

## Invertible Grayscale: Supplemental Material

MENGHAN XIA, XUETING LIU, TIEN-TSIN WONG, Department of Computer Science & Engineering, The Chinese University of Hong Kong and Shenzhen Key Laboratory of Virtual Reality and Human Interaction Technology, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China

### ACM Reference Format:

Menghan XIA, Xueting LIU, Tien-Tsin WONG. 2018. Invertible Grayscale: Supplemental Material. *ACM Trans. Graph.* 37, 6, Article 1 (November 2018), 3 pages. <https://doi.org/10.1145/3272127.3275080>

### 1 USER STUDY QUESTIONNAIRES

We have two user studies. One of them evaluates the similarity between the restored color image and the original color image. The other evaluates the quality and visual conformity of the generated grayscale image. In both user studies, 14 example images are used, including all images shown in Fig. 3 and Fig. 12 of the paper. The questionnaires for the two user studies are presented in Fig. 1 and Fig. 2 respectively. The statistics is presented and discussed in Section 7.3 in the paper.



Q1: Give a score to indicate the similarity of the two color images. (0: very different; 5: exactly the same)

	0	1	2	3	4	5
1. Grayscale 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Grayscale 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Fig. 1. Questionnaire for color image evaluation in the user study.

---

Author's address: Menghan XIA, Xueting LIU, Tien-Tsin WONG, Department of Computer Science & Engineering, The Chinese University of Hong Kong, Hong Kong, and Shenzhen Key Laboratory of Virtual Reality and Human Interaction Technology, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China, [mhxia@cse.cuhk.edu.hk](mailto:mhxia@cse.cuhk.edu.hk), [xtliu@cse.cuhk.edu.hk](mailto:xtliu@cse.cuhk.edu.hk), [ttwong@cse.cuhk.edu.hk](mailto:ttwong@cse.cuhk.edu.hk).

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from [permissions@acm.org](mailto:permissions@acm.org).

© 2018 Association for Computing Machinery.

0730-0301/2018/11-ART1 \$15.00

<https://doi.org/10.1145/3272127.3275080>



Q1: Which grayscale do you prefer ?

- Grayscale 1
- Grayscale 2
- Both

Q2: Give a score to each grayscale based on their conformity to the color image, e.g. content, detail, contrast, etc. (0: very low conformity; 5: very high conformity)

	0	1	2	3	4	5
1. Grayscale 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Grayscale 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Fig. 2. Questionnaire for grayscale image evaluation in the user study.

## 2 MORE RESULTS

We present more results in Fig. 3.

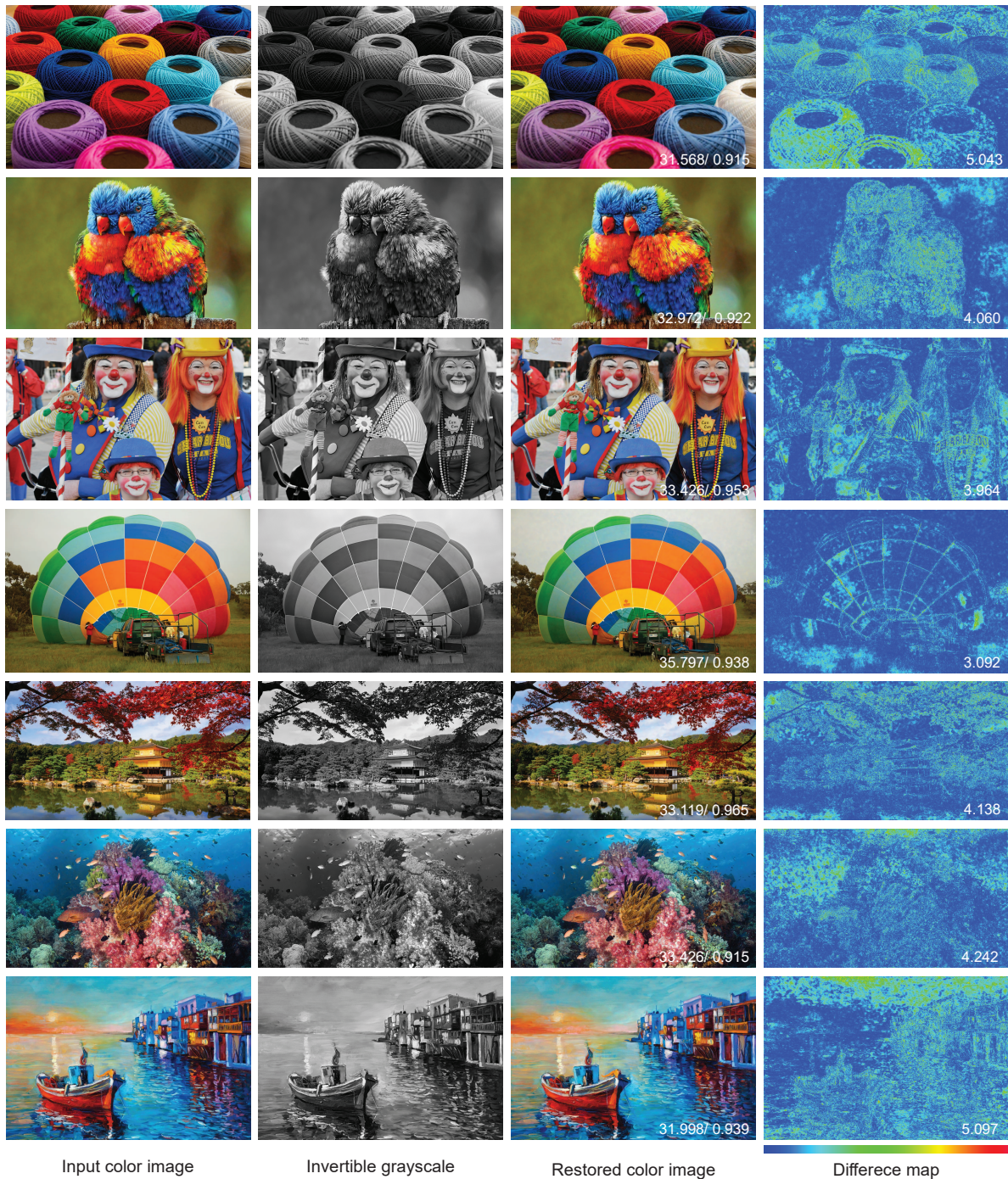


Fig. 3. More results: The PSNR/SSIM with respective to the groundtruth are annotated in the restored color images. The difference maps between the restored color images and the groundtruth are illustrated in the range  $[0, 32]$ . The MAE with respective to the groundtruth are annotated in the difference maps.