Deep Facial Diagnosis 2
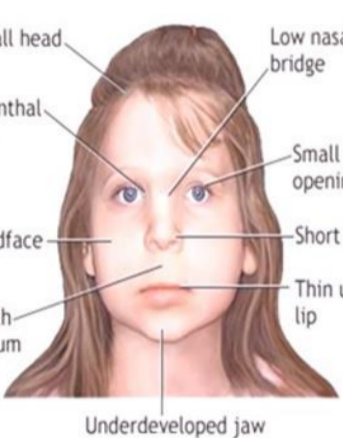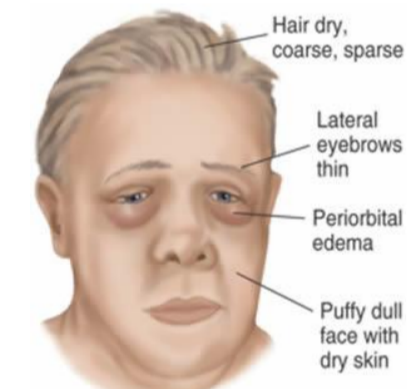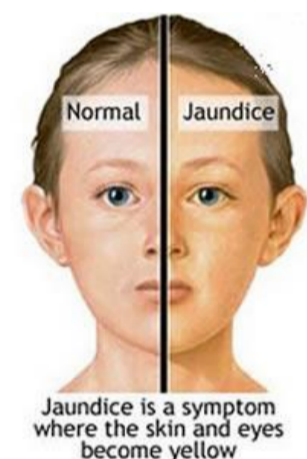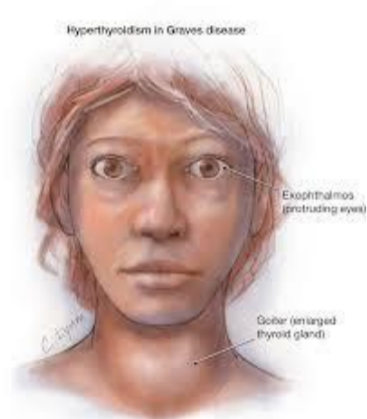
Jin Bo

Qi and blood in the twelve Channels and three hundred and sixty-five Collaterals all flow to the face and infuse into the Kongqiao (the seven orifices on the face).
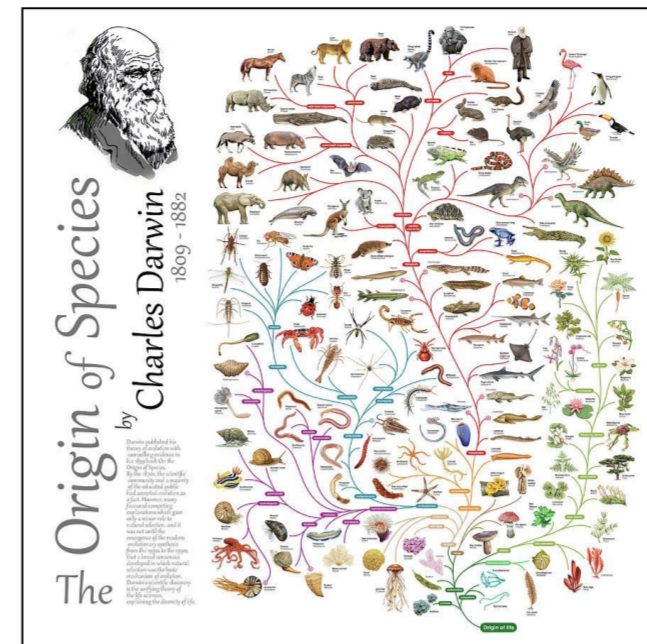
------ *Huang Di Nei Jing Su Wen*

Natural selection is the process through which species adapt to their environments. It is the engine that drives evolution.

------ *On the Origin of Species*

Deep Facial Diagnosis 1
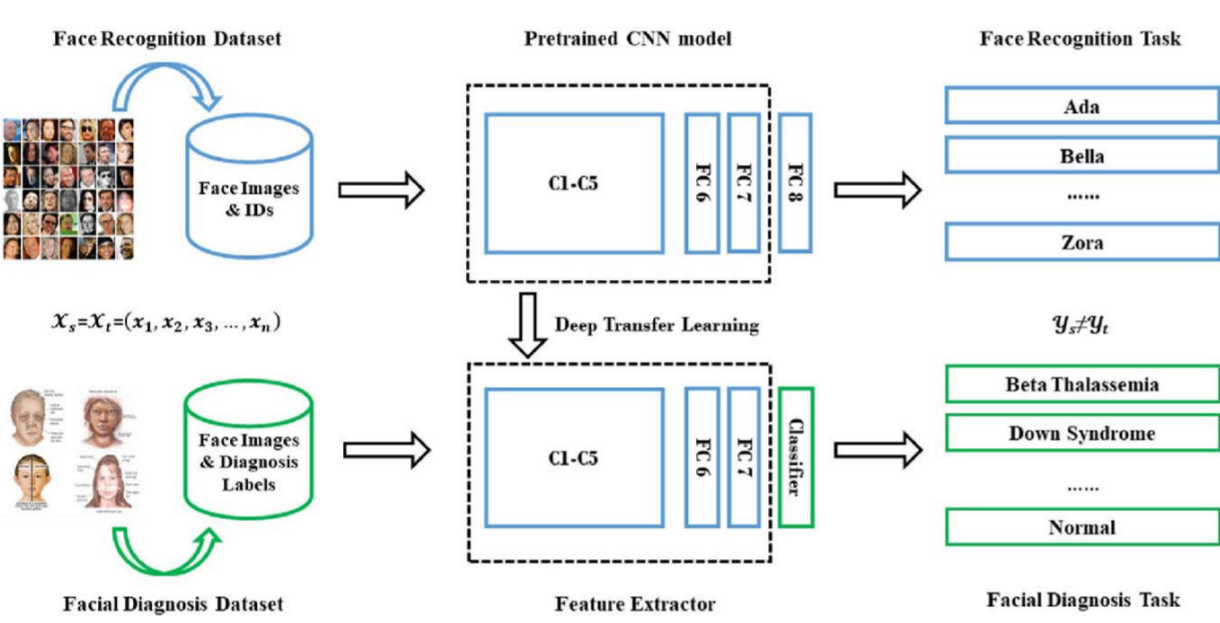
DTL 2 CNN as a feature extractor
Input: training dataset $D = \{(\mathbf{x}_k, \mathbf{y}_k)\}_{k=1}^{m}$,
         pretrained CNN model,
         penalty factor C
Output: adapted linear SVM model
     function $DTL2(D, CNN, C)$
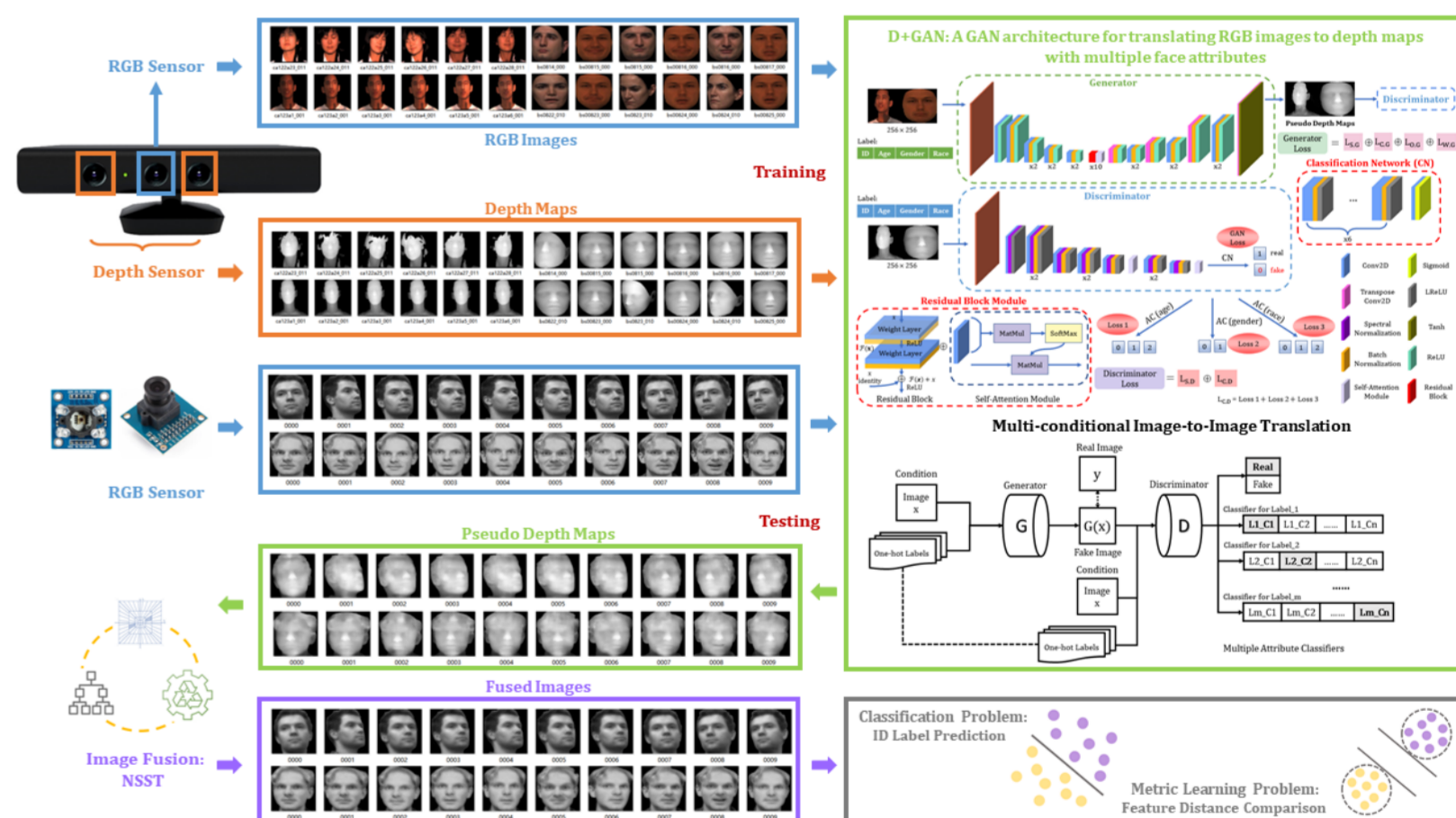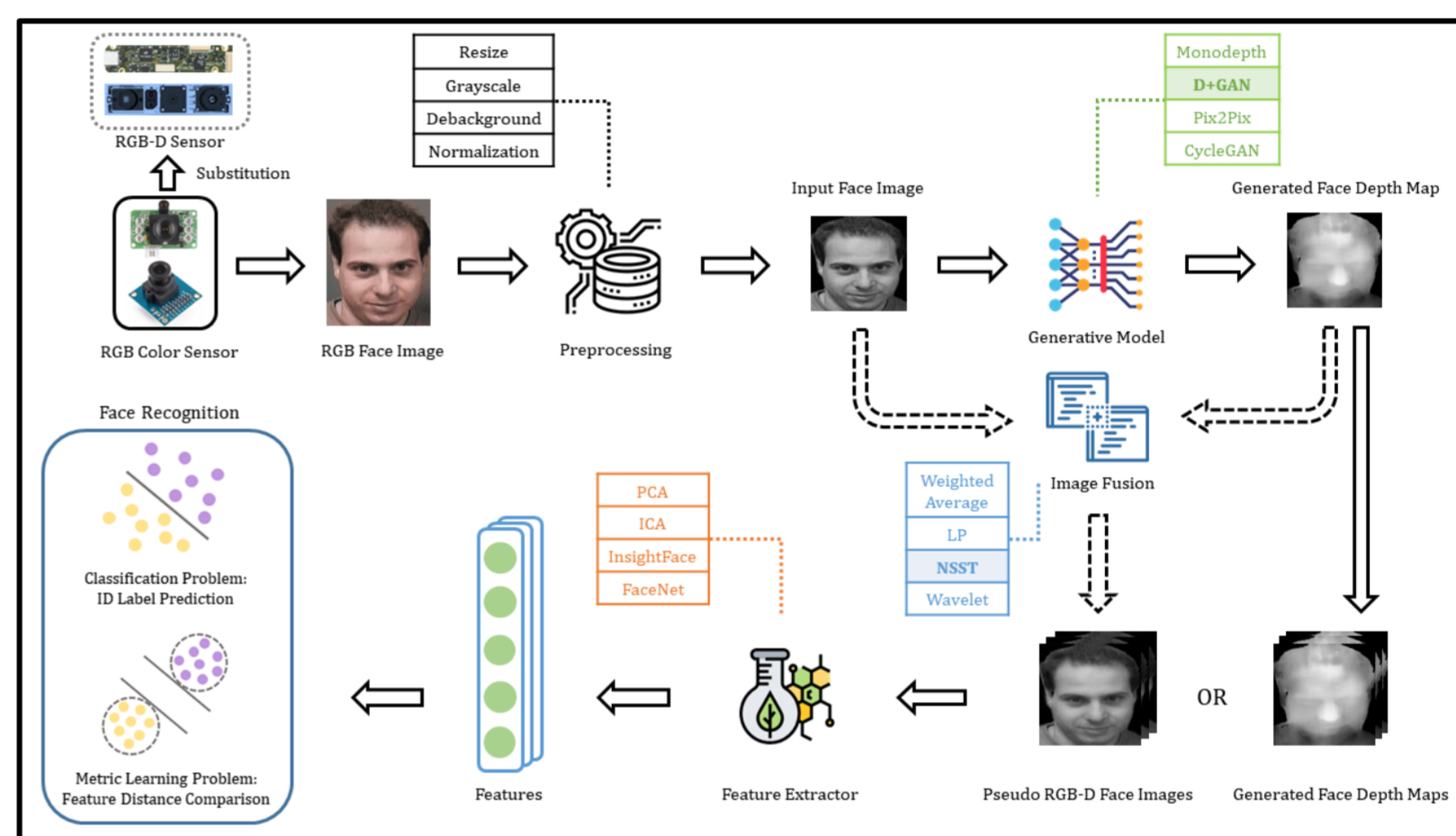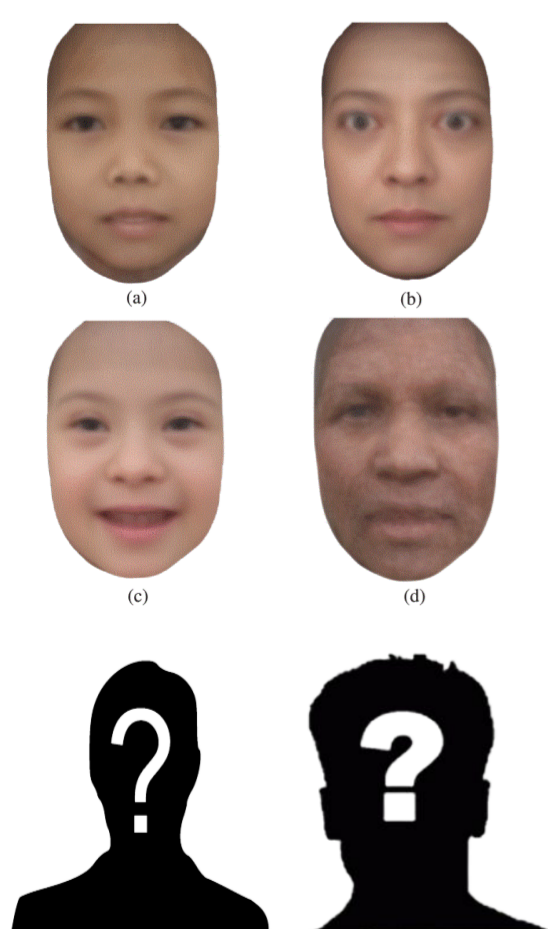 $parameters \leftarrow load\_model(CNN, pretrained=true)$
         for all $(\mathbf{x}_k, \mathbf{y}_k) \in D$ do
             $vectors \leftarrow model\_predict(x_k, parameters)$
             $labels \leftarrow y_k$
             $features \leftarrow get\_feature(vectors, layer=FC)$
         end for
         $kernel \leftarrow function\ K(f_i, f_j) = f_i^T f_j$
         $solver \leftarrow Sequential\ Minimal\ Optimization(SMO)$
         $options \leftarrow kernel, solver, C$
         $model \leftarrow SVM\_train(features, labels, options)$
     end function

Pseudo RGB-D Face Recognition

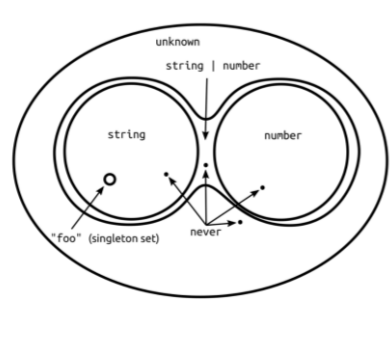## Deep Facial Diagnosis 2

Disease-specific Faces
(a) Beta-thalassemia
(b) Hyperthyroidism
(c) Down syndrome
(d) Leprosy
(e) ?
(f) ?

Generative Model
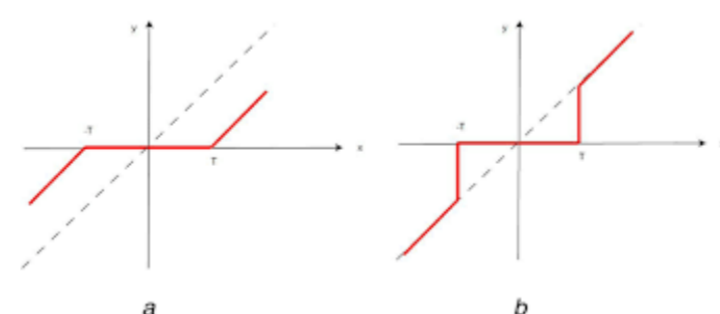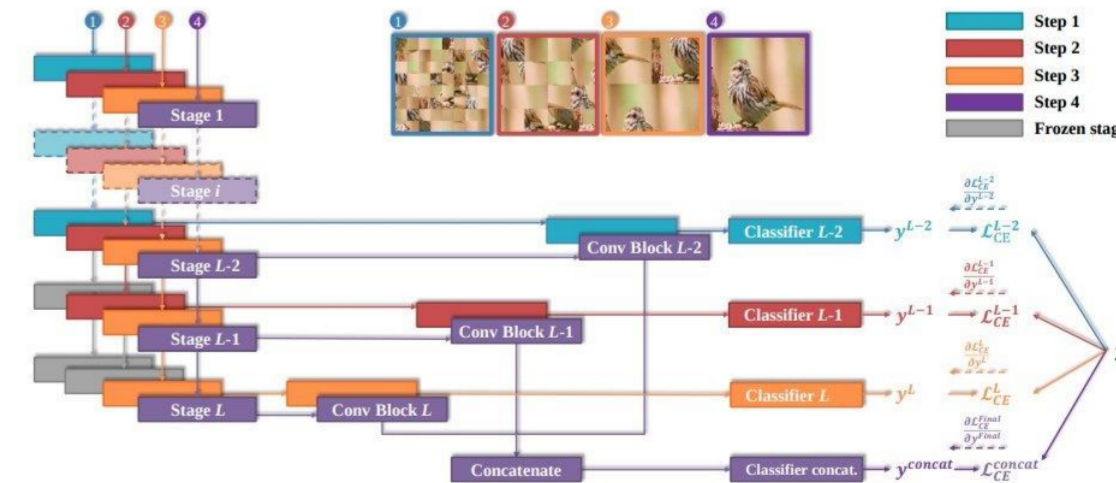(a) cGAN
(b) ACGAN
(c) Pix2Pix
(d) D+GAN
(e) ?

Image Fusion
(a) Soft-threshold
(b) Hard-threshold
(c) ?

Feature Extractor
(a) Deep Facial Diagnosis 1
(b) ?