

Tezuesh Varshney

Co-Founder & ML Engineer, Singularity Forge

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Experience

Singularity Forge *Co-Founder & ML Engineer April 2025 - Present*

- Leading SaaS development, including:
 - **RevQA**: An AI-powered sales coaching platform that analyzes sales call recordings and roleplay sessions to deliver instant, actionable feedback.
 - **Logo Generation App**: Utilizes AI prompt orchestration and brand automation for dynamic logo creation.
 - **Voice-to-Text Notetaking App**: Optimized for decentralized knowledge workflows.
- Designing algorithms across multiple subnets in the Bittensor ecosystem for **mining operations**.
- Leading R&D in **Satellite and Drone Technology** for environmental mapping. This involves leveraging advanced models like DINO v3 and in-house solutions, integrating machine learning and sensor fusion to identify landmines, map red zones, and create detailed 3D environmental models.

Omega Labs *AI Engineer August 2024 - April 2025*

- **Any-to-Any Multimodal Models**: Leading development of models enabling seamless modality transformations, integrating image functionality into speech-to-speech models.
- **Diarization Pipeline**: Built a system to scrape, process, and transcribe YouTube audio, generating a dataset of 60,000+ rows on Hugging Face with an integrated audio quality scoring mechanism.
- **Speech-to-Speech Models & Evaluation**: Developed speech-to-speech models, fine-tuned Mini-Omni, and built evaluation frameworks to assess model performance across multiple modalities.

Samsung Research & Development *Senior AI Engineer, Visual Intelligence team December 2021 - December 2024*

- **Portrait Relighting**: Developing studio relighting and dramatic effect solutions by training LORA for **Stable Diffusion**, set for Samsung S25.
- **OnlyMe Video Call**: Developed a 60 FPS video **instance segmentation** model for Samsung Galaxy S24.
- **Selfie Camera Bokeh**: Contributed to an **instance segmentation algorithm** for S23, Flip4, and Fold4, achieving 97.2 IoU and 60 ms inference.

Vision CAIR Lab, King Abdullah University of Science and Technology *Research Assistantship September 2021 - March 2022*

- Worked with **Professor Mohamed H. Elhoseiny**, former visiting Faculty at Stanford Computer Science, on 3D COMPaT dataset creation.
- Developed **3D COMPaT**, a large annotated 3D dataset with part-material composition, and published it in **ECCV 2022 Oral Track**.
- Proposed and developed a new approach for segmenting part-material pair in 3D object images, using state-of-the-art techniques like **branched DETR**.

Embodied AI Lab, University of California San Diego *Research Assistantship July 2021 - September 2021*

- Collaborated with **Prof. Hao Su** on **single-image to 3D shape reconstruction**.

- Proposed a compositional learning framework for estimating **3D shape from 2D images** using localized modules and substructure factorization.

Machine Learning Lab, Indian Institute of Science *Research Assistantship July 2020 - July 2021*

- Researched unsupervised **LiDAR reconstruction** using **GANs and Auto-encoders**.
 - Developed training techniques for **Variational Autoencoders** with global and local feature modeling using **DCT**.
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Education

Zakir Husain College of Engineering & Technology, AMU *B. Tech in Computer Engineering, 2020 CGPA: 9.017/10.0 Thesis: Analogy Generation*

Skills

- **Generative AI:** Diffusion Networks, GANs, Autoencoders, 3D Representation Learning
 - **Programming languages:** Python, C++, SQL
 - **Machine learning tools:** PyTorch Lightning, PyTorch, TensorFlow, Hugging Face
 - **Image processing libraries:** OpenCV, PIL, Albumentations
 - **Web3 & Blockchain:** Bittensor, TAO mining, decentralized agents
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Projects

- **3D Point Cloud Modeling:**
 - PyTorch implementation of Learning Representations and Generative Models for 3D Point Clouds.
 - Implemented **Chamfer Distance** and **Earth Mover Distance** from scratch.
 - Generative Modeling on ShapeNet dataset using **Autoencoder and GANs**.
 - **Apery:**
 - Developed **Heuristic algorithms** to generate **artistic images**.
 - Applied transfer learning concept to **image style transfer** using pre-trained VGG19 model.
 - Employed the **Hill Climbing algorithm** to **reconstruct images** by utilizing simple and fundamental shape primitive.
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Papers and Survey

- Ujjwal Upadhyay, Yuchen Li, Habib Slim, **Tezuesh Varshney**, Ahmed Abdelreheem, Arpit Prajapati, Suhail Pothigara, Peter Wonka, and Mohamed. Elhoseiny. **3DCoMPaT: Composition of materials on parts of 3d things**. In 17th European Conference on Computer Vision (ECCV), 2022.
 - Mansi Agarwal and **Tezuesh Varshney**. **Survey on Zero-Shot Learning and its application**.
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Awards

- Received a **Certificate of Appreciation** for making valuable contributions in the S24, S23, Flip4, and Fold4.
- Won **HackData 2019**, 24-hr hackathon organised by Shiv Nadar University.
- Amongst 25 students, throughout the University, to be awarded with **Sir Syed Global Scholar Award 2019**.
- Achieved **4th position** out of 128 teams in the **Autonomous Underwater Vehicle Competition NIOT SAVE 2019**, which was organized by IIT-Madras.
- Qualified as best team from AMU for **ACM-ICPC Online Round 2017-18**.
- Established **AMU-OSS an Open Source Software (OSS) Society** in college which now has more than 150 students.
- Qualified **Google CodeJam 2018** and **SnackDown 2018**.