Recent Result for Deep learning based Image processing in IVY Lab (2015)

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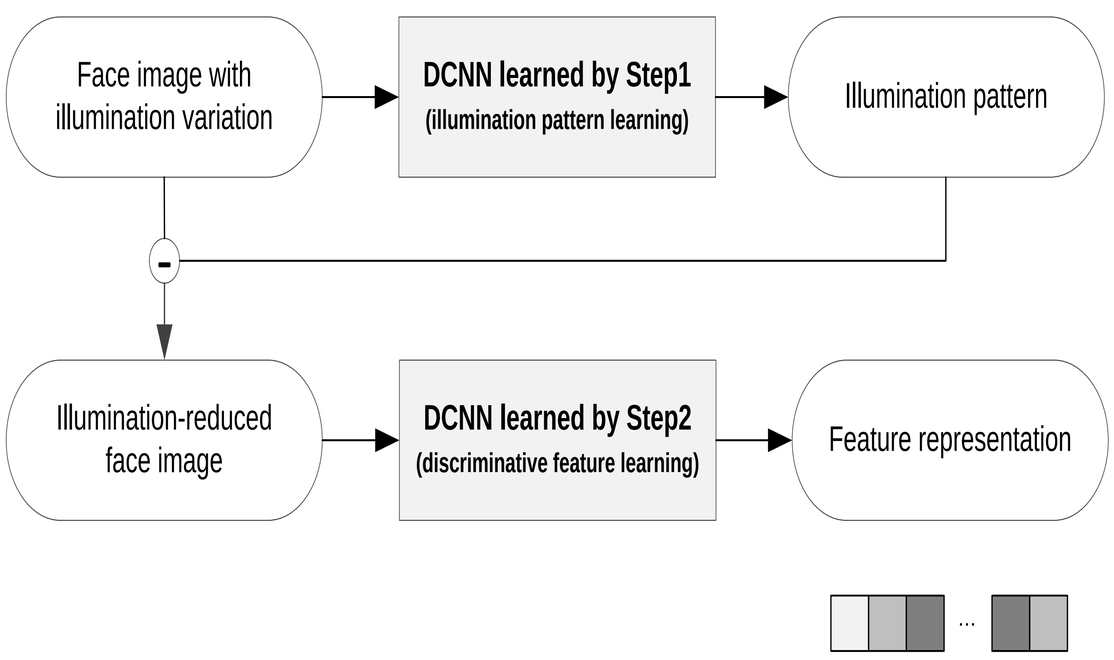
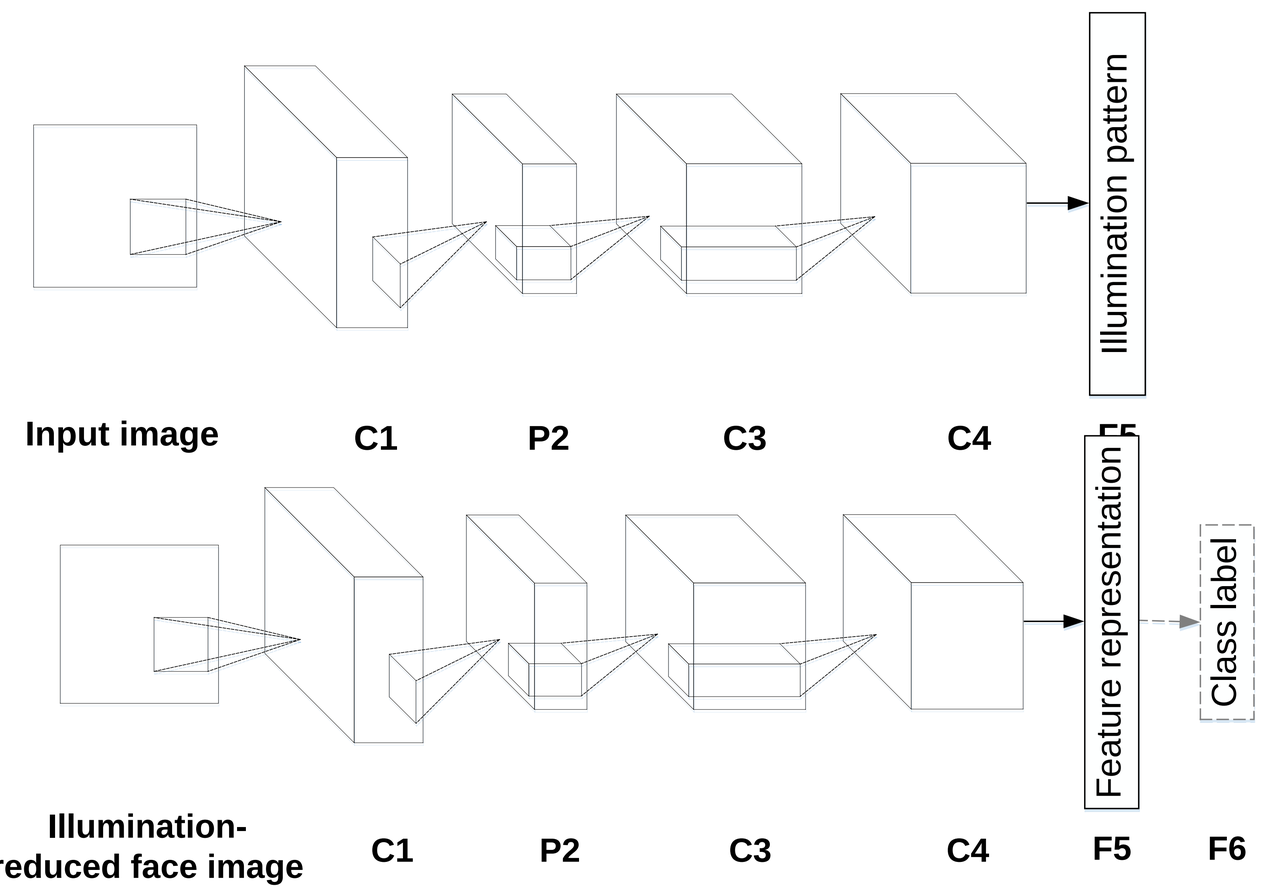
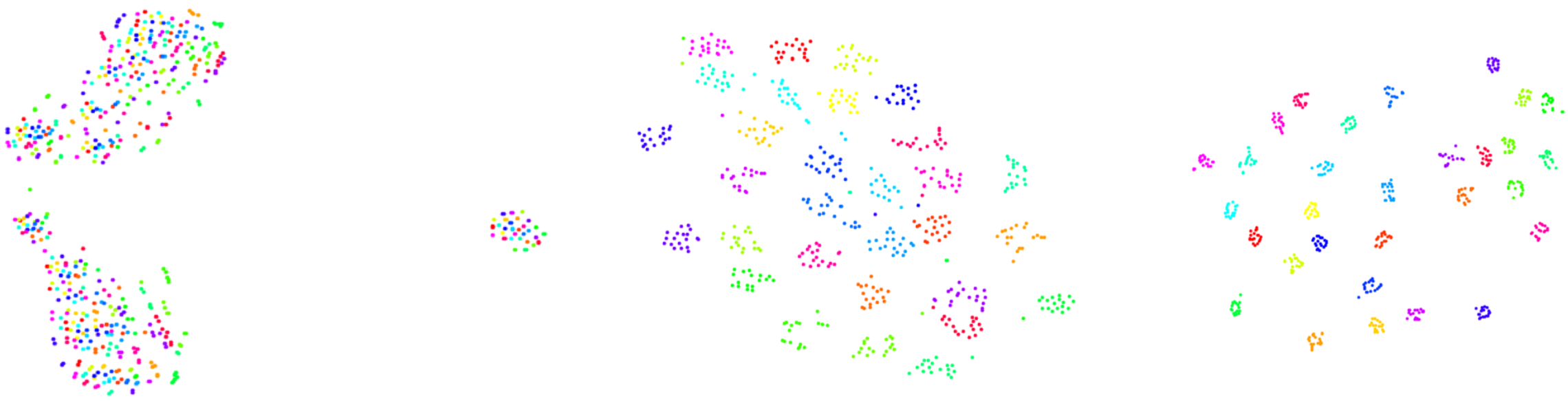
Two-step Learning of Deep Convolutional Neural Network for Discriminative Face Recognition under Varying Illumination





FR method robust to illumination variations learned with the proposed two-step learning method.

DCNN architectures adopted in the proposed learning method. (a) DCNN for learning illumination patterns. (b) DCNN for maximizing the discriminative power of feature representation.



(a) Original 2D feature space under illumination variations.

(b) 2D feature space learned with the proposed method (after Step 1).

(c) 2D feature space learned with the proposed method (after Step 2).

Visualization of 2D feature spaces. Each dot represents a feature from 30 different classes under 20 illumination variations. (Best viewed in color.)

Table 1. FR accuracy comparisons with the proposed method and the previous works.

Method	Recognition rate
Histogram equalization [5]	43.10%
Multi-scale retinex [7]	60.55%
GradientFace [8]	84.75%
Weber-Face [9]	90.47%
Conventional CNN [18]	72.22%
Proposed method	96.24%