

Adversarial Disentanglement Using Latent Classifier for Pose-Independent Representation

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Abstract : The large pose discrepancy is one of the critical challenges in face recognition during video surveillance. Due to the entanglement of pose attributes with identity information, the conventional approaches for pose-independent representation lack in providing quality results in recognizing largely posed faces. In this paper, we propose a practical approach to disentangle the pose attribute from the identity information followed by synthesis of a face using a classifier network in latent space. The proposed approach employs a modified generative adversarial network framework consisting of an encoder-decoder structure embedded with a classifier in manifold space for carrying out factorization on the latent encoding. It can be further generalized to other face and non-face attributes for real-life video frames containing faces with significant attribute variations. Experimental results and comparison with state of the art in the field prove that the learned representation of the proposed approach synthesizes more compelling perceptual images through a combination of adversarial and classification losses.

Keywords : disentanglement, face detection, generative adversarial networks, video surveillance

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