

## A APPENDIX

### A.1 BOOMERANG-GENERATED IMAGES VIA THE STABLE DIFFUSION MODEL

Here we present additional images created via the Boomerang method that indicate the evolution of the predicted image as we increase  $t_{\text{Boomerang}}$ . These images are generated via the pretrained Stable Diffusion model (Rombach et al., 2022) where instead of adding noise to the image space during the forward process it is added in the latent space. Figures 5–7 showcase this where the images on the bottom row show noisy latent variables whereas the ones on the top row indicate the Boomerang predictions with increasing amounts of added noise from left to right, except for the rightmost image, which is created by using an alternate prompt.

### A.2 VANILLA BOOMERANG SUPER-RESOLUTION

Here we present the result of image super-resolution using the vanilla Boomerang approach. Figure 8 illustrates the results for image super-resolution. The top-left image in this figure shows the low-resolution image, and the top-right and bottom-left images are the result of vanilla Boomerang 8x super-resolution when using  $t_{\text{Boomerang}} = 100$  and  $t_{\text{Boomerang}} = 150$ , respectively. When compared with the high-resolution image in the bottom-right corner of Figure 8 we observe that the resulting image with  $t_{\text{Boomerang}} = 100$  is plausible while the result with  $t_{\text{Boomerang}} = 150$  seems high-resolution, but is inconsistent compared to the original image.

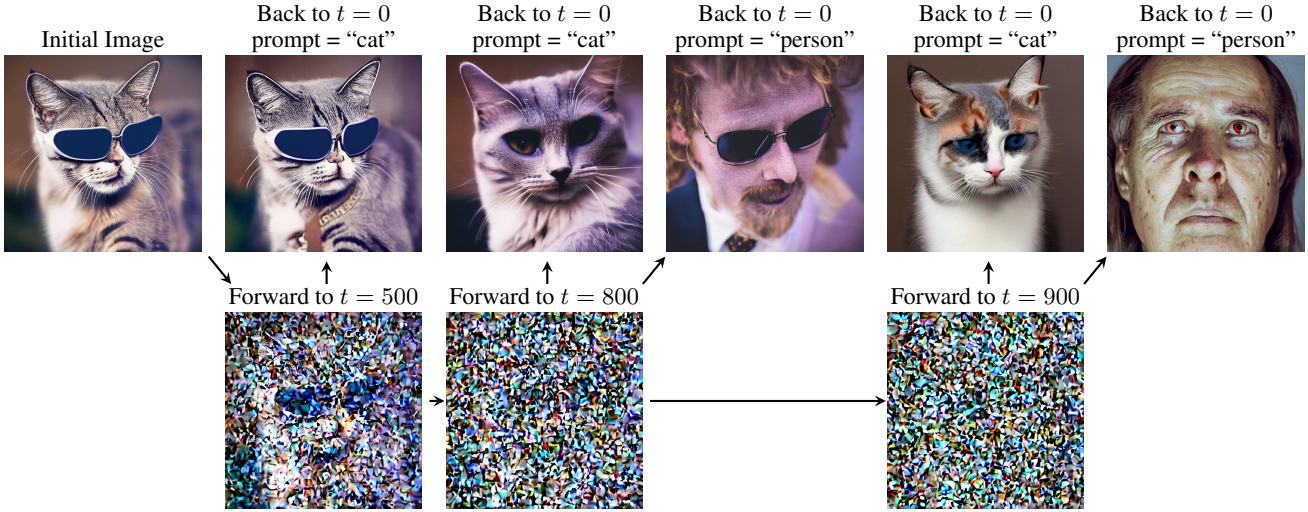


Figure 5: The Boomerang method using Stable Diffusion ( $T = 1000$ ), as in Figure 1, with an image of a cat. Note how, as  $\frac{t_{\text{Boomerang}}}{T}$  approaches 1, the content of Boomerang-generated images *strays* further away from the starting image.

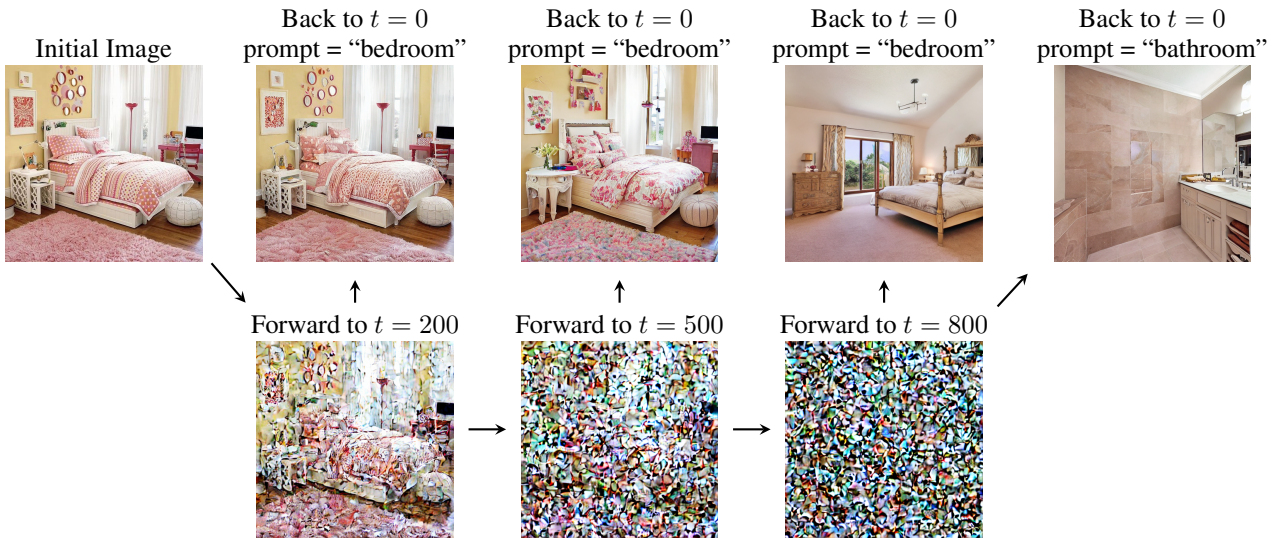


Figure 6: The Boomerang method using Stable Diffusion, as in Figure 1, with an image of a bedroom.

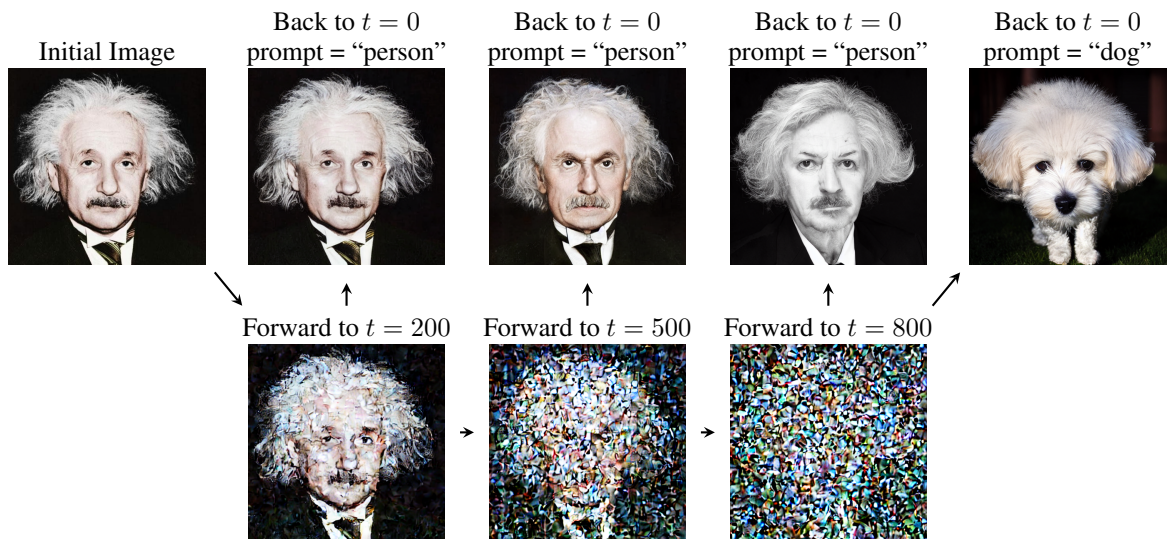


Figure 7: The Boomerang method using Stable Diffusion, as in Figure 1, with an image of Albert Einstein.



Figure 8: Vanilla super-resolution with Boomerang.