

GladCoder: Stylized QR Code Generation with Grayscale-Aware Denoising Process

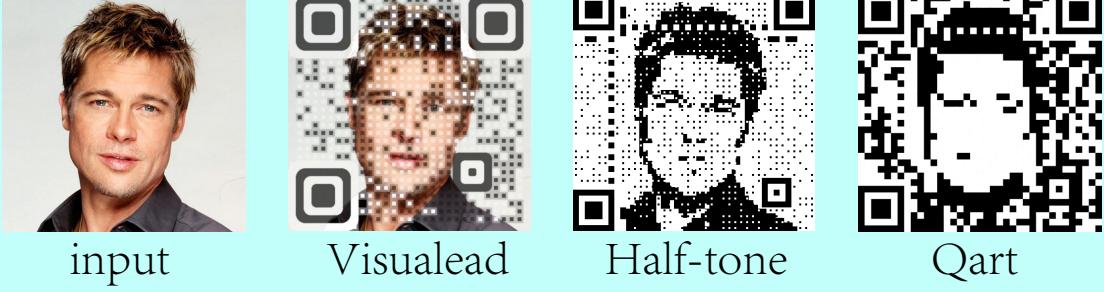
Yuqiu Xie¹, Bolin Jiang¹, Jiawei Li², Naiqi Li¹,
Bin Chen³, Tao Dai⁴, Yuang Peng¹, Shu-tao Xia¹

¹Tsinghua University, ²Huawei Manufacturing, ³Harbin Institute of Technology (Shenzhen), ⁴Shenzhen University



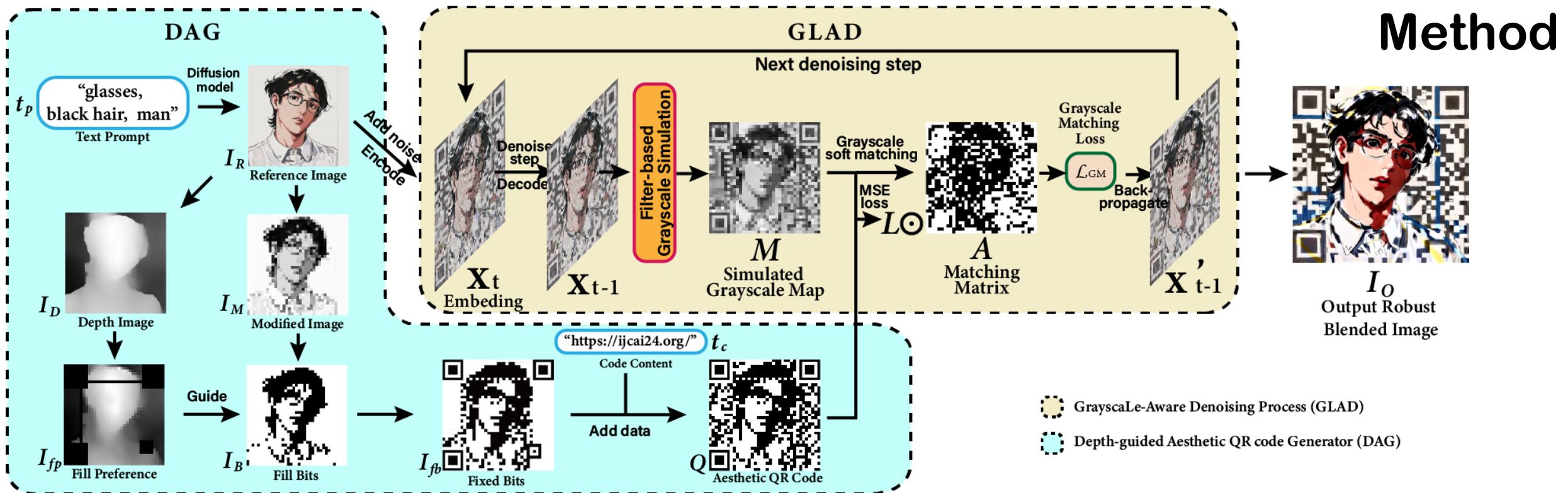
- Traditional QR codes consist of a grid of black-and-white square modules, which lack aesthetic appeal and meaning for human perception.
- There exists a trade-off between the visual quality and scanning-robustness of the image, causing outputs of previous works are simple and of low quality to ensure scanning-robustness.
- In this paper, we introduce a novel approach **GladCoder** to generate stylized QR codes that are personalized, natural, and text-driven.

Traditional Aesthetic QR Codes



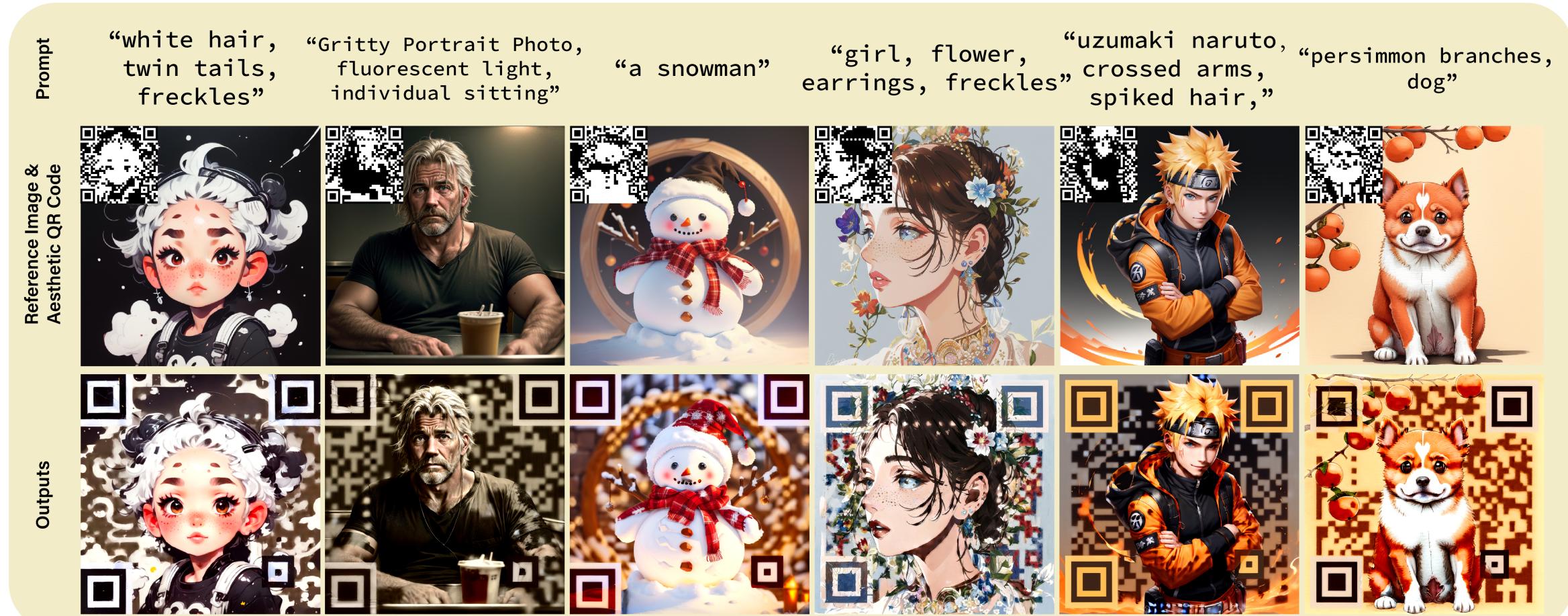
Introduction

Generation-based Aesthetic QR Codes



- The workflow takes in two text string inputs: *one* for guidance of image content, and *one* as scanning result.
- The principle goal of our method is to solve the mismatch between the QR code and the reference image.
- On the one hand, GladCoder utilizes an depth-guided aesthetic QR code generation process, constructing an aesthetic QR code image that is more compatible with reference image than standard QR codes.
- On the other hand, GladCoder enhances the scanning robustness based on the aesthetic QR code, while keeping the image roughly the same, through a grayscale-aware denoising process.

Experiments



Average scanning success rate
and decoding time

Method	App	4cm ²	7cm ²	10cm ²
Artcoder	Wechat	92%/1.93s	96%/1.57s	98%/1.29s
	Alipay	86%/2.33s	98%/1.62s	98%/1.67s
	Facebook	0%/-	5%/1.19s	86%/1.15s
	Tiktok	98%/0.78s	100%/0.75s	100%/0.74s
QRBT	Wechat	100%/0.95s	100%/0.96s	99%/0.95s
	Alipay	100%/0.97s	61%/1.14s	20%/1.37s
	Facebook	0%/-	0%/-	0%/-
	Tiktok	96%/0.77s	83%/0.82s	72%/0.84s
Ours	Wechat	100%/0.96s	100%/1.02s	98%/1.01s
	Alipay	100%/0.98s	98%/1.35s	94%/1.66s
	Facebook	98%/0.96s	98%/0.93s	98%/0.89s
	Tiktok	100%/0.75s	100%/0.75s	99%/0.78s

Stylization Comparison

