HRESVQ: HIERARCHICAL RESIDUAL VECTOR QUANTIZATION - SUPPLEMENTARY MATERIALS

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1. ALGORITHM FOR ALTERNATELY TRAINING STRATEGY

To ensure the stability of the training process and enhance performance, we propose the 'alternately training strategy'. During the training phase, we update F_{VQ} and F_{PQ} alternately. The specifics of the strategy are detailed in Algorithm 1. Note that the equations written in the algorithm are based on those in the main paper.

Algorithm 1 Alternately Training Strategy

X: the data used in the training stage.
** **Update** $F_{VQ} = \{E_{VQ}, Q_{VQ}, D_{VQ}\}$ **
1: $Z \leftarrow E_{VQ}(X)$
2: $Z_q \leftarrow Q_{VQ}(Z; C_{VQ})$
3: $\hat{X}_l \leftarrow D_{VQ}(Z_q)$
4: Calculate Equation 9
5: Backward to F_{VQ} & Update
** **Update** $F_{PQ} = \{E_{PQ}, Q_{PQ}, D_{PQ}\}$ **
1: Freeze F_{VQ}
2: $\hat{X}_l \leftarrow F_{VQ}(X)$
3: $X_r \leftarrow X - \hat{X}_l$
4: $Z_r \leftarrow E_{PQ}(X_r)$
5: $Z_{q,r} \leftarrow Q_{PQ}(Z_r)$
6: $\hat{X}_r \leftarrow D_{PQ}(Z_{q,r})$
7: Calculate Equation 10
8: Backward to F_{PQ} & Update

2. ADDITIONAL EXPERIMENTAL RESULTS

We provide additional qualitative results for FFHQ (Figure 1) and ImageNet (Figure 2).

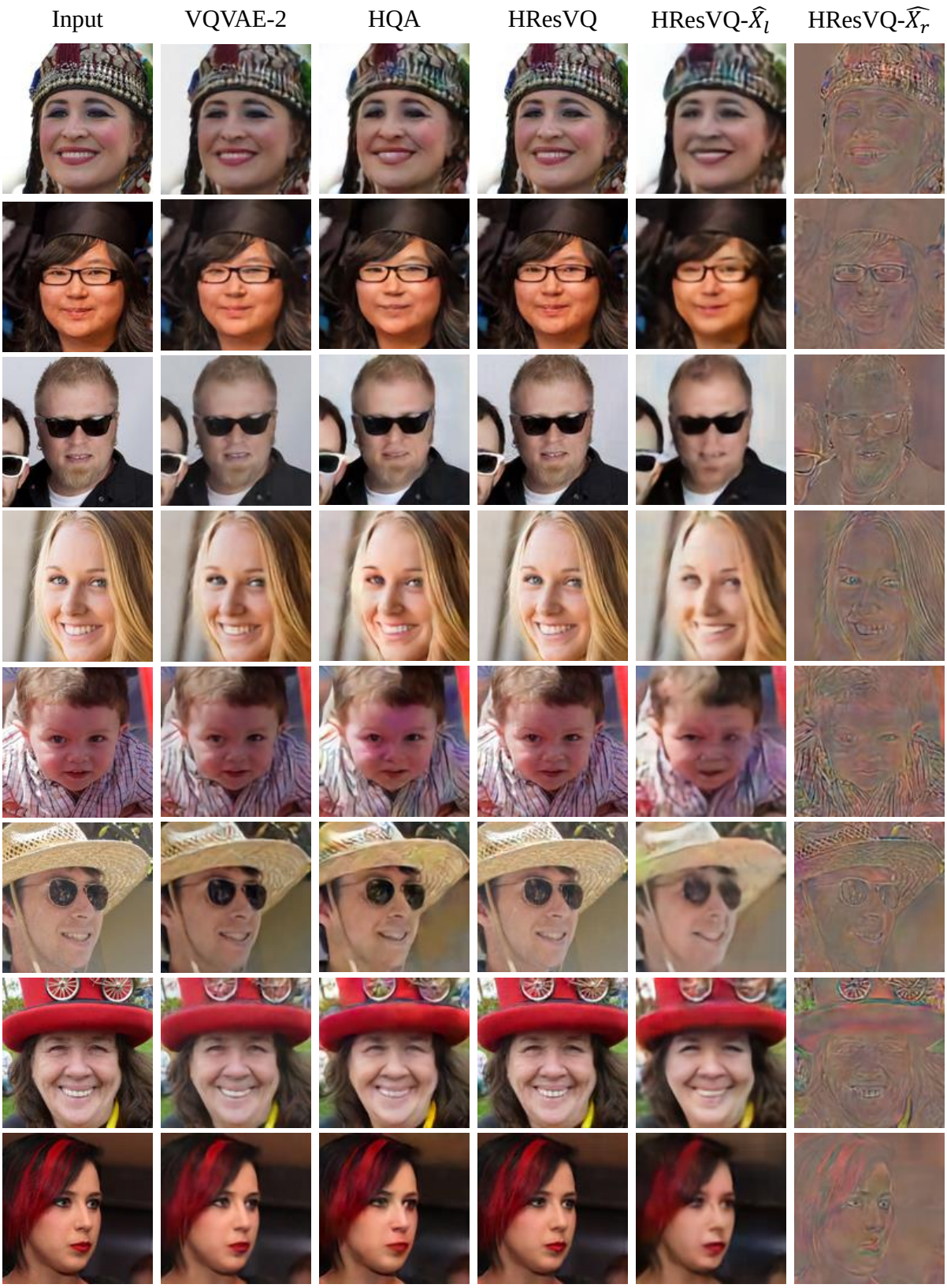

Fig. 1. Additional qualitative results for FFHQ.

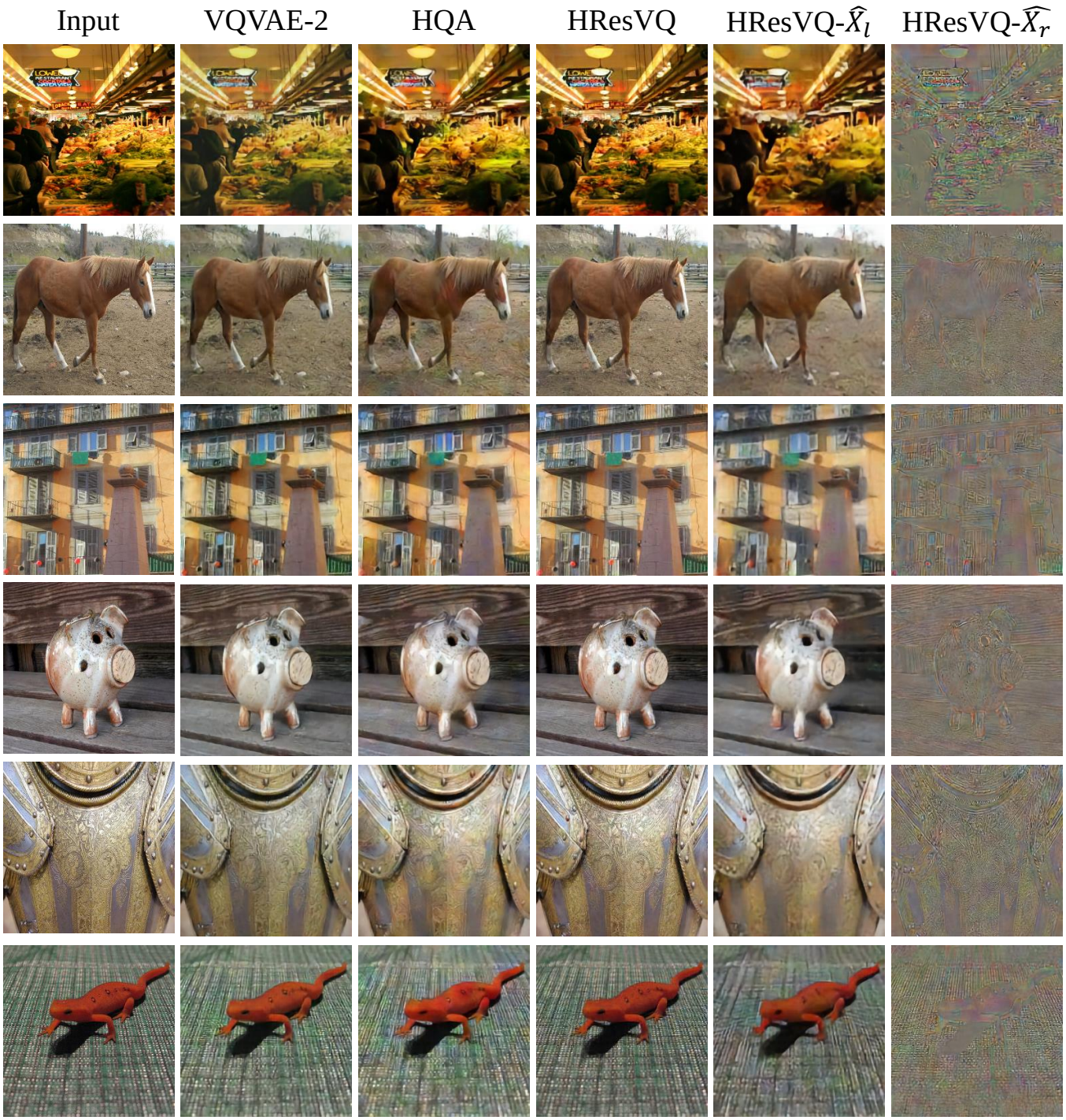

Fig. 2. Additional qualitative results for ImageNet.