Probabilistic Multi-Object Tracking with Bayesian Networks

A probabilistic object tracking system using Bayesian Networks to track pedestrians and cyclists across video frames.

Overview

The system uses a Bayesian Network that considers four key features:

- **Position**: Spatial proximity between detections
- **Size**: Bounding box area similarity
- **Color**: Histogram-based comparison using OpenCV
- **Velocity**: Movement patterns and direction consistency

Note: Bayesian temporal connections between frames are not fully implemented. Each frame is processed independently.

Usage

```
python main.py <data_folder>
```

For debug mode with visual display, modify `main.py`:

```
main(debug=True)
```

Input Format

- `data_folder/bboxes.txt`: Detection file
- `data_folder/frames/`: Frame images directory

Output

Space-separated IDs for each frame:

- `0, 1, 2, ...`: Continuing tracks (detection index)
- `-1`: New detections

Detailed documentation in Polish: data/README.md