Fast Preprocessing for Robust Face Sketch Synthesis

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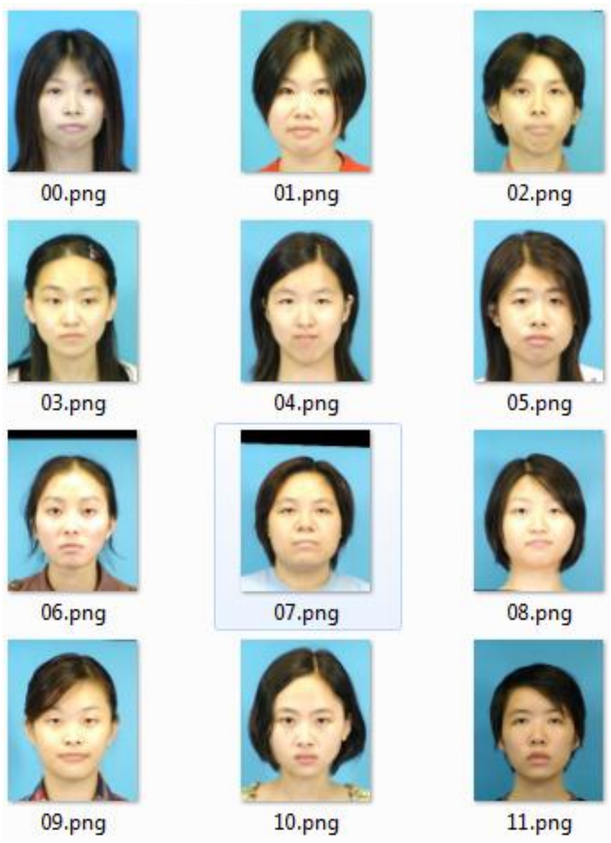
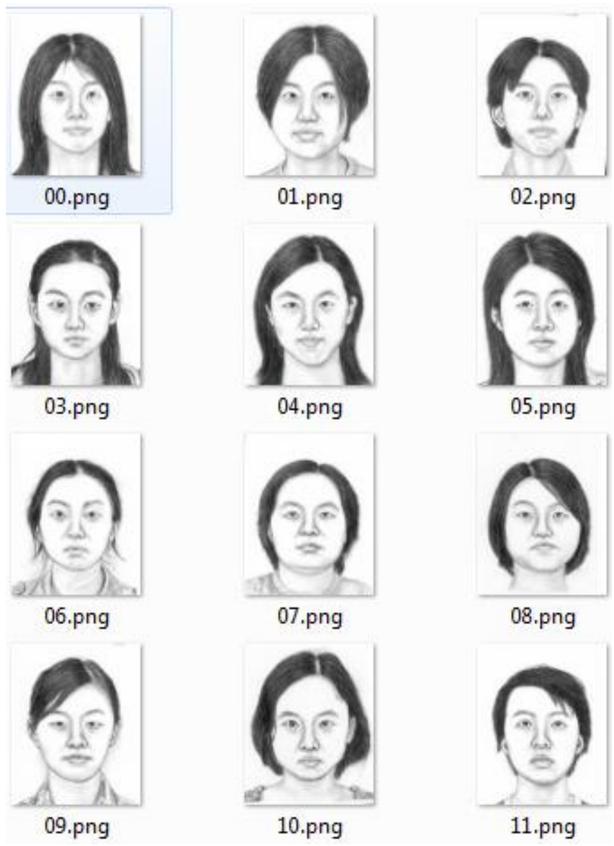
Introduction:

1. photo dataset



Aligned

2. sketch dataset



Input image | Image-based synthesis | Exemplar-based synthesis

- Exemplar-based methods are more stylistic for face sketch synthesis.
- Patch correspondence is importance for sketch synthesis
- Lighting and pose variance becomes the patch matching bottleneck.

Our Contributions:

- ✓ Interactively adapt training and input photos for robust patch matching.
- ✓ Easy integration into existing face sketch synthesis methods.
- ✓ Robustness improvement with ignorable computational cost.

Algorithms:

Offline:

1. Decompose training photos into portrait image, alpha matte and non-portrait image via human supervision.
2. Landmarks localization for facial region identification.

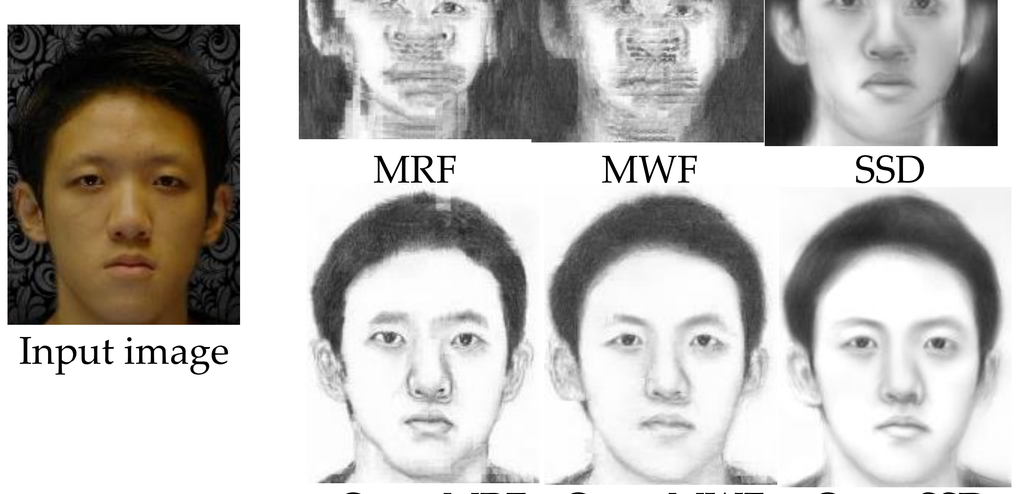
Online:

1. We compute two linear mapping function for joint adaptation.
2. The first one is to adapt the input photo to enable facial region statistics similar with those of the training photos.
3. The second one is to adjust the training non-portrait image to enable overall image statistics similar with input photo.
4. We recompose portrait image, alpha matte and non-portrait image to generate adapted training photos.

✓ **The facial and non-facial regions between input and training photos are adjusted independently similar.**

Visual Results:

Input image | MRF | MWF | SSD



Input image

MRF | MWF | SSD

Ours+MRF | Ours+MWF | Ours+SSD

References:

MRF: Face Photo-Sketch Synthesis and Recognition. Wang et al. IEEE PAMI 2009.
MWF: Markov Weight Fields for Face Sketch Synthesis. Zhou et al. CVPR 2012.
SSD: Real-Time Exemplar-Based Face Sketch Synthesis. Song et al. ECCV 2014.