Holcombe Department of Electrical and Computer Engineering Lecturer Presentation

Multi-feature fusion for efficient human detection

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Abstract

Detection of human beings in a complex background environment is a great challenge in the area of computer vision. For such a difficult task, most of the time no single feature algorithm is rich enough to capture all the relevant information available in the image. To improve the detection accuracy, we proposed a descriptor that fuses the local phase information, image gradient, and texture features as a single descriptor and is denoted as fused phase, gradient and texture features (FPGT). The gradient and the phase congruency concepts are used to capture the shape features, and a center-symmetric local binary pattern (CSLBP) approach is used to capture the texture of the image. The fusing of these complementary features yields the ability to localize a broad range of the human structural information and different appearance details which allow to more robust and better detection performance. The proposed descriptor is formed by computing the phase congruency, the gradient, and the CSLBP value of each pixel with respect to its neighborhood. The histogram of oriented phase and histogram of oriented gradient, in addition to CSLBP histogram are extracted for each local region. These histograms are concatenated to construct the FPGT descriptor. Several experiments were conducted to evaluate the detection performance of the proposed descriptor. A support vector machine (SVM) classifier is used in these experiments to classify the FPGT features. The results show that the proposed algorithm has better detection performance in comparison with the state of art feature extraction methodologies.

Biography of Speaker

Hussin Ragb received his BS from the Electrical and Electronic Engineering department at University of Tripoli (1991). Since then he worked in the technical research and development center in Libya. His work has been focused on the development of the laser-based systems. In 2000, He received his MS degree from the Electrical and Computer Engineering department at the University of Belgrade. Since then he worked as lecturer at University of Tripoli. In 2018, he earned his PhD degree from the Electrical and Computer Engineering department at University of Dayton. Currently he is adjunct faculty in both the ECE and the Computer Science departments at the University of Dayton.