

Motivation: Searching for ideal attributes interactively and flexibly

Want to find the best smile...

Control feature point interactively and flexibly using deep attribute controller

[Requirement]
Detailed expression and flexible control of attribute variations

★ Feature point

Approach: Learning attributes' variations in detail by using deep learning

CFGAN

Identity (latent) z_i and Attribute (latent) z_a are disentangled. The Generator $G(z_i, z_a, y)$ takes these and an observed attribute y to produce a Generated image. The Discriminator $D(x, y)$ compares the Generated image x with a Real image y to discriminate real from generated.

[GAN* (base model)]
Generator G and discriminator D are optimized in an adversarial process.
G: Optimized to deceive D
D: Optimized not to be deceived by G
⇒ Generate realistic images

[CFGAN (proposed model)]**
Incorporate attribute latent variables and filtering architecture
⇒ Learn detailed expressions from simple supervision

Supervision: simple expressions of attributes (E.g., smile or no smile)

Results: Free-feature-point image generation

Detailed expression of attribute variations

Flexible control of attribute variations

Control using slide-bars

Extract identity

Extract attribute

Attribute-based transfer

This system allows users to search for and generate ideal attributes of images in an interactive manner. Based on our deep attribute controller method, it obtains an appropriate feature space within which attributes such as facial expressions can be freely controlled. The system also serves as a general framework for interactive generation of various data.

Demo video



<http://www.kecl.ntt.co.jp/people/kaneko.takuhiro/projects/gpa/>

