Akash S Kumbar

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ABOUT ME!

Passionate about the endless possibilities of computer science, I am driven to explore the fields of **3D computer vision, computer graphics, mixed reality, and artificial intelligence**. With a deep interest in **machine learning, deep learning, and software development**, I am constantly seeking new challenges to push my limits. My dedication to creating innovative solutions that enhance the human experience is reflected in my diverse interests, which include **embedded systems, game development, and AR/VR/XR**. 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.

PROFESSIONAL EXPERIENCE

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

Student Volunteer, Aug 2021 – present
Center of Excellence in Visual Intelligence, KLE Technological University Hubballi, India
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.

EDUCATION

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

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][Under revision] introduced a new variant of KNN that is topology and density aware, and applied it to develop a novel methodology for upsampling and denoising 3D point clouds. This approach considers the topology of the data for better representation and recovery of missing information.
Tools used: Python, PyTorch, PyTorch3D, Open3D

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

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

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

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

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

Uma Mudenagudi,
Director, Center of Excellence in Visual Intelligence, KLE Technological University | Dean R&D, KLE Technological University | Professor, SoECE, KLE Technological University
uma@kletech.ac.in, 9343392667

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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DECLARATION

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