Kanade-Lucas-Tomasi (KLT) Tracking

Theory

The Kanade-Lucas-Tomasi (KLT) tracker is an optical flow algorithm for tracking features across video frames. KLT uses the Lucas-Kanade method, assuming brightness constancy and small motion between frames. It detects keypoints (e.g., corners) using Shi-Tomasi corner detection and tracks them by solving for motion vectors in a local neighborhood. In human monitoring, KLT tracks features on moving individuals, such as body parts or clothing, for applications like motion analysis. It is fast and effective for short-term tracking but may fail with large motions or occlusions.

Applications in Human Monitoring

- **Person Tracking**: Tracks individuals in surveillance videos for security.
- **Motion Analysis**: Estimates human movement for behavior studies.
- **Crowd Monitoring**: Tracks multiple people in crowded scenes.

Implementation Notes

- The `klt.py` script uses OpenCV's `calcOpticalFlowPyrLK` for tracking Shi-Tomasi corners.
- **Input**: Video or webcam feed.
- **Output**: Tracked points with motion trails, displayed in an OpenCV window.
- **Recommended dataset**: MOT16 dataset for testing tracking performance.