

# Kunal Kamalkishor Bhosikar

Website LinkedIn Scholar GitHub

✉ kunalbhosikar@gmail.com

☎ +91 7770080715

## EDUCATION

### International Institute of Information Technology, Hyderabad (IIITH)

B.Tech + MS by Research in Computer Science and Engineering

Advisor: Dr. Charu Sharma

Hyderabad, IN

Jul. 2022 – Present

CGPA: 7.38/10

## EXPERIENCE

- **Research Intern** Delhi, IN  
*TCS Research* May 2025 – August 2025
  - Supervisor: Dr. Lokender Tiwari
  - Worked on mesh simplification techniques for efficient use in VR environments. Developed a novel algorithm to simplify mesh preserving important geometry and texture. This work is under review in CVPR 2026.
  - Another project based on object motion aligned with human hand motion in VR.
- **Undergraduate Researcher** Hyderabad, IN  
*Machine Learning Lab, IIIT Hyderabad* May 2023 – Present
  - Conducting research under the guidance of Dr. Charu Sharma and Dr. Kai Han (HKU) in 3D Computer Vision.
  - Focused research on 3D Computer Vision and Graphics, including 3D Human Pose Estimation, Human-Object/Scene Interaction, and 3D Human Co-Speech Motion and Emotion Generation with Text Prompts.
- **Software Development Extern** Remote  
*Chotu* January 2023 – April 2023
  - Migrated a website from WordPress to Strapi, and built a responsive front-end using React.js to enhance user experience and performance. Deployed the project on an AWS EC2 instance.

## PUBLICATIONS

- Sharma, C., **Bhosikar, K.**, Mahajan, V., Jain, M. (2025). System and Method for Detecting Exercise Poses and Counting Repetitions based on Joint Angles. **Indian Patent Published.**
- Rajan, S.\*, **Bhosikar, K.\***, Sharma, C. (2025). InteracTalker: Prompt-Based Human-Object Interaction with Co-Speech Gesture Generation. **WACV 2026.**
- **Bhosikar, K.**, Katageri, S., Madhavaram, V., Han, K., Sharma, C. (2025). MOGRAS: Human Motion with Grasping in 3D Scenes. **BMVC SUHM Workshop 2025.** (Link)
- **Bhosikar, K.**, Savalia, P., Tiwari, L., Bhowmick, B. (2025). FA-QEM: Fast and Robust Mesh Simplification with Geometry and Appearance Preservation. **Under Review CVPR 2026.**

## PROJECTS

- **Imitation Learning for UAV Obstacle Avoidance** (Github Link)
  - Implemented Behavior Cloning and DAgger for UAV obstacle avoidance via expert demonstrations.
  - Evaluated success rates in avoiding obstacles. Compared BC & DAgger in performance and generalization.
- **Dense 3D Reconstruction Using Stereo Matching** (Github Link)
  - Developed a pipeline for dense 3D reconstruction using Semi-Global Matching and PatchMatch algorithms.
  - Validated the pipeline on the KITTI Stereo Dataset, demonstrating applications in autonomous navigation.
- **Vision-Language Guided Super-Resolution** (Github Link)
  - Designed a Vision-Language Model-based pipeline to enhance handheld multi-frame super-resolution.
  - Introduced novel metrics to evaluate performance and achieved superior noise reduction.
- **Dynamic Graph Contrastive Learning for Medical Report Generation** (Github Link)
  - Developed a framework integrating dynamic knowledge graphs and contrastive learning to improve accuracy.
  - Achieved state-of-the-art results on the IU-Xray dataset using advanced metrics.
- **BiVE: Advancing Bi-Level Knowledge Graph Embeddings for Enhanced Reasoning**(Github Link)
  - Developed the BiVE model for advanced reasoning tasks like triplet prediction and link prediction.
  - Improved performance with data augmentation (random walks), ablation studies on loss functions, and experimentation with Simplicial Neural Networks (SNNs).
- **Query-Guided Multi-Perspective Answer Summarization**(Github Link)
  - Created a query-guided framework using BART and T5 for multi-perspective answer summarization
  - Combined ranking (BM25, bi-encoder, cross-encoder) with abstractive summarization, enhancing extraction and synthesis in community Q&A forums.

- **Prompt Tuning on GPT-2 for Multiple NLP Tasks**(GitHub Link)
  - Designed and implemented Prompt Tuning on GPT-2 using soft prompt embeddings.
  - Trained and evaluated the model on summarization, Q&A, and translation using ROUGE, F1, and BLEU.
- **Implementing a Transformer-based Machine Translation Model**(GitHub Link)
  - Designed a Transformer-based Machine Translation model from scratch, trained on an English-French corpus.
  - Demonstrated the self-attention mechanism and evaluated the model's translation quality using the BLEU metric.
- **Implementing and Evaluating ELMo: Deep Contextualized Word Representations**(GitHub Link)
  - Developed the ELMo architecture from scratch in PyTorch, pretrained via bidirectional language modeling.
  - Conducted a thorough performance analysis of ELMo on the AG News 4-way sentiment classification task.
- **Comparative Analysis of Neural Network-based Language Models**(GitHub Link)
  - Implemented three language models: Feedforward (5-gram), RNN (LSTM), and Transformer Decoder.
  - Analyzed the comparative performance of the models on train and test sets to assess architectural strengths.
- **Distributed Cache – Redis**(GitHub Link)
  - Engineered a highly available, scalable, low-latency distributed caching system (Redis-inspired).
  - Implemented data partitioning, replication, eviction policies, and a custom API for efficient Redis-like caching.
- **Online Workout Application**(GitHub Link)
  - Developed an interactive workout application for Xtraliving using the MERN stack (React.js, Node.js, MongoDB).
  - Implemented real-time pose detection using the Posenet and BlazePose models to provide detailed user reports and enhance the exercise experience.
- **Water Quality Analysis and Prediction.**(GitHub Line 1), (GitHub Link 2)
  - Created an interactive map of India to do a Water Quality Analysis across all the states.
  - Developed a website for Water Quality Index (WQI) prediction using a Spark-ML sequential model.
- **C Shell**(GitHub Link)
  - Developed a Linux based shell implemented in C. The shell is equipped with advanced and complex features such as input/output redirection, piping, signal handling, and command autofill.
- **Enhanced XV6**(GitHub Link)
  - Implemented four scheduling algorithms (FCFS, LBS, PBS, MLFQ) to enhance the XV6 operating system kernel.
  - Integrated the scheduler and trace system call by modifying kernel source and conducting performance evaluation.

## SKILLS

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- **Programming Languages:** C/C++, Python (PyTorch, NumPy, Pandas, OpenCV, Scikit-learn, TensorFlow), Java, JavaScript, SQL/MySQL/MongoDB
- **Web Development:** React.js, Node.js, Bootstrap, HTML, CSS
- **Tools and Technologies:** Bash Scripting, Docker, Git, Huggingface, SMPL, MERN

## KEY POSITIONS

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- **Teaching Assistant** 3D Vision Summer School 2024, Bangalore, IN
  - Organized by IIIT Hyderabad and IIIT Bangalore, focusing on 3D Vision topics.
  - Led hands-on sessions on frameworks like PointNet, MeshCNN, and NeRF.
- **Teaching Assistant - Software Systems Development (Fall 2025)** IIIT Hyderabad, IN
  - Worked under Prof. Sai Anirudh and Prof. Abhishek Singh. Conducted and taught labs on JavaScript, Python(Functions, Data Structures, File Handling, Exception Handling), and Python Libraries(Numpy, Pandas, Matplotlib).
  - Designed assignments, graded exams, evaluated labs and conducted vivas.
- **Mentor** IIIT Hyderabad, IN
  - Mentored 60 first-year students in foundational courses - Data Structures and Linear Algebra.
  - Provided personalized support to enhance problem-solving and conceptual understanding.

## ACHIEVEMENTS

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- **Megathon 2022** Hyderabad, IN
  - Secured first place in Qualcomm's track by developing a solution for accent detection.
  - Applied techniques like Spectrograms, CNNs, and data augmentation to achieve high accuracy.

## RELEVANT COURSE WORK

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Algorithm Analysis & Design, Operating Systems & Networks, Data & Applications, Machine, Data, & Learning, Statistical Methods in AI, Topics in Applied Optimization, Advanced NLP, Optimization Methods, Topics in Deep Learning, Computer Vision, Digital Image Processing, Fairness, Privacy, & Ethics in AI, Mobile Robotics, Topics in Reinforcement Learning