SREFI: Synthesis of Realistic Example Face Images

S. Banerjee\textsuperscript{1}, J. Bernhard\textsuperscript{2}, W. Scheirer\textsuperscript{1}, K. Bowyer\textsuperscript{1}, and P. Flynn\textsuperscript{1}

\textsuperscript{1}University of Notre Dame, USA, \textsuperscript{2}FaceTec Inc., USA

(sbanerj1@nd.edu)

I. Face Pooling (offline)

II. Reshape Facial Parts (offline)

III. Online Elements

A. Motivation

B. Our Synthesis Method

C. Qualitative Results

I. Identity Preserving Synthesis (512x512)

II. Synthetic Subjects (512x512)

D. Quantitative Results

I. Human Rater Study (20 raters)

II. Verification Results (VGG-FACE)

III. Performance on GBU-Ugly (VGG-16)

E. Coming Soon

• Extract 'fc7' features from VGG-FACE for all real images in gallery.
• Features scored using cosine similarity.
• Facial parts pooled from $k$ subjects in the 100 nearest neighbors of 'base face' ($7 < k < 10$).

• Pre-compute permissible range of ratio between different facial parts (same gender & ethnicity).
• Randomly pick shape of facial parts within permissible range.

• Landmarker: Kazemi & Sullivan (from Dlib).

• Average Runtime: 2 – 3 seconds (512x512).

I. Triangulation

II. Recombining triangles

III. Blending

I. Intersection

II. Recombining triangles

III. Blending

- Extract 'fc7' features from VGG-FACE for all real images in gallery.
- Features scored using cosine similarity.
- Facial parts pooled from $k$ subjects in the 100 nearest neighbors of 'base face' ($7 < k < 10$).

- Pre-compute permissible range of ratio between different facial parts (same gender & ethnicity).
- Randomly pick shape of facial parts within permissible range.

- Landmarker: Kazemi & Sullivan (from Dlib).

- Average Runtime: 2 – 3 seconds (512x512).

I. Intersection

II. Recombining triangles

III. Blending

- Extract 'fc7' features from VGG-FACE for all real images in gallery.
- Features scored using cosine similarity.
- Facial parts pooled from $k$ subjects in the 100 nearest neighbors of 'base face' ($7 < k < 10$).

- Pre-compute permissible range of ratio between different facial parts (same gender & ethnicity).
- Randomly pick shape of facial parts within permissible range.

- Landmarker: Kazemi & Sullivan (from Dlib).

- Average Runtime: 2 – 3 seconds (512x512).

* Hardware support was generously provided by NVIDIA.