarita — Jnana Prabodhini, Pune June 2021 – August 2022

- Built an interactive Unity-based experience detailing virtual river journeys, integrating narrative and mini-documentaries to enhance environmental education for middle/high school learners.
- Oversaw development, testing, optimization, and version control (Git), including texture atlasing for 2D assets and particle systems for water effects, ensuring smooth performance across a range of Android devices.

Megh — Jnana Prabodhini, Pune June 2021 – April 2022

- Developed an AR-driven educational app focused on cloud formation and geography for middle school students, seamlessly integrating 2D and 3D simulations for an engaging learning experience.
- Overcame performance constraints on low-end devices by optimizing textures, minimizing draw calls, and refining AR components, ensuring smooth app performance across diverse hardware.