HPC Feature for Crowd Outdoor Scenes Estimation

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Crowd people estimation in outdoor scenes is a difficult task and an important research area in the computer vision of person monitoring security fields. The effectiveness of feature is very crucial for this estimation. Although the existing works system got the suitable result, but have not worked well due to the weakness of their feature detector. Only the histogram gradient feature, or principal component feature can't perfectly represent for all locations of the crowd people area. So, effective feature detection plays an important factor in the crowd estimation system. To cover these factors, this work proposes the hybrid HPC feature (processed as a cascaded feature) to establish the crowd people estimation system in order to predict the accurate people number. To get the HPC cascaded feature, histogram of gradient (H) feature, principal component analysis (P) feature and convolutional neural network (C) feature is used as the step by step procedure. Although three feature detectors are used as a cascaded, this work gets the less time complexity. Convolutional neural network applies as the classifier to estimate the system result. The experimental performance is evaluated on PET 2009 and UCSD crowd datasets and this work gets the significant and lowest error rate.