# Deep Restoration of Vintage Photographs From Scanned Halftone Prints

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### A Supplementary Material

#### A.1 Sample Results

Shown as follows are the inverse halftoning results of the proposed method and existing techniques including Sattva [1], ESRGAN [3], CycleGAN [6], Unet [2], DNIH[4]. Overall, the proposed method produces sharper and more natural looking results in comparison with the other tested techniques. In fine scale, the results of the proposed method are cleaner and more realistic, while the results of the compared techniques are often plagued by noise and various artifacts. Please zoom in to see the differences.



(c) DNIH

(e) Unet

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(a) Halftone







(f) CycleGAN



(c) DNIH



(e) Unet



(g) Proposed



(a) Halftone



(b) Sattva

(c) DNIH



(d) ESRGAN



(e) Unet



(f) CycleGAN



(g) Proposed



(c) DNIH



(a) Halftone



(c) DNIH



(e) Unet



(g) Proposed



(g) Proposed



(c) DNIH

(e) Unet



(c) DNIH

(e) Unet







(c) DNIH

(e) Unet

(g) Proposed



(c) DNIH

(e) Unet

(g) Proposed

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(a) Halftone



(b) Sattva



(c) DNIH



(d) ESRGAN



(e) Unet



(f) CycleGAN



(g) Proposed



(a) Halftone



(b) Sattva



(c) DNIH



(d) ESRGAN



(e) Unet



(f) CycleGAN







(a) Halftone











(f) CycleGAN





(e) Unet





(a) Halftone







(f) CycleGAN



(c) DNIH



(e) Unet



(g) Proposed



(a) Halftone



(c) DNIH



(e) Unet





(a) Halftone



(b) Sattva



(c) DNIH



(d) ESRGAN



(f) CycleGAN



(g) Proposed



(a) Halftone



(b) Sattva



(e) Unet

(d) ESRGAN







(f) CycleGAN





(c) DNIH



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(a) Halftone



(g) Proposed

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(a) Halftone



(c) DNIH



(g) Proposed



(a) Halftone



(b) Sattva

(c) DNIH



(d) ESRGAN



(f) CycleGAN









(c) DNIH

(g) Proposed



(c) DNIH

(e) Unet



(a) Halftone



(c) DNIH

(e) Unet



(g) Proposed



(a) Halftone







(f) CycleGAN







(c) DNIH

(e) Unet

#### A.2 Face Detection on Restored Halftone Images

To evaluate their reconstruction qualities, we run face detection algorithm MTCNN [5] on the output images of the tested inverse halftoning techniques. In the following sample results, the detected faces by MTCNN are highlighted with framed boxes. On average, MTCNN produces the most accurate detection results when the input image is restored by the proposed technique, because the results of the proposed techniques are cleaner and of fewer artifacts than the competition.



Halftone

Sattva

ESRGAN

CycleGAN

Unet





Halftone

Sattva

ESRGAN



CycleGAN

Unet

Proposed

## References

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