Component Attention Guided Face Super-Resolution Network: CAGFacea

Ratheesh Kalarot
Adobe

Tao Li
Purdue University

Prof. Fatih Porikli
ANU, Qualcomm

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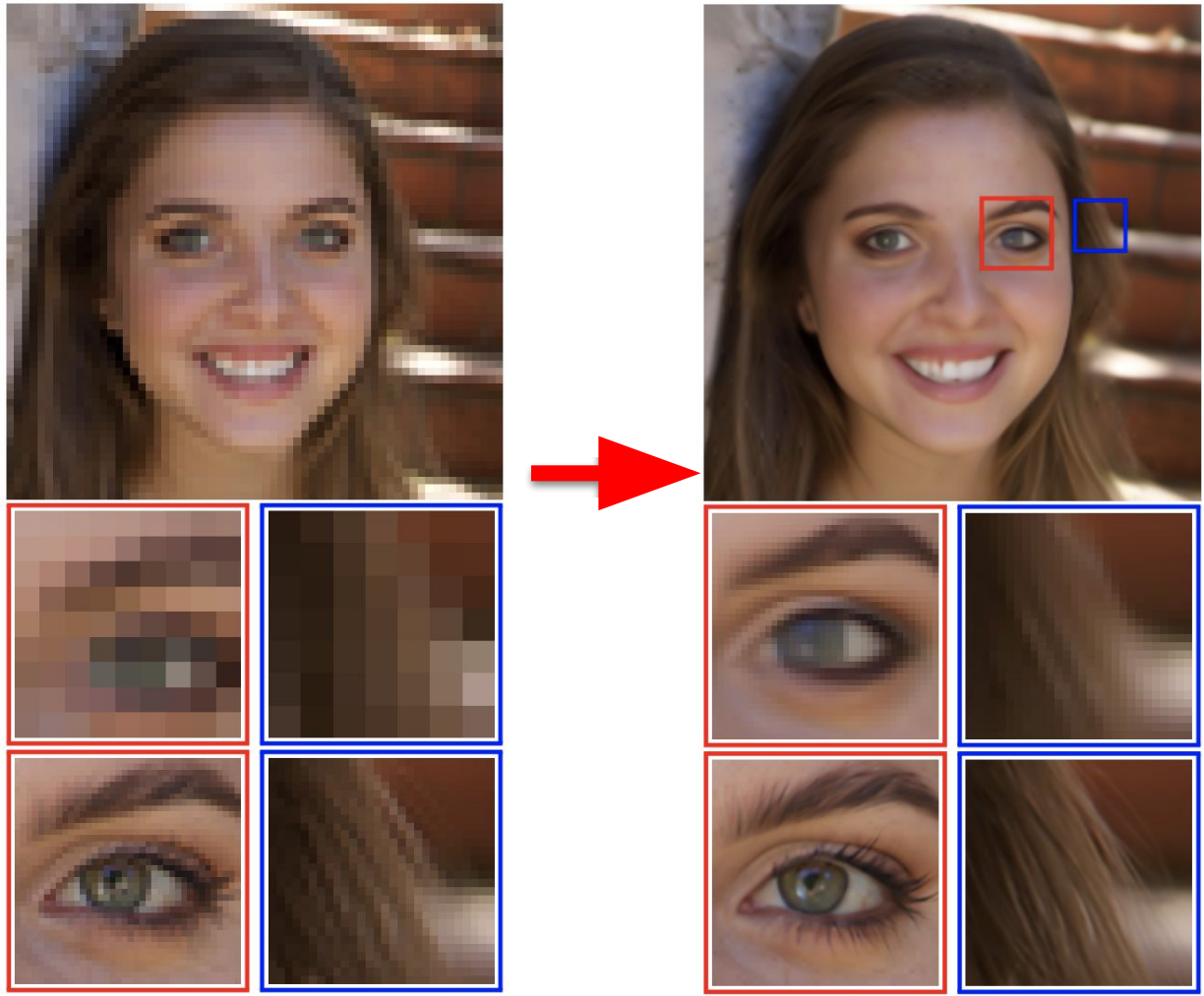
FSR

Face Super Resolution (FSR):converts a low resolution (LR) face image to a corresponding high resolution(HR) image.

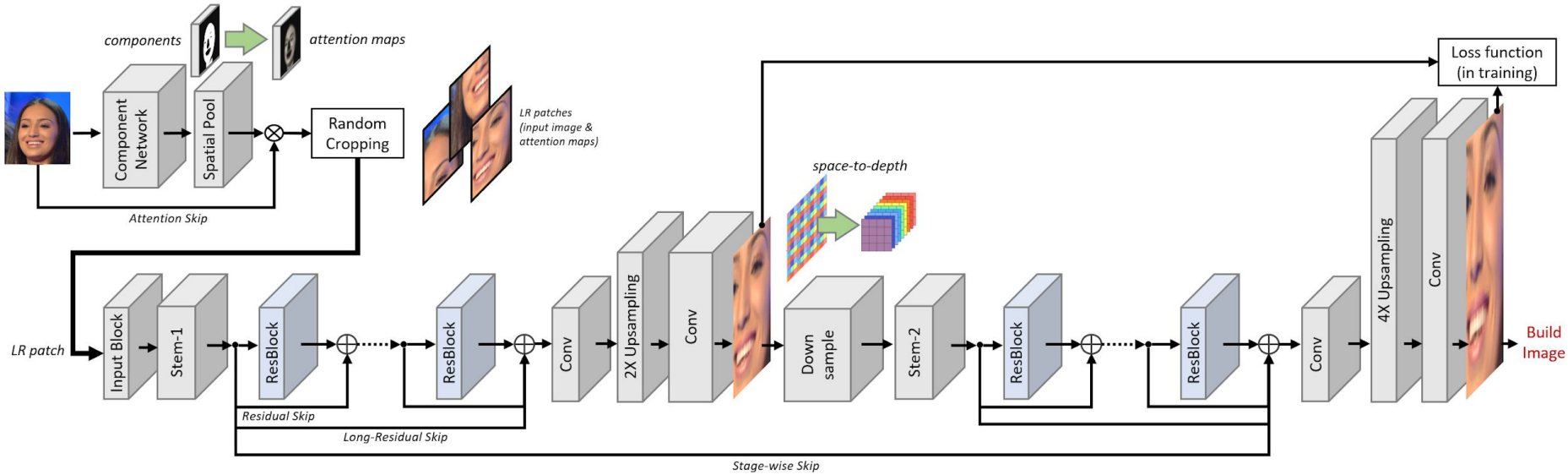
We present state-of-the-art FSR method results in a broad spectrum of real-life scenarios without inducing perceptual artifacts.



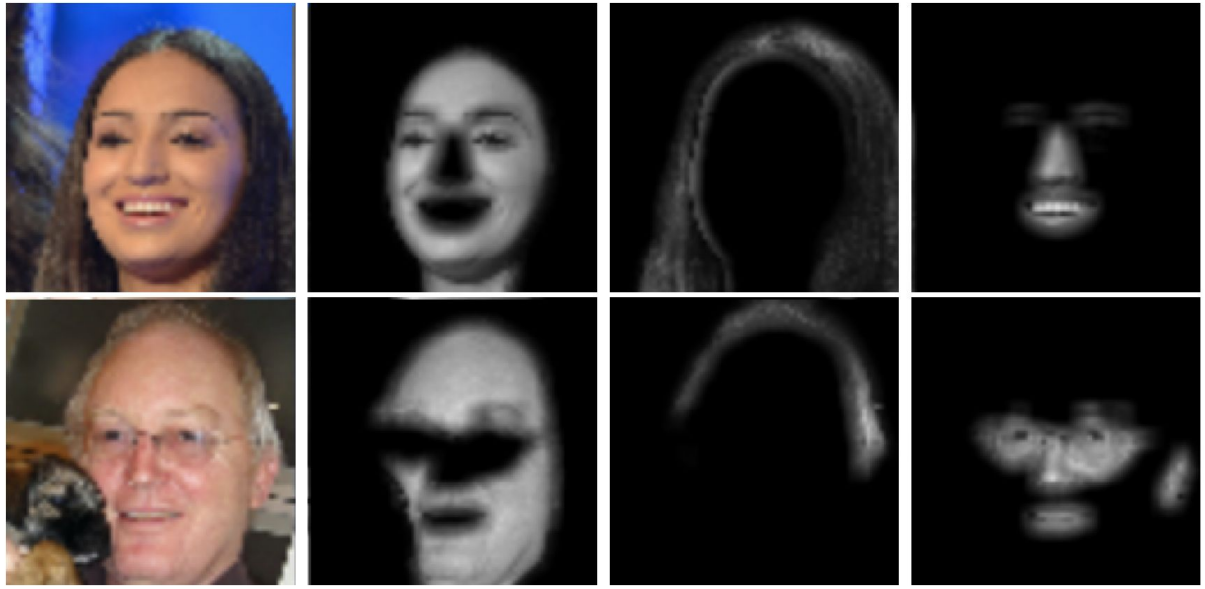
Contributions

- A novel a **patch-based**, fully convolutional network for face image face super-resolution
  - Processes patches in their original low-resolution throughout its backbone
  - Drives **networks attention by face component masks**
- **Multi stage architecture**
  - Recurrently apply the super-resolution stages to leverage on the reconstructed high-resolution outputs from the previous stage to enhance estimated high resolution details progressively.
- The experiments demonstrate **SOTA**
  - Best SSIM/PSNR/FID results compared to existing methods.
  - Not much perceptual artifacts!

CAGFace architecture



Sample Attention Maps

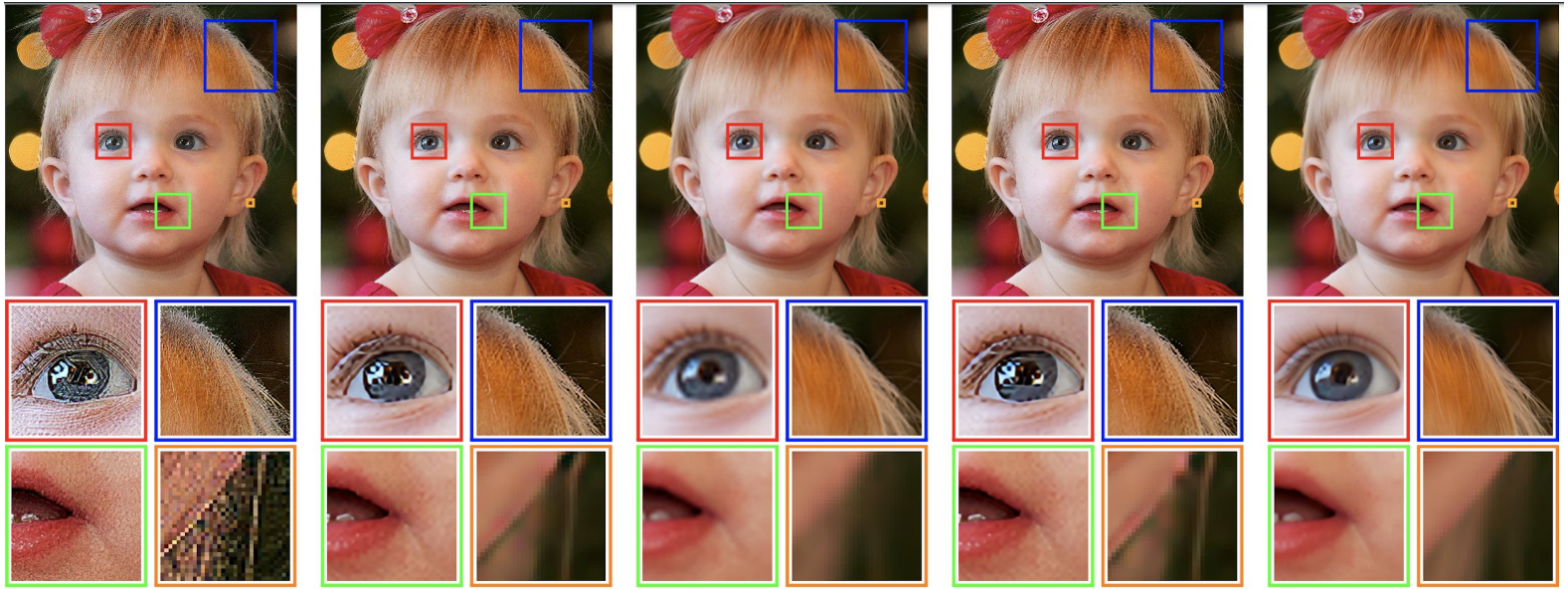


(a) Input (b) Skin (c) Hair (d) Other parts

Results (256x256)

(a) Input (PSNR / SSIM)
(b) SRCNN [10] (22.82 / 0.668)
(c) EDSR [33] (21.78 / 0.689)
(d) SRGAN [30] (17.48 / 0.420)
(e) E-Net [41] (23.08 / 0.679)
(f) SRFBN [32] (21.12 / 0.673)
(g) Ours (26.79 / 0.800)

Results (1024x1024)



(f) ESRGAN [55] (17.41 / 0.183)

(g) EDSR [33] (27.14 / 0.773)

(h) EnhanceNet [41] (29.24 / 0.799)

(i) SRFBN [32] (26.65 / 0.765)

(j) Ours (33.92 / 0.893)

Quantitative Results

	PSNR	SSIM	MS-SSIM	FID
Bicubic	25.57	0.766	0.935	135.51
SRCNN [10]	23.12	0.688	0.900	147.21
FSRCNN [11]	22.45	0.709	0.930	139.78
EDSR [33]	22.47	0.706	0.901	129.14
SRGAN [30]	17.57	0.415	0.757	156.07
ESRGAN [55]	15.43	0.267	0.747	166.36
EnhanceNet [41]	23.64	0.701	0.897	116.38
SRFBN [32]	21.96	0.693	0.895	132.59
Ours	**27.42**	**0.816**	**0.958**	**74.43**

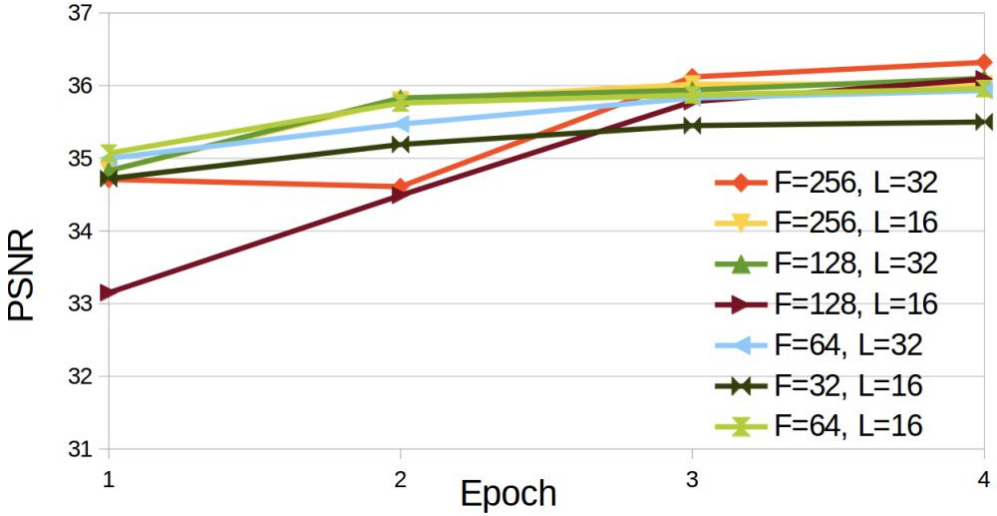
256x256

	PSNR	SSIM	MS-SSIM	FID
Bicubic	31.87	0.872	0.956	**10.65**
SRCNN [10]	27.40	0.801	0.924	31.84
FSRCNN [11]	24.71	0.804	0.951	23.97
EDSR [33]	28.34	0.827	0.933	15.54
SRGAN [30]	21.49	0.515	0.807	60.67
ESRGAN [55]	19.84	0.353	0.782	72.73
EnhanceNet [41]	29.42	0.832	0.934	19.07
SRFBN [32]	27.90	0.822	0.931	17.14
Ours	**34.10**	**0.906**	**0.971**	12.40

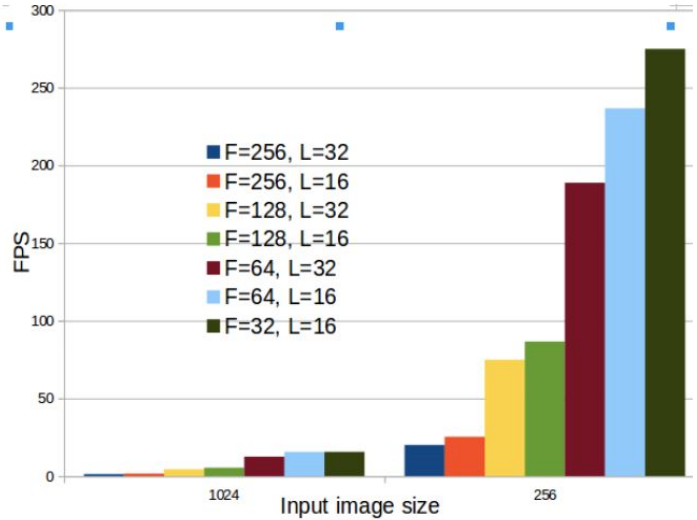
1024x1024

Ablation study

Accuracy



Speed



F: feature count L:layer cound

Thanks!

Please visit our poster **#1272**.

arXiv: https://arxiv.org/abs/1910.08761

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