The Evaluated Image

(i) Image Preprocessing

Input

Superpixel

Input Patch with Superpixel Segmentation

Stage One: Local Feature Aggregation

Cosine Similarity

Stage Two: Non-Local Feature Aggregation

(ii) Graph Neural Network – Non-Local Modeling Method

One GNN Layer and the GNN module

(iv) Feature Mean & Std Fusion and Quality Prediction

Distortion Type Identification Loss L_t

D

FC

512

Quality Prediction Loss L_q

1

FC

512

Quality Ranking Loss L_r

Image Pair Rank

Inference – Final Quality Prediction

Average

q_{out}

Input Patch

$112 \times 112 \times 3$

$112 \times 112 \times 64$

$56 \times 56 \times 128$

$28 \times 28 \times 256$

$14 \times 14 \times 512$

$7 \times 7 \times 512$

$3 \times 3 \times 512$

(iii) Pre-trained VGGNet-16 – Local Modeling Method