VISION CRAFT

Presented By : Shubham

DESCON

ABSTRACT

The winter project, organized by the DESCON Club, aimed to provide hands-on experience with ‘OpenCV,’ a powerful tool for image manipulation. The primary objective was to learn how to extract frames from a video and use them to generate a 3D mesh of the recorded object.

OVERVIEW

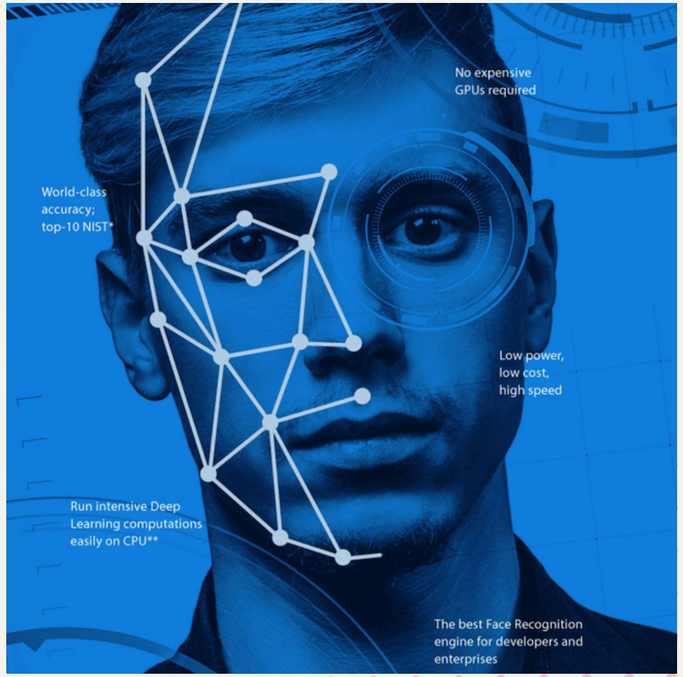
- Week 1 - Basic Python and libraries + Git
- Week 2 - openCV
- Week 3 - Feature detection and contours
- Week 4 - Mesh creation

WEEK - 1

During the first week, we focused on learning Python and key libraries such as NumPy and Pandas. NumPy is essential for efficient array management, while Pandas is widely used for handling and analyzing data through dataframes.

WEEK - 2

During the second week, we explored OpenCV, a crucial Python library widely used for image processing and manipulation. Our primary focus was on extracting frames from a given video and applying filters to those frames for further processing.



WEEK - 3

During the third week, we focused on edge and contour detection, a key aspect of OpenCV. This was applied in our project for filtering the extracted frames. We explored multiple techniques for detection, including Canny edge detection, thresholding, and the findContour method.

WEEK - 4

During the final week, we combined all the skills we had acquired to create a 3D mesh from a video of an object. Additionally, we learned how to use Meshroom, a powerful tool for 3D reconstruction and an essential part of the object creation process.

MY LEARNINGS

1. A significant part of this project involved Python, which I thoroughly enjoyed learning. Additionally, we worked with Git, an essential tool for version control and collaboration throughout the project.

2. Python libraries such as Pandas, NumPy, Matplotlib, and OpenCV played a crucial role in the successful completion of this project by simplifying data handling, visualization, and image processing tasks.

3. Last but not least, the final stage of mesh creation was incredibly exciting and a rewarding experience, as it brought together everything we had learned throughout the project.

EXTRAS

Face detection

Eyes detection

Face detection and eye detection using OpenCV were key components of our learning process, though not included in the final project. We also explored face detection for a specific person, which provided valuable insights into advanced image processing techniques.

Image manipulation

During the second week, we learned various operations that can be applied to images, enhancing our understanding of image manipulation techniques using OpenCV.

Contours

We dedicated an entire week to exploring contours and edges, along with various related operations, to deepen our understanding of these essential image processing techniques in OpenCV.

THANK YOU

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