

motion, flow of optics and motion vector

Assignment

1. Define motion estimation in computer vision and discuss its importance in various applications

Motion estimation is the process of determining the motion of objects or pixels between two frames of a video. It's crucial for applications such as object tracking, video compression, and 3D scene reconstruction.

2. Discuss the challenges faced in motion estimation, particularly in the presence of occlusions and complex scene dynamics. Propose potential solutions to address these challenges

Challenges include occlusions, where parts of the scene are hidden, and complex dynamics, like non-rigid motion. Solutions involve using advanced models like optical flow, deep learning, and robust algorithms that handle outliers and occlusions effectively.

3. Explain the concept of optical flow and its role in motion estimation.

Discuss common optical flow algorithms and their applications

Optical flow is the pattern of apparent motion of objects between two consecutive frames caused by the movement of the object or camera.

Algorithms like the Horn-Schunck and Lucas-Kanade methods are commonly used for tracking motion in video and image stabilization.

4. Define optical flow and explain its significance in computer vision applications

Optical flow refers to the motion of pixels in an image sequence. It is significant for tasks like object tracking, video stabilization, and scene reconstruction, providing valuable motion information from consecutive frames.

5. Describe the concept of motion vectors in video compression and discuss their role in reducing redundancy

Motion vectors represent the displacement of blocks of pixels between consecutive video frames. They are used in video compression to exploit temporal redundancy, reducing the amount of data required to store video sequences.