Paper Review

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1 Supervised Descent Method and Its Application to Face Alignment (Xiong, Torre)

This paper provides an alternative to Newton's method for optimization. Newton's method requires the objective function to be twice differentiable which is often not possible in dealing with things like SIFT operators. For the Non-linear least squares problem (NLS), they propose that the "descent direction" term be expressed as a linear combination of feature vectors and a bias term and can be learnt from training data. They claim the error monotonically decreases as number of regressors are added and algorithm converged in 4 or 5 steps in their experiments. More specifically, they apply this technique to the problem of image alignment. They claim to outperform the state-of-the-art on challenging datasets: LFPW, LFW-AC, RU-FACS and Youtube celebrities.