

STRUCT @ PKU



patial and Temporal Restoration, Understanding and Compression Team

Introduction

Motivation

Artistic typography design is an important part in visual designs. However, it requires great time and skills for an artist to design, and there is no research on automatic text stylization. This practical requirement motivates us to investigate automatically transferring various fantastic text effects onto raw plain texts



Challenges

- 1. The extreme diversity of the text effects and character shapes
- 2. The complicated composition of style elements
- 3. The simpleness of guidance images

To cope with these challenges, our key idea is to exploit the analytics on the *high regularity* of the spatial distribution for text effects to guide the synthesis process.

HIGH CORRELATION BETWEEN PATCH PATTERNS AND THEIR DISTANCES TO TEXT SKELETONS



Awesome Typography: Statistics-Based Text Effects Transfer

Shuai Yang, Jiaying Liu, Zhouhui Lian and Zongming Guo Institute of Computer Science and Technology, Peking University, Beijing, China

Text Effects Statistics Estimation









scale map

Text image visualized patch scale

• Optimal patch scale detection: Detect the optimal patch scale scal(*p*) to depict texture patterns round pixel *p*.

- Robust normalized distance estimation: Calculate the distance dist(p) between each pixel p to the text skeleton S.
- Optimal scale posterior probability estimation: Deduce the posterior probability P(I,dist(q)) for I being the appropriate scale to depict the patches with distances corresponding to dist(q).

Text Effect Transfer





distance map

Appearance Term: Texture Style Transfer low-level cues; objective evaluation $E_{app}(p,q) = \lambda_3 \sum_{l} P(l | dist(p)) ||P_l(p) - Q_l(q)||^2$ + $\sum_{l} P(l | dist(p)) || P'_{l}(p) - Q'_{l}(q) ||^{2}$

Distribution Term: Spatial Style Transfer mid-level cues; objective evaluation $E_{dist}(p,q) = (dist(p) - dist(q))^2 / max(dist(p),1)$

Psycho-Visual Term: Naturalness Preservation • prevent over-repetitiveness; subjective evaluation $E_{psy}(p,q) = \#$ of pixels that currently find q as its correspondence

Experiment Results

• Visual comparison





















(S, S')

• Apply different text effects to representative characters



- Salesin. Image analogies. SIGGRAPH, 2001
- 2. O. Frigo, N. Sabater, J. Delon, and P. Hellier. Split and match example-based adaptive patch sampling for unsupervised style transfer. CVPR, 2016.
- 3. A. J. Champandard. Semantic style transfer and turning twobit doodles into fine artworks. 2016. Arvix preprint: https://arxiv.org/abs/1603.01768.

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Analogy¹ Split & match² Neural doodle³ baseline proposed

For more details and implement, scan QR code

