Joint Noise-Tolerant Learning and Meta Camera Shift Adaptation for Unsupervised Person Re-identification

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**Problem Definition**

- **Challenge**: Noisy label optimization (1) Noisy-tolerant Optimization (2) Overcome camera-shift.
- **Solution**: Dynamic & Symmetric Cross-Entropy Loss (DSCE).

**Viewpoint Changes**

1. **Initial State**: t-SNE plot of 10 persons under different settings (model trained w/o MetaCam and model trained w/ MetaCam).
2. **With MetaCam**: Use different colors to denote identities and different shapes to indicate camera IDs. The algorithm with MetaCam generates intra-class features that are close to each other, indicating that our MetaCam can guide the model to learn camera-invariant features.

**Solutions**

- **(1) Dynamic & Symmetric Cross-Entropy Loss (DSCE)**.
- **(2) Camera-aware meta-learning**.

**Motivation**: Optimizing (Generalizing) models with unlabeled data.

**Challenges & Solutions**

- **Goal**: (1) Noisy-tolerant Optimization (2) Overcome camera-shift.
- **Challenges**: (1) Changing identities during clustering prevents the utilization of theories about noisy label learning like [3]. (2) Re-ID models are supposed to be camera-invariant, which is hard to achieve due to large intra-class variation brought by camera-shift problem.
- **Solutions**: (1) Dynamic & Symmetric Cross-Entropy Loss (DSCE). (2) Camera-aware meta-learning.

**General Idea**

1. Loss functions should satisfy “symmetric constraint” [3] to become noise-tolerant. To accommodate to changing IDs, we adopt memory bank. (2) A good unsupervised re-ID model should not only discern the pedestrians from seen cameras, but also samples in unseen cameras. This idea can be achieved through camera-aware meta-learning.

**Framework**

- **Model**: Meta-ID. 
- **Finetune**: (a) Fully Unsupervised [1] (b) Domain Adaptation [2]
- **Initial State**: Labeled Data + Unlabeled Data

**Motivation**: Optimizing (Generalizing) models with unlabeled data.

**Contact Us**

If you have any problem, please send email to us (yangfx@stu.xmu.edu.cn) or ask in Github.

Scan the right QR code for code and other resources.

**References**