Prashanth Vangari

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Professional Summary

AI Research Engineer specializing in **3D Computer Vision** and **Deep Learning** for autonomous systems. Proven expertise in developing custom **Transformer architectures** for 3D point cloud processing and human pose estimation. Proficient in visual perception pipelines for self-driving cars, including object detection and motion estimation.

Technical Skills

Languages & Frameworks: Python, C++, CUDA, SQL, PyTorch, TensorFlow

3D Computer Vision: 3D Reconstruction, Depth Estimation, Visual Odometry, Environment Perception, Stereo Vision

Tools: Open3D, OpenCV, Point Cloud Library (PCL), Git, Docker, Linux, AWS

Work Experience

Full-Time Research Assistant, *University of North Texas* April 2025 – Present

- **Project: Human Pose Estimation in 3D Point Clouds**
- Architected an end-to-end **3D perception pipeline** to estimate skeletal keypoints from sparse depth data in autonomous environments using **Transformer** based architectures.
- Engineered a **3D preprocessing pipeline** using **Open3D** and **DBSCAN** to isolate **human subjects** from **100K+ depth frames**.
- Developed a custom **feature embedding module** using sequential **LBR blocks**; transformed **2,048 coordinates** into a **256-dim feature vector**.
- Implemented a custom **Point Cloud Transformer (PCT)** in **PyTorch** to regress **15 skeletal keypoints**, achieving a **5.1% relative accuracy improvement** through iterative tuning.
- Architected a **modular feature encoder** with **8 sequential attention blocks** using an **Offset-Attention mechanism** to capture **long-range spatial dependencies**.
- Designed a **pose regression decoder** using **global pooling** and **MLPs** to predict accurate **3D joint coordinates**.

Lead AI (Computer Vision) Research Engineer, *SkillTree LLC* Sept 2025 – Present

- Engineered an **on-device iOS system** for **fine-grained pose classification**, reaching **95.1% accuracy** through highly optimized **real-time inference** models.
- Engineered a **spatio-temporal model** for repetition counting, utilizing **multi-frame LSTMs** to improve **temporal consistency** and accuracy in dynamic environments.
- Optimized models for **mobile deployment** using **CoreML** and **quantization**, achieving a **18 ms latency**.

Associate Consultant, *KPMG Global Services Private Limited* Jan 2022 – Jan 2023

- Developed **web applications** to automate **transfer, requisition, and order** workflows using **low-code** platforms.
- Built **UI interfaces**, **workflow models**, and **databases** supporting operations across multiple countries.

Project Engineer, *Wipro Limited* June 2019 – Jan 2022

- Developed **web applications** by migrating **six high-risk Excel-based financial tools** using **low-code**.
- Built **frontend components**, **backend workflows**, and managed **deployments** through **CI/CD pipelines**.

Personal Projects

Autonomous Vehicle Perception & Localization Pipelines 2025

- Developed a 3D pipeline using **Essential Matrices** for Visual Odometry and **Stereo Back-projection** to map pixel coordinates to world space for **drivable space** estimation.

Education

Master of Science in Computer Science, University of North Texas **GPA: 4.0/4.0** Jan 2023 – Dec 2024

Bachelor of Technology in Electronics & Communication, GCET Aug 2015 – May 2019