Generate and Edit Your Own Character in a Canonical View

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Motivation

- Although the progress of generative models enables the stylization of a portrait image, obtaining the stylized image in canonical (frontal) view is still a challenging task.
- Applying the existing methods sequentially (Stylization → Frontalization or vice versa) shows degenerated results due to domain gap and re-invert operation. Many stylization (e.g., toonifying) methods are based on StyleGAN!
- Therefore, we started with the following question: How can we find the frontal mapping automatically which is done in StyleGAN’s latent space instead of pixel space?

Related Work

- StyleGAN-based editing methods can control the pose of image implicitly by finding pose-related directions, but they can’t operate accurate mapping for frontalizing automatically (Need some continuous adjustments to find frontal image!)
- Among them, InterFaceGAN [3] can obtain canonical pose by using a semantic hyperplane, but it requires 3D supervision for binary classification in order to calculate the hyperplane.
- Thanks to the notable successes in 3D-aware GANs (also in CVPR’22!), our novel mapping network can be trained without 3D label, we utilized [2] for the proposed latent mapper to learn frontal mapping.

- We utilized the idea of ‘swapped generator’ [3] for stylization.

Experimental Result – Qualitative & Application

- Extra results (2nd rows denote original results)
- Application: Our method is compatible with many well-studied StyleGAN-based techniques!

- In this paper, we have successfully demonstrated our novel mapping network for frontalization in StyleGAN’s latent space instead of in pixel space.
- Our method is compatible with a number of StyleGAN-based techniques, thus it enables users to stylize or edit the frontalized image.

Future Work

- Monocular 3D face reconstruction
- 3D-controllable StyleGAN