AUTOREGRESSIVE DENSITY ESTIMATION IN LATENT SPACES

by

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ABSTRACT

We propose an extension of recent autoregressive density estimation approaches such as PixelCNN and WaveNet that models the density of a latent variable space rather than the output space. In other words, we propose a model which will sequentially generate an encoded version of the output and then decode it to produce the final output. By operating over an encoded representation of the output space, we can significantly speed up the sample generation process, thus enabling higher-resolution generation in an equivalent amount of time. Our experiments show that we can obtain good quality image synthesis results in standard image datasets by applying a Variational Autoencoder to pixel blocks independently. Thus, the PixelCNN model was fed with blocks of pixels encoded in their latent space. Our approach is orthogonal to other autoregressive density estimation extensions such as the recent "parallel multiscale" approach and in the future they could ultimately be merged together.