Person Re-Identification Using CCTV Footage

Objective: The objective of this assignment is to assess your computer vision skills in person re-identification using publicly available CCTV footage. You will develop a model to identify and track individuals across multiple camera views.

Requirements: You will need access to a dataset of publicly available CCTV footage (e.g., from YouTube, academic datasets, or other free sources). Use Python and popular computer vision libraries like OpenCV and PyTorch.

Instructions:

Step 1: Data Collection and Preprocessing (10 points)

1. Collect a dataset of publicly available CCTV footage that includes multiple camera views capturing people walking.
2. Preprocess the video data into a format suitable for model training.
3. Document the data collection and preprocessing process in your README.md file.

Step 2: Person Detection and Tracking (20 points)

1. Implement person detection using a pre-trained object detection model (e.g., YOLO, Faster R-CNN).
2. Develop a tracking algorithm to track individuals across frames and camera views.
3. Document the detection and tracking process in your README.md file.

Step 3: Feature Extraction (15 points)

1. Extract relevant features from detected and tracked individuals.
2. Choose appropriate feature extraction methods (e.g., CNN embeddings, color histograms).
3. Document the feature extraction process in your README.md file.

Step 4: Person Re-Identification Model (20 points)

1. Design and implement a person re-identification model using PyTorch.
2. Train the model on your dataset, using the extracted features.
3. Evaluate the model's performance on person re-identification tasks.
4. Document the model architecture, training process, and evaluation results in your README.md file.

Step 5: Visualization and Demonstration (10 points)

1. Create visualizations that showcase the effectiveness of your person re-identification model.
2. Demonstrate how the model can accurately re-identify individuals across different camera views.
3. Document the visualization and demonstration in your README.md file.

Step 6: Final Submission (5 points)

1. Ensure that your GitHub repository is well-organized and contains all necessary documentation.
2. Submit the link to your GitHub repository to your instructor/evaluator for evaluation.