

# Akash S Kumbar

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## ✍ ABOUT ME!

As someone who is passionate about the possibilities of computer science, I have a strong interest in 3D computer vision, computer graphics, mixed reality, and artificial intelligence. My relentless drive to explore these fields has led me to constantly seek new challenges and push my limits. I am dedicated to utilizing my skills to develop innovative solutions that can improve the way we interact with technology and enhance the human experience.

## 🔑 INTERESTS

Machine Learning, Deep Learning, 3D Vision, Computer Graphics, Computer Vision, Software development, Embedded systems, Game Development, AR/VR/XR

## 📁 PROFESSIONAL EXPERIENCE

**Research Intern,** Jan 2023 – present  
Center of Excellence in Visual Intelligence, KLE Technological University  
Researching on 3D computer vision, representational learning and refinement of point cloud data. Hubli, India

**Student Volunteer,** Aug 2021 – present  
Center of Excellence in Visual Intelligence, KLE Technological University  
Worked on the refinement of 3D point clouds. Additionally, I volunteered as a resource person and mentor to help others explore the point cloud domain. Hubballi, India

## 🎓 EDUCATION

**B.E.,** KLE Technological University 2019 – 2023  
Electronics and Communication Engineering  
CGPA: 8.30/10.0 (till 7th sem) Hubli, India

**Pre University College (12th grade),** JSS SMPU 2017 – 2019  
Percentage: 82% Dharwad, India

**Tenth grade,** JSS SMCS 2017  
CGPA: 9.2/10.0 Dharwad, India

## 🧠 SKILLS

**Programming**  
*Python, C/C++, MATLAB, Simulink*

**Machine learning/Deep Learning**  
*PyTorch, Tensorflow, popular Anaconda libraries*


**Computer Vision**  
*3D vision, 3D deep learning, Images, Gesture recognition*

**Computer Graphics**  
*OpenGL*


## 📁 PROJECTS

**3D Point Cloud Refinement Using Explicit Prior,** [Completed as a part of Sponsored Research Project]  
Proposed a novel methodology, to upsample and denoise 3D point cloud for better representation, and to recover missing information for better reconstruction. ☑  
**Tools used:** Python, PyTorch, PyTorch3D, Open3D


**Camera based vehicle functions,** [Completed as a part of Bosch's PRIXEL program] Designed a computer vision solution to detect potholes and speed breakers on roads, utilizing a custom-engineered dataset that was collected and annotated in-house. ☑  
**Tools used:** Python, PyTorch, ONNX, OpenCV

**3D Point Cloud Instance Segmentation**, Proposed a U-Net based deep learning architecture for instance segmentation of 3D point clouds, we devised an encoder that was capable of learning the global features of the point cloud. 


**Tools used:** Python, PyTorch, PyTorch3D, Open3D

**Learning based refinement of 3D point clouds through hole filling**, Developed a deep learning model to identify and repair point cloud gaps caused by occlusion and reflections. Designed an algorithm to generate datasets with realistic holes in point clouds for training and testing purposes. 

**Tools used:** Python, PyTorch, PyTorch3D, Open3D

**Gesture based hand-cricket game**, Developed a computer vision-based game of 'hand-cricket' playable against a computer through webcam. The backend is powered by a Tensorflow image classification model, with the front-end built on OpenCV and PyGame. 

**Tools used:** Python, Tensorflow, OpenCV

**Guitar Bot**, Created a bot using Arduino that can play guitar and built an android application that lets you select the music. 

**Tools used:** Arduino, Embedded C, MIT app inventor

## COURSES AND CERTIFICATIONS

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**3D Vision Summer School**, International Institute of Information Technology, Hyderabad 

**Advanced Computer Graphics**,

Collaboratively offered by Indian Institute of Technology-Delhi and KLE Technological University

**PyTorch for Deep Learning and Computer Vision**, Udemy 

**Data Structures**, UC San Diego, Coursera 

## AWARDS

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**Certificate of appreciation in Bosch's PRIXEL Program**, Bosch Global software technologies 


Awarded for developing a robust, real-time computer vision-based, speed breaker, and pothole detection model.

**Best project award in CEVI summer workshop**,

Center of Excellence in Visual Intelligence, KLE Technological University

Awarded Best Project at CEVI Summer Workshop for Gesture-based Hand-Cricket game.

**Certificate of appreciation for engineering exploration course project**,

Centre for Engineering Education Research, KLE Technological University 

Awarded as an outstanding project for making a Guitar bot using Arduino that plays music through a mobile app.

## REFERENCES

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**Ramesh Ashok Tabib**,

Asst. Professor at SoECE, KLE Technological University | Researcher at Center of Excellence in Visual Intelligence, KLE Technological University

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**Uma Mudenagudi**, Dean R&D, KLE Technological University | Professor, SoECE, KLE Technological University

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## DECLARATION

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I hereby declare that the details and information given above are complete and true to the best of my knowledge.



**Akash Kumbar**  
24th March 2023