Supplementary Material of "A Unified Arbitrary Style Transfer Framework via Adaptive Contrastive Learning"

YUXIN ZHANG, MAIS, Institute of Automation, CAS, China and School of Artificial Intelligence, UCAS, China
FAN TANG, Institute Of Computing Technology, CAS, China
WEIMING DONG, MAIS, Institute of Automation, CAS, China and School of Artificial Intelligence, UCAS, China
HAIBIN HUANG, Kuaishou Technology, China
CHONGYANG MA, Kuaishou Technology, China
TONG-YEE LEE, Department of Computer Science and Information Engineering, National Cheng-Kung University, Taiwan
CHANGSHENG XU, MAIS, Institute of Automation, CAS, China and School of Artificial Intelligence, UCAS, China

In the supplementary material, we present the specific settings, implementation and statistics of the user studies.

Among the 76 participants in User Study I, 52 participants are computer graphics (CG) or computer vision (CV) researchers, 12 participants are artists, and 12 participants are people with other backgrounds. Among the 80 participants in User Study II, 55 participants are CG or CV researchers, 12 participants are artists, and 13 participants are people with other backgrounds. Firstly, the purpose of the style transfer task is introduced to the participants, i.e., transferring the style of a painting image to a photo to generate a picture with corresponding content and style. For each question, the participant is asked to choose the better image that learns the most characteristics from the style image and maintains the semantic information of the content image. To collect faithful results, there is neither a training period nor specific guidelines (e.g., the definition of the "characteristics") given that most of the participants are familiar with image synthesis or art analysis.

A screenshot of our User Study I web pages is shown in Fig. 1. Options A and B show the results of the two image style transfer methods (our method and one of the comparative methods). The

Authors' addresses: Yuxin Zhang, MAIS, Institute of Automation, CAS, China and School of Artificial Intelligence, UCAS, China, zhangyuxin2020@ia.ac.cn; Fan Tang, Institute Of Computing Technology, CAS, China, tangfan@ict.ac.cn; Weiming Dong, MAIS, Institute of Automation, CAS, China and School of Artificial Intelligence, UCAS, China, weiming.dong@ia.ac.cn; Haibin Huang, Kuaishou Technology, China, huanghaibin03@kuaishou.com; Chongyang Ma, Kuaishou Technology, China, chongyangma@kuaishou.com; Tong-Yee Lee, Department of Computer Science and Information Engineering, National Cheng-Kung University, Taiwan, tonylee@ncku.edu.tw; Changsheng Xu, MAIS, Institute of Automation, CAS, China and School of Artificial Intelligence, UCAS, China, csxu@nlpr.ia.ac.cn.
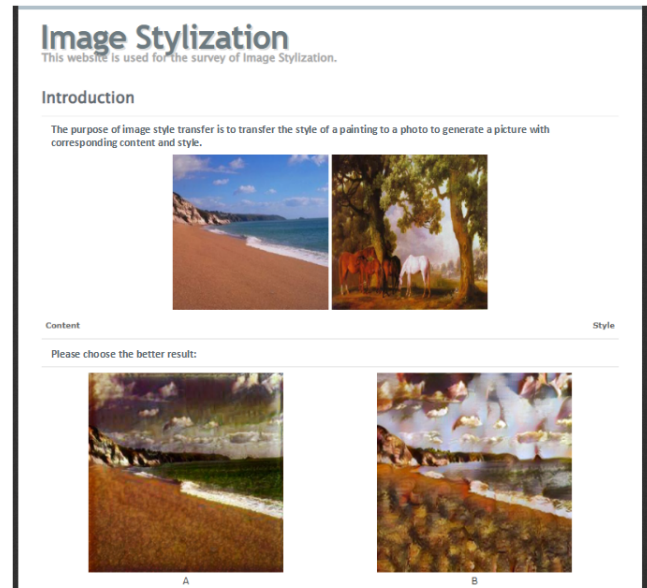
Fig. 1. Screenshot of our user study I web pages.

comparative method tested in each question and the order of the options are both random.

Table 1 shows the detailed statistics of User Study I and II. We divide the participants into CG and CV researchers, artists and others, and compute their results separately. User Study I shows the preferences of three groups of people for different methods. It can be seen that our method won the preference of more art practitioners while being superior to other methods. The difference between the scores of the three groups of people and the weighted average score is within 5%. User Study II shows the results of three groups' Stylized Authenticity Detection of different methods. Professionals in CG & CV and artists identified generated images with higher precision and recall than others.

Table 1. The results of user study I and II . The best results are **bolded**.

Method	User Study I			User StudyII					
				Precision↓			Recall↓		
	CG&CV	Artists	Others	CG&CV	Artists	Others	CG&CV	Artists	Others
StyleTr^2	38.2%	35.0%	41.9%	60.2%	61.9%	51.2%	57.2%	61.2%	50.4%
StyleFormer	39.5%	35.0%	44.3%	68.5%	67.7%	61.2%	64.4%	68.2%	54.7%
IEST	41.1%	39.6%	43.4%	67.3%	64.6%	59.3%	59.3%	65.2%	49.5%
AdaAttN	38.5%	37.3%	42.2%	64.4%	65.1%	54.8%	59.6%	61.1%	50.2%
MCCNet	35.2%	33.8%	42.6%	77.8%	74.4%	55.0%	72%	72.2%	64.4%
ArtFlow	38.7%	35.0%	46.5%	60.1%	61.1%	51.1%	56.3%	57.1%	50.6%
AdaIN	25.5%	22.1%	43.0%	75.9%	76.5%	53.8%	66.2%	65.8%	56.7
UCAST	-	-	-	**40.2**%	**40.1**%	**34.1**%	**36.2**%	**37.0**%	**36.0**%