

# A Comparative Study of Various Person Re-Identification in Videos

Danvir Mandal

Lovely Professional University, Punjab

## Abstract

The various techniques for person re-identification in videos have been discussed and presented in this work. Many techniques like re-identification using neuromorphic criteria, deep metric learning with pose invariant case, transformation based on relaxation of label space, networks using multi-cameras, hybrid representation reinforced, bag of words model and log density gradient clustering are reviewed and illustrated in brief. This study can be used to further improve the existing techniques for person re-identification.

*Keywords: Person re-identification, video, comparative study*

## 1. Introduction

The scholars and researchers, in the past years, have intensively explored the area of person re-identification in videos using various techniques [1-7]. In [1], a scheme which was based on clustering of log-density gradients had been proposed and illustrated in for image to video. A method which employed bag of words, which is improved, for the re-identification of person, had been illustrated and presented in [2]. In [3] and [6], metric learning had been utilized for person re-identification. In [4], person re-identification in smart cities for multiple cameras was employed and proposed. The scheme in [5] for person reidentification was implemented using transformation based on label space. In [7], re-identification was implemented using neuromorphic approach.

The various techniques reviewed in this studied has been organised in following sections. Section 1 is the introduction. All the techniques reviewed are discussed in section 2. The review work on person re-identification is concluded in last section.

## 2. Techniques for Person Re-identification in Videos

Various methods that had been included in this review work are mentioned as follows:

### (a) Clustering Based Scheme

In [1], clustering of log-density gradient which was based on salient region has been implemented for person re-identification.

### (b) Based on Bag of Words

A novel method based on bag of words, which is improved, was illustrated, and proposed to re-identify person in videos [2]. This scheme was based on learning, which is unsupervised in nature. Further authors suggested to use deep learning methods as future work in [2].

(c) *Metric Learning Based Approach*

In [3] and [6], a technique which is based on metric learning was proposed and presented. In The scheme in [3] was using representation in hybrid manner for the said purpose of person re-identification. Another technique which was based in metric learning used pose invariant scheme [6].

(d) *Other Techniques*

In [4], [5] and [7], different methods are proposed and presented for person re-identification. A novel scheme for re-identification of persons using multiple cameras had been illustrated and discussed in [4]. In [5], a method based on transformation, which is for label space, and used with learning for semi-coupled dictionary was implemented and results were presented. Another scheme based on method which used neuromorphic criteria had been proposed and illustrated in [7].

## Conclusion

In this paperwork, study of different schemes for re-identification of persons in videos have been reviewed, discussed, and presented in brief. The re-identification based on clustering, bag of words, metric learning and other techniques using multiple cameras, transformation and neuromorphic criteria are illustrated in brief. This study presented the existing techniques in brief and further rigorous and detailed review of the methods that had been used for the re-identification of person in videos can be performed as a future scope.

## References

- [1]. T. Li, L. Sun, C. Han and J. Guo, "Salient Region-Based Least-Squares Log-Density Gradient Clustering for Image-To-Video Person Re-Identification," in *IEEE Access*, vol. 6, pp. 8638-8648, 2018, doi: 10.1109/ACCESS.2018.2790969.
- [2]. L. Tian and S. Wang, "Improved bag-of-words model for person re-identification," in *Tsinghua Science and Technology*, vol. 23, no. 2, pp. 145-156, April 2018, doi: 10.26599/TST.2018.9010060.
- [3]. N. Perwaiz, M. M. Fraz and M. Shahzad, "Person Re-Identification Using Hybrid Representation Reinforced by Metric Learning," in *IEEE Access*, vol. 6, pp. 77334-77349, 2018, doi: 10.1109/ACCESS.2018.2882254.
- [4]. S. Zhang and H. Yu, "Person Re-Identification by Multi-Camera Networks for Internet of Things in Smart Cities," in *IEEE Access*, vol. 6, pp. 76111-76117, 2018, doi: 10.1109/ACCESS.2018.2883560.
- [5]. L. Sun, Z. Jiang, H. Song, Q. Lu and A. Men, "Semi-Coupled Dictionary Learning With Relaxation Label Space Transformation for Video-Based Person Re-Identification," in *IEEE Access*, vol. 6, pp. 12587-12597, 2018, doi: 10.1109/ACCESS.2018.2803789.
- [6]. M. Chen, Y. Ge, X. Feng, C. Xu and D. Yang, "Person Re-Identification by Pose Invariant Deep Metric Learning with Improved Triplet Loss," in *IEEE Access*, vol. 6, pp. 68089-68095, 2018, doi: 10.1109/ACCESS.2018.2879490.
- [7]. A. Nanda, P. K. Sa, S. K. Choudhury, S. Bakshi and B. Majhi, "A Neuromorphic Person Re-Identification Framework for Video Surveillance," in *IEEE Access*, vol. 5, pp. 6471-6482, 2017, doi: 10.1109/ACCESS.2017.2686438.