Dreaming More Data: Class-dependent Distributions over Diffeomorphisms for Learned Data Augmentation — Supplementary Material —

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Abstract

This document contains supplementary material for the paper "Dreaming More Data: Class-dependent Distributions over Diffeomorphisms for Learned Data Augmentation" [1]. The document describes how to view the supplementary animation and shows more principal transformations than the main paper.

1 Animation

The supplementary animation (`aistats2016.mp4`) show the first three principal transformations of each class in MNIST applied to 100 images from each class. The video file should open on most platforms, but in case of problems we recommend the "VLC" player from `http://www.videolan.org/vlc/index.html`.

2 Principal Transformations

The following three figures shows the first three principal transformations applied to images from the MNIST data set.

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References

[1] S. Hauberg, O. Freifeld, A. B. L. Larsen, J. W. F. III, and L. K. Hansen. Dreaming more data: Class-dependent distributions over diffeomorphisms for learned data augmentation. In *Proceedings of the 19th international Conference on Artificial Intelligence and Statistics (AISTATS)*, volume 41, 2016.

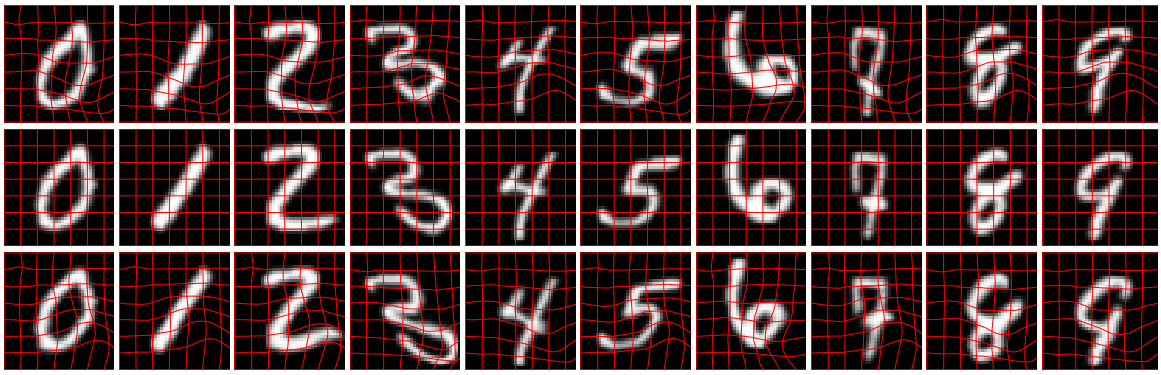

Figure 1: The first principal component of the transformations of each class. *Center row:* the mean (identity) transform. *Top row:* the mean plus 3 standard devidations. *Bottom row:* the mean minus 3 standard deviations.

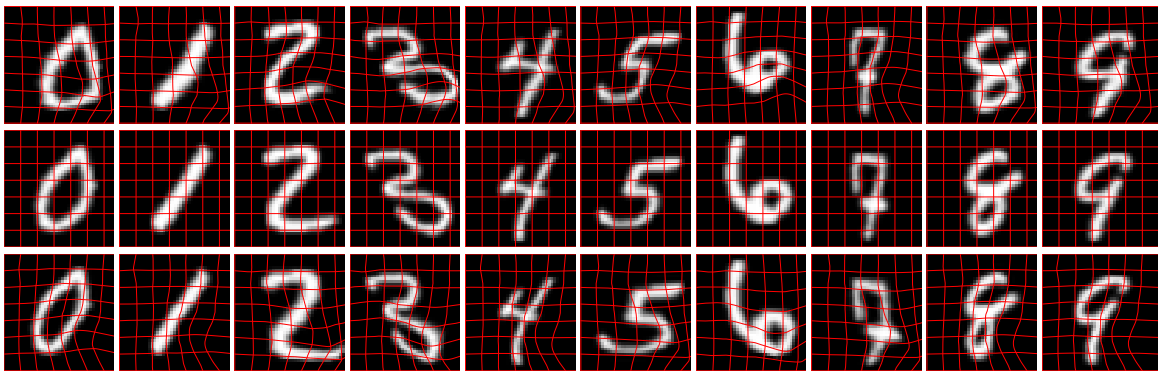

Figure 2: The second principal component of the transformations of each class. *Center row:* the mean (identity) transform. *Top row:* the mean plus 3 standard devidations. *Bottom row:* the mean minus 3 standard deviations.

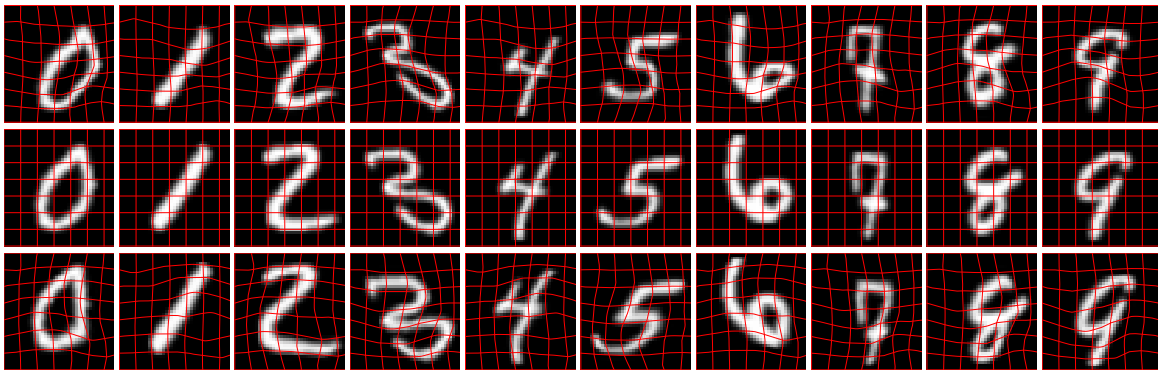

Figure 3: The third principal component of the transformations of each class. *Center row:* the mean (identity) transform. *Top row:* the mean plus 3 standard devidations. *Bottom row:* the mean minus 3 standard deviations.