An Efficient Deep Learning-Assisted Person Re-Identification Solution for Intelligent Video Surveillance in Smart Cities

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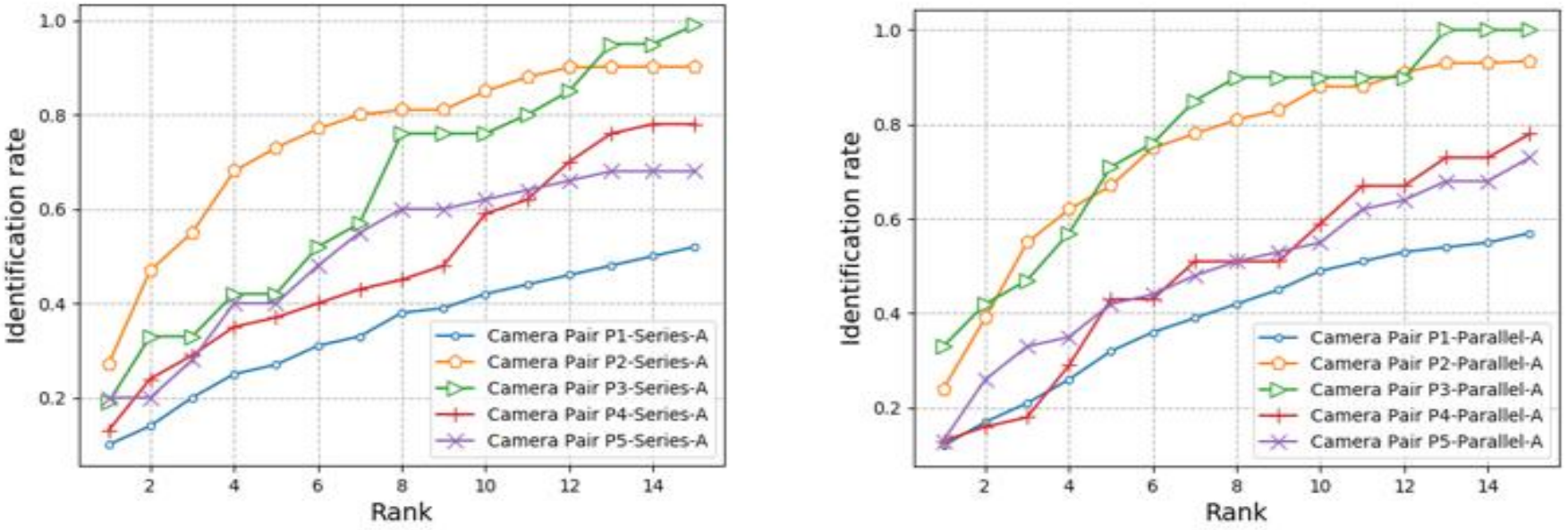
Problems & Ideas

- Problems with manual crime prevention measures in smart cities:
  - Common techniques include automated vision-based smart surveillance systems based on person re-identification
  - Deep learning algorithms, which are one of the most effective in Artificial Intelligence, can be used for person reindentification
  - Diverse environments, such as uncertainty in visual appearance owing to postures, lighting conditions, scene occlusions, background noise, and camera viewpoints pose a significant problem to these algorithms
- Ideas: A deep learning strategy that models feature inter-spatial and inter-channel relationships to strengthen the representation of significant regions of interest in images is taken into account

Images of the same people taken from different camera viewpoints. The variation in visual appearance is fairly noticeable.

Main Contributions

- Contributions:
  - An end-to-end holistic adaptive feature refinement-based deep learning model is proposed for effective person Re-ID in smart cities for surveillance purposes.
  - Deep learning model uses feature inter-spatial and inter-channel relationships to acquire the attention maps to enhance the representation of relevant regions of interest as well as lowering the extracted feature values of irrelevant areas
  - Extensive spatial information is exploited during feature extraction using SPP layers.



Rank 1- to Rank-15 CMC curves with single gallery shot setting of different camera viewpoints . Left: Configuration of adaptive refinement in series; Right: Configuration of adaptive refinement in parallel