HiFaceGAN: Face Renovation via Collaborative Suppression and Replenishment

Overview
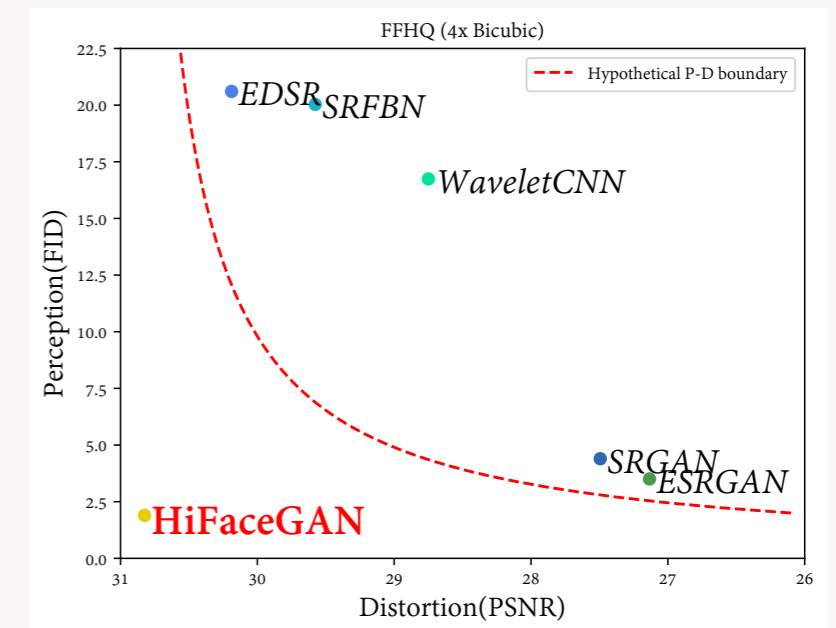
► Existing face restoration methods with explicit prior constraints suffer from poor generalization over real-world images.

► … so Face Renovation aims to explore the "dual-blind" restoration without prior constraints on either the degradation or image contents.

► … this leads to HiFaceGAN, a generic purpose solution for face restoration under arbitrary degradation.

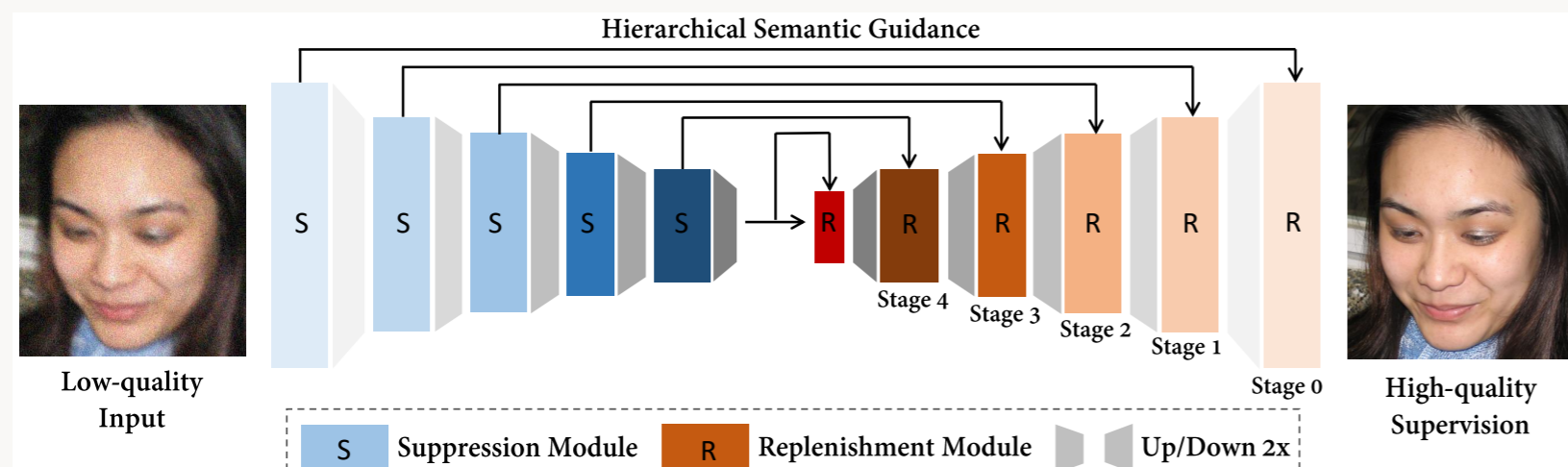► … which achieves SOTA on 6 subtasks and generalize well to real-world cases.

Model card

Name : HiFaceGAN

Architecture : Nested CSR units

CSR unit :
  Encoder: pixel-adaptive conv.
  Decoder: SPADE

Loss : Adv + FM + VGG (1:10:10)

Num. Params : 70 ~ 90 M

Train Memory : 11 ~ 15 Gb

Default Resolution : 512×512

Inf. Speed : 5 fps on Nvidia P100

Github : https://github.com/Lotayou/Face-Renovation

Improved P-D Tradeoff

HiFaceGAN simultaneously surpasses SOTA SR methods on perception and distortion.

FFHQ (4x Bicubic). Perception(FID) vs Distortion(PSNR). Methods: EDSR, SRFBN, WaveletCNN, SRGAN, ESRGAN, HiFaceGAN. Hypothetical P-D boundary.

Network Architecture

Hierarchical Semantic Guidance. Low-quality Input → S S S S S S → R R R R R R (Stage 4, Stage 3, Stage 2, Stage 1, Stage 0) → High-quality Supervision. S: Suppression Module, R: Replenishment Module, Up/Down 2x.

A Stunning Example

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