Canny Edge Detection

Theory

Canny edge detection is an algorithm for identifying edges in images, critical for outlining objects like humans. It applies Gaussian blur to reduce noise, computes gradient intensity and direction, uses non-maximum suppression to thin edges, and applies double thresholding to determine strong and weak edges. Hysteresis links weak edges to strong ones, ensuring robust edge detection. In human monitoring, Canny is used to detect silhouettes or boundaries of individuals, aiding in segmentation or tracking. It is sensitive to noise and requires parameter tuning for optimal performance.

Applications in Human Monitoring

- **Silhouette Detection**: Outlines humans in surveillance footage for segmentation.
- **Motion Analysis**: Detects edge changes to infer movement in videos.
- **Preprocessing**: Provides edge maps for further processing, like HOG detection.

Implementation Notes

- The `canny.py` script uses OpenCV's `Canny` function with predefined thresholds.
- **Input**: Image, video, or webcam feed.
- **Output**: Edge map displayed in an OpenCV window.
- **Recommended dataset**: INRIA Person Dataset for testing edge detection on humans.