# **Continuous learning of face attribute synthesis**

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The generative adversarial network (GAN) exhibits great superiority in the face attribute synthesis task. Abstract However, existing methods have very limited effects on the expansion of new attributes. To overcome the limitations of a single network in new attribute synthesis, a continuous learning method for face attribute synthesis is proposed in this work. First, the feature vector of the input image is extracted and attribute direction regression is performed in the feature space to obtain the axes of different attributes. The feature vector is then linearly guided along the axis so that images with target attributes can be synthesized by the decoder. Finally, to make the network capable of continuous learning, the orthogonal direction modification module is used to extend the newly-added attributes. Experimental results show that the proposed method can endow a single network with the ability to learn attributes continuously, and, as compared to those produced by the current state-of-the-art methods, the synthetic attributes have higher accuracy.



## Conclusion

- The change directions of different attributes in feature space are explored by extracting the feature of input images.
- A new attribute extension module was proposed, which can separate the interference of basic attributes by decomposing new attributes and obtain independent changes of new attributes without retraining the generated network.
- Via the experiments, it was found that the proposed algorithm can generate high quality of the synthesized images, the manipulation of attributes is more in line with human sensory logic, and more flexible.

### References

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