

Introduction

tackles the challenge of creating high-quality panoramas from video footage and addresses the limitations of traditional cameras. This project automates the transformation of video frames into seamless panoramic images using advanced computer vision techniques. By extracting, enhancing, and stitching video frames.

Algorithm Flow

Frame Extraction

Extract frames from the video at regular intervals to capture the entire scene

Image Enhancement

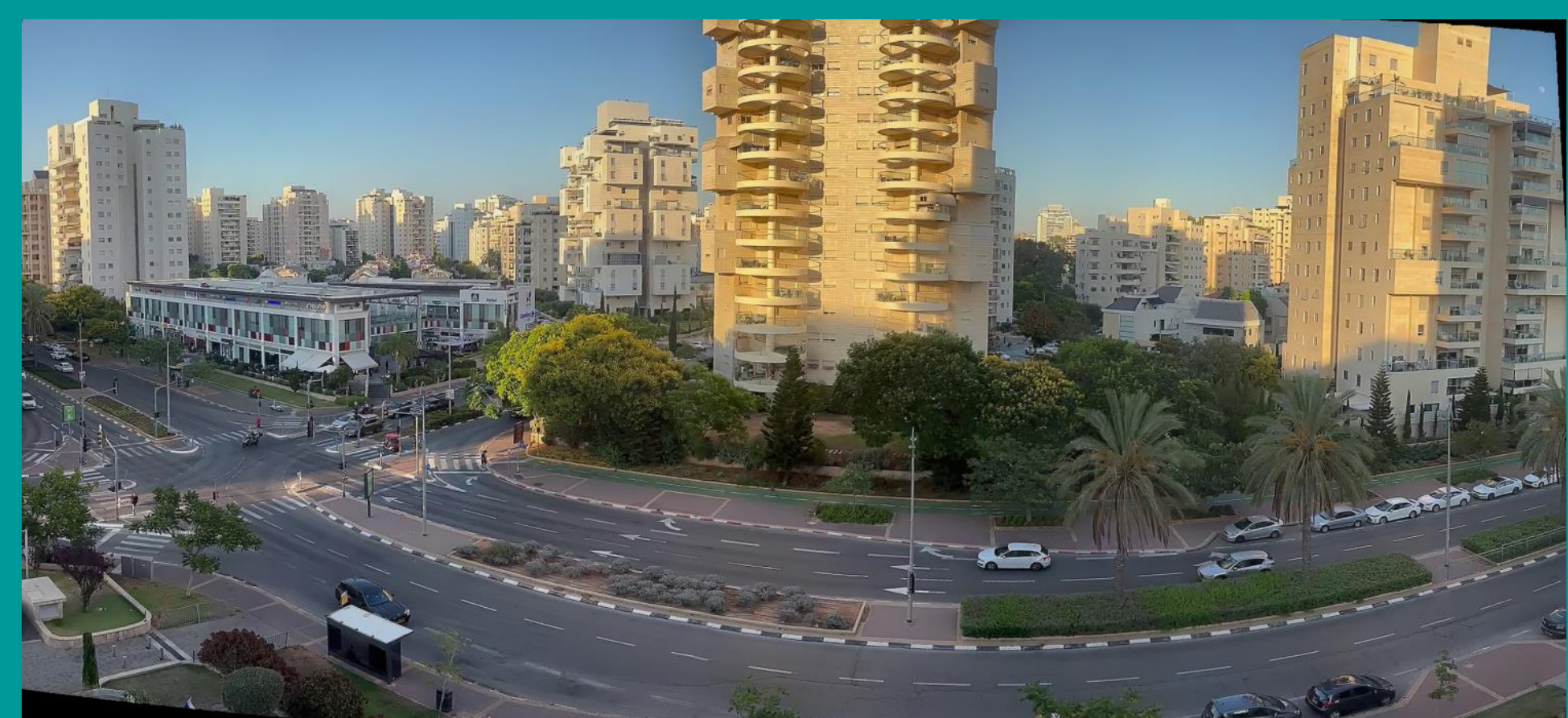
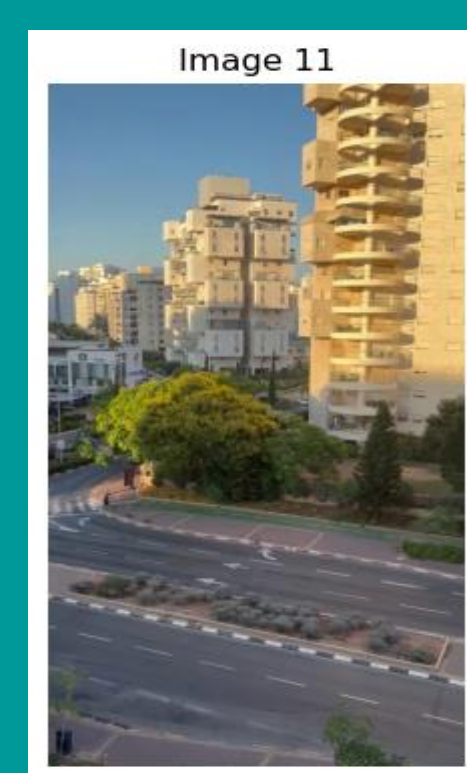
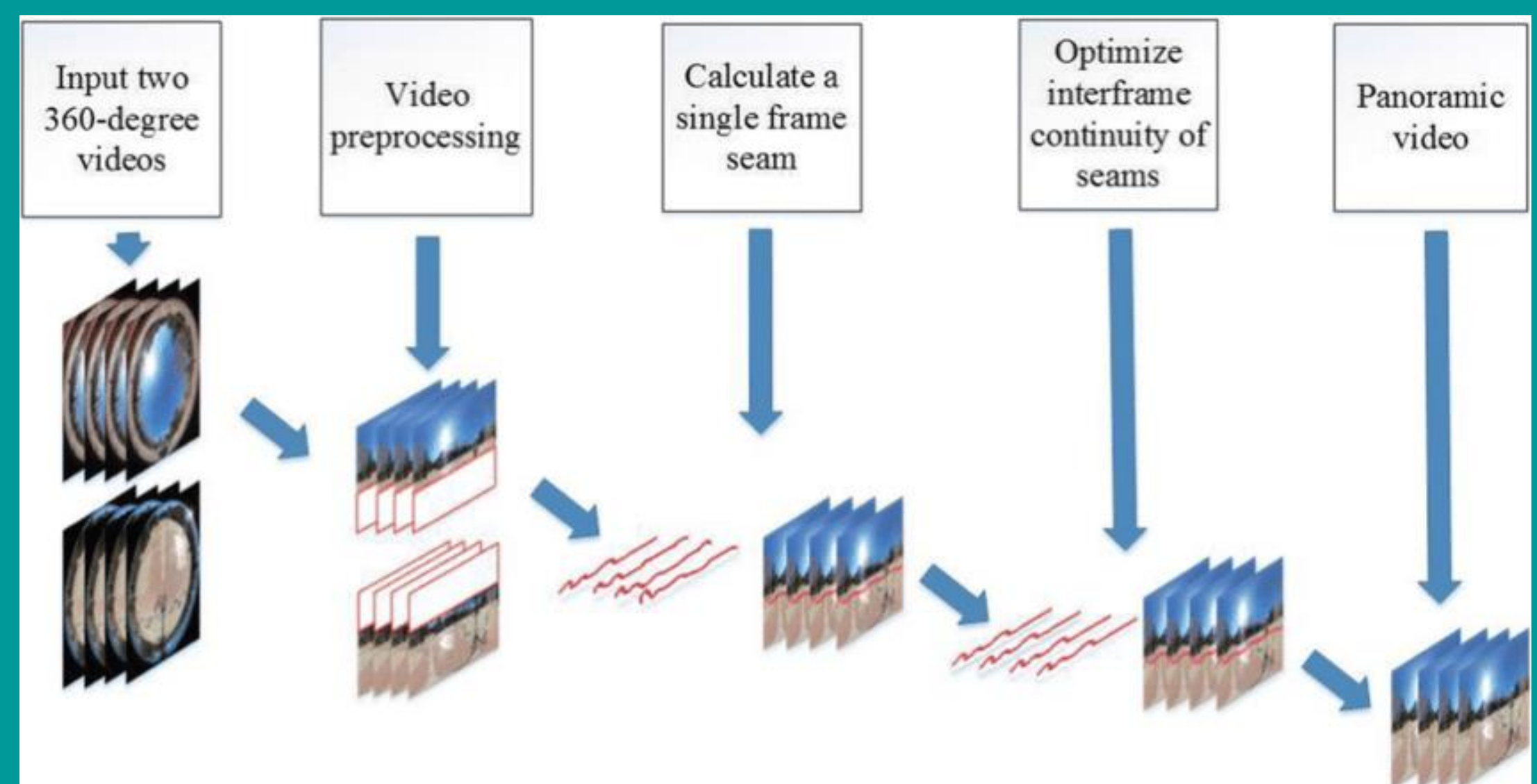
Enhance each frame to improve clarity and detail using sharpening techniques.

Image Stitching

- Use feature detection (SIFT) to identify key points in overlapping frames.
- Match features between frames and compute homographies to align them.
- Warp and blend frames together to create a seamless panorama.

Cropping

Crop the resulting panorama to remove black borders and ensure a clean final image.



Main Algorithm – Stitcher Create

this function in OpenCV simplifies the process of creating panoramic images by automating several complex steps:

Initialization - Initializes a Stitcher object.

Feature Detection - Detects key points and descriptors in the images.

Feature Matching - Matches features between overlapping images.

Homography Estimation - Computes transformations to align images.

Image Warping - Warps images to align overlapping regions.

Image Blending - Blends images to create a seamless panorama.

Future Upgrades

- Implementation of deep learning models, for example:

GAN (Generative Adversarial Networks)

To improve the quality of the image, remove noise and improve the sharpness of the frames.

- Video stabilization: adding a video stabilization step before producing the frames to avoid displacements and vibrations in the final image.

- Creating a more accurate final image cutting method.

