

Weekly Report – Week 4

Project Name: Person Re-identification

Course Name: CSE623 Machine Learning Theory and Practice

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Team Members:

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Summary of Work Done This Week:

METHODOLOGY DEVELOPMENT AND BASELINE EXPERIMENTS

Goals:

Develop an end-to-end ReID pipeline that will use traditional feature extraction methods. Conduct baseline experiments on the Kaggle Person ReID dataset as a controlled environment. Implement dimensionality reduction methods using PCA and classification methods using K-Nearest Neighbors (KNN).

What We completed:

Pipeline development:

Designed a workflow that consists of resizing and converting the images, extracting features using HOG, SIFT and color histograms, and then hybridizing features, where necessary.

Dimensionality reduction:

Used Incremental PCA to reduce features (tests with `n_components` = 100, 200, and 400), to help make the computations more manageable.

Baseline experiments on Kaggle dataset:

Executed stratified split of the dataset at 80/20. Trained a variety of configurations of KNN (using Euclidean and cosine similarity), and tuned different numbers of neighbors (K values like 3, 5, and 9) as inputs. Found fit and promising cross-validation accuracies (up to 0.9703 with colour based features) as well as good Rank-1 accuracy (0.974 with HOG and cosine similarity).

Challenges:

Making sure the dimensionality reduction process does not alter too much discriminative information. Developing KNN classifiers can be successfully tuned to properly deal with the high-dimensional feature space.