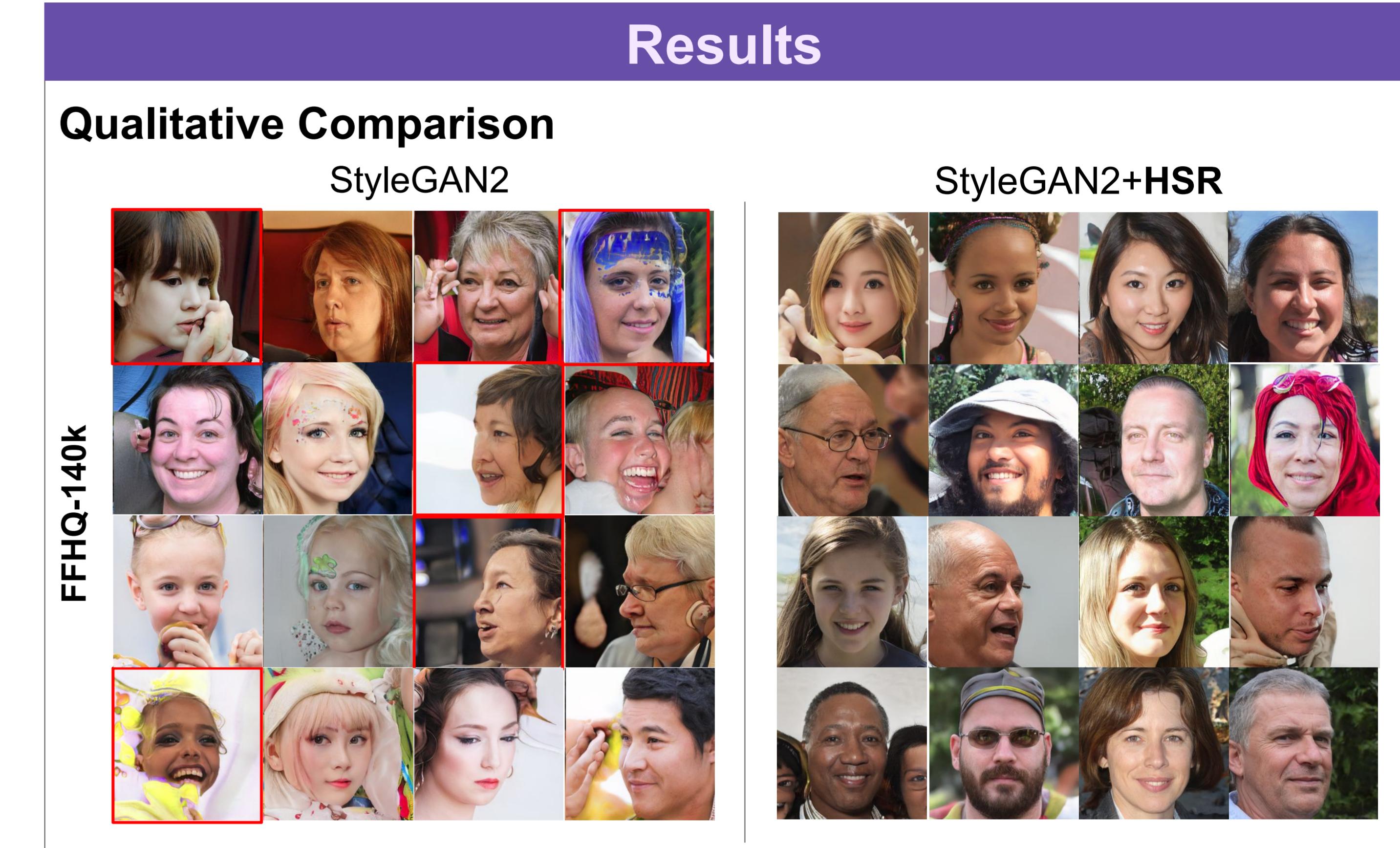
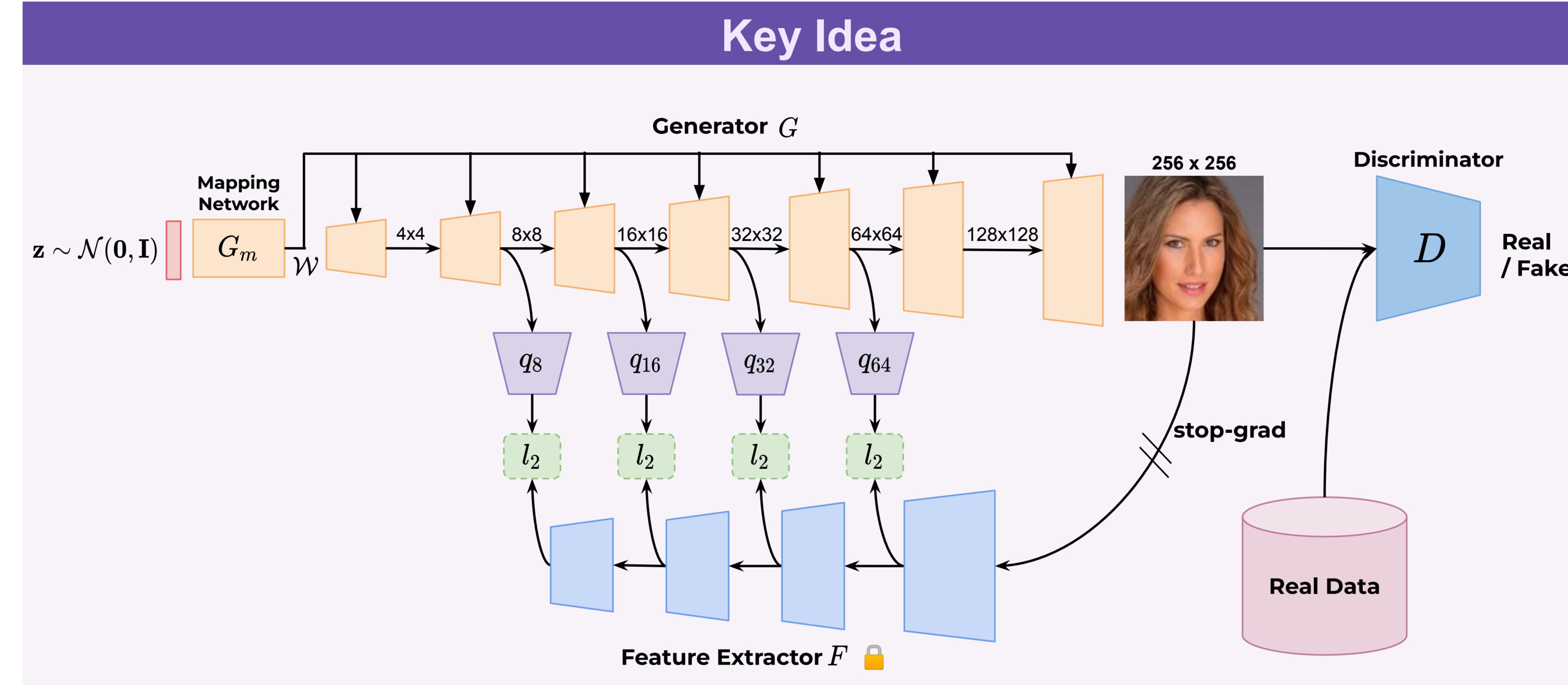
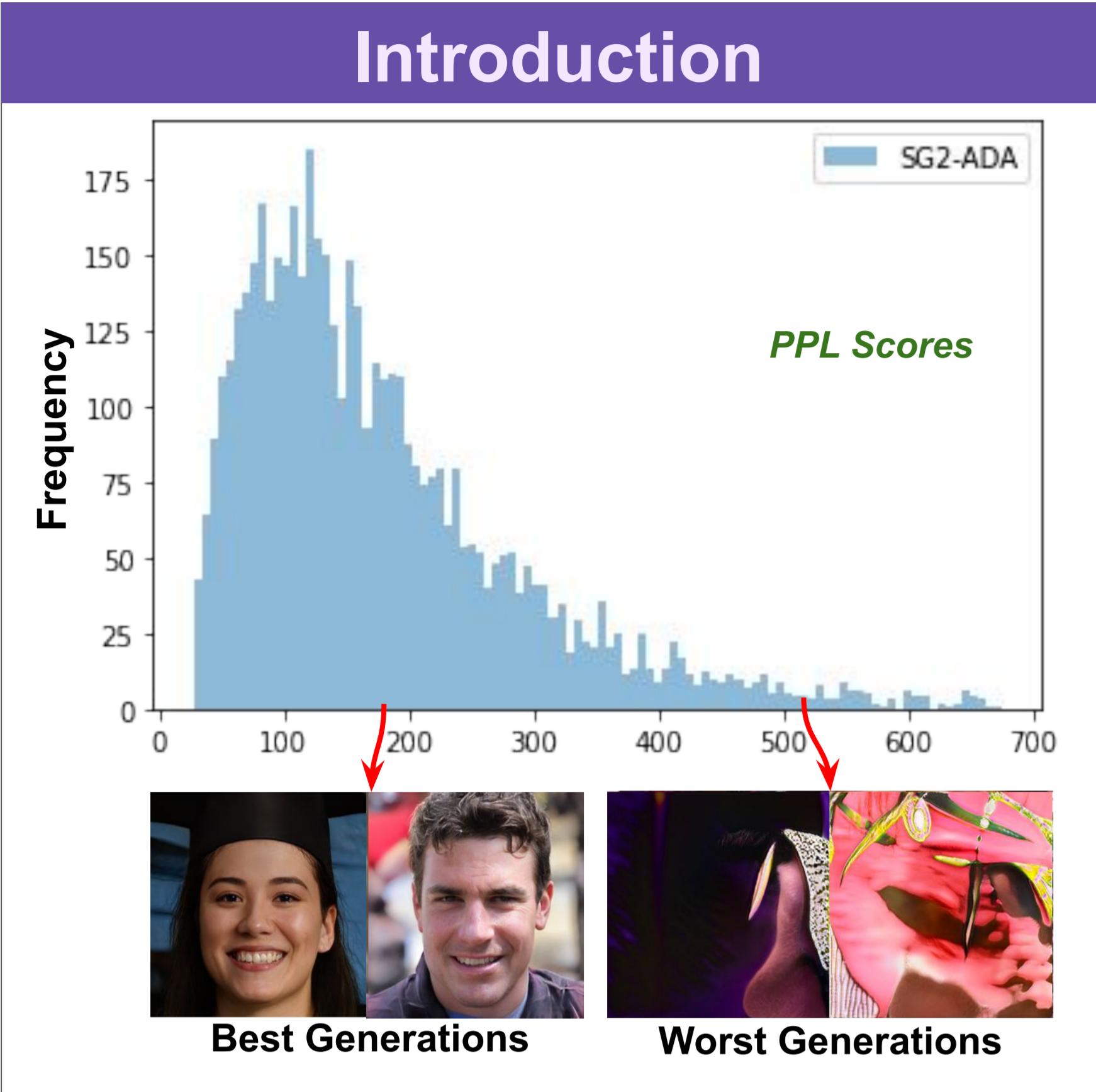
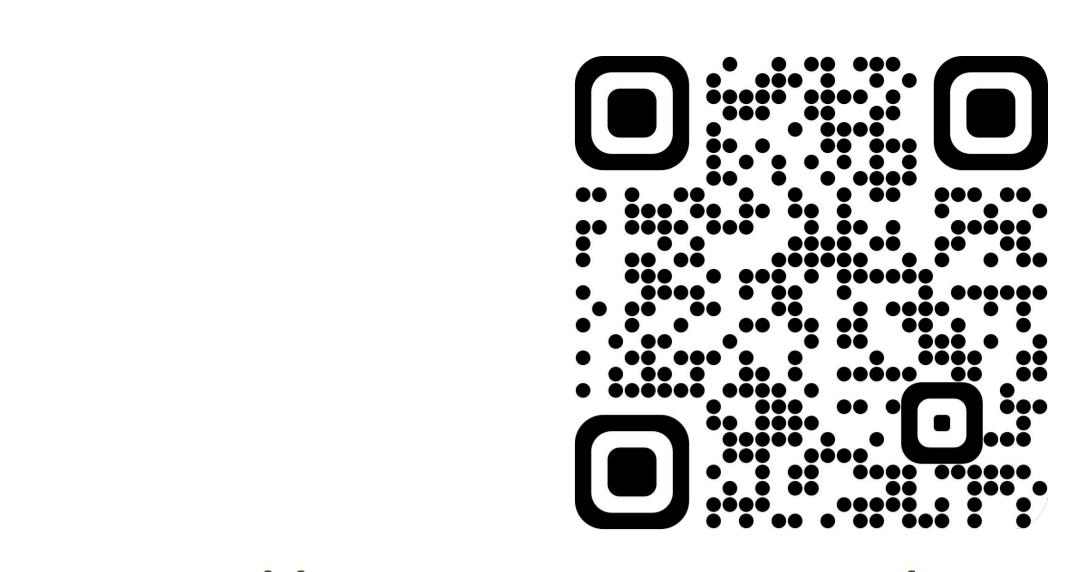


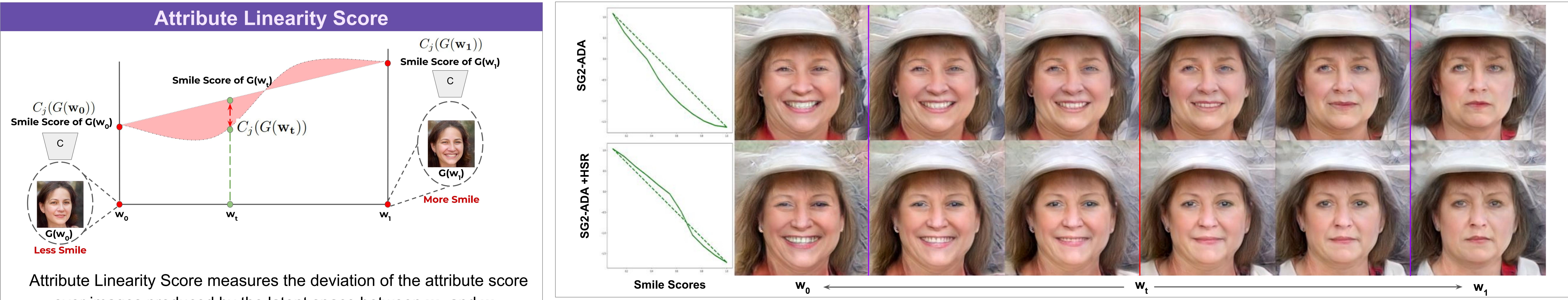
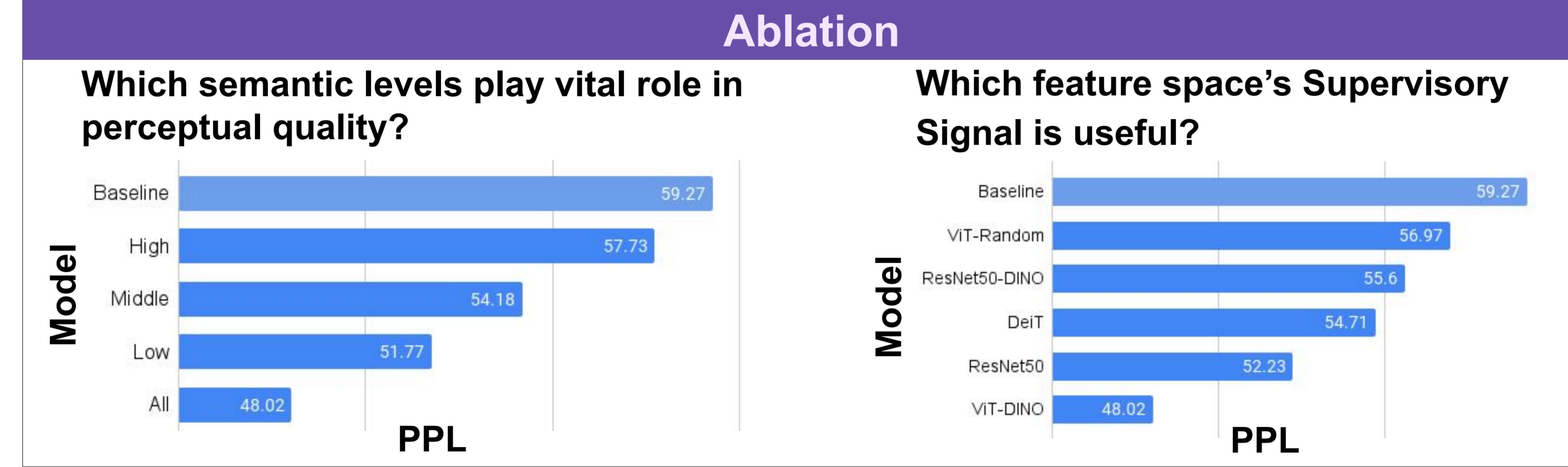


# Hierarchical Semantic Regularization of Latent Spaces in StyleGANs

Tejan Karmali<sup>1,2</sup>, Rishabh Parihar<sup>1</sup>, Susmit Agrawal<sup>1</sup>, Harsh Rangwani<sup>1</sup>  
Varun Jampani<sup>2</sup>, Maneesh Singh<sup>3</sup>, R. Venkatesh Babu<sup>1</sup>  
<sup>1</sup>Indian Institute of Science, <sup>2</sup>Google Research, <sup>3</sup>Motive Technologies Inc.



- ### Motivation
- We aim to alleviate the problem **unnatural image generation** by StyleGANs
  - A **naturalness prior** is introduced using **pretrained feature extractor**.
  - Analyzed the impact on **smoothness of latent space** and **editing capabilities** of StyleGANs



	Gender	Smile	Age	Hair	Bangs	Beard	Mean
SG2-ADA	1.38	1.48	1.18	1.96	1.95	1.60	1.59
+ HSR	<b>1.12</b>	<b>0.99</b>	<b>1.15</b>	<b>1.87</b>	<b>1.62</b>	<b>1.16</b>	<b>1.32</b>

### Conclusion

- Self-Supervised networks exhibit strong natural priors, that can improve quality of generated images.
- We show the relationship between naturalness of images and smoothness of the latent space.
- We propose Attribute Linearity Score (ALS) to measure the linearity of the latent space wrt common facial attributes.

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