Small Sample Learning GAN Implementation

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1 Visualization Results

visualization illustration in Table 1, where μ_k is the learned cluster centor for class k, $e_k = \frac{1}{n_k}\sum_{i=1}^{n_k} f_\theta(x_i)$, where x_i's label is k, $d_k = \frac{1}{n_k}\sum_{i=1}^{n_k}(\|f_\theta(x_i) - e_k\|_2)$.

Table 1: Visualization Contents Overview

(1) Davies-Bouldin Index *samller is better*	(2) Elementwise Gaussian Test *SF test, ideal is 0.05*	(3) Mean norm of $e - \mu$ *ideal is 0*
(4) Performance (Accuracy) *larger is better*	(5) Elementwise std *ideal is 1.0*	(6) Norm of e and μ *ideal is should be same*
(7) Mean dv *should smaller than 6*	(8) Correlation *ideal is 0.*	(9) Pairwise e distance *should be larger than (7)*

1.1 ProtoNet vs DVE

Gaussian Test DVE is better, and the tightness of cluster is then better, superised that there is no generalization gap between train& test gaussian test for DVE.
e**'s pairwise distance** there is a generalization gap between train& test tightness and e's pairwise distance for DVE where there is no such gap for ProtoNet

1.2 DAE's problem now

Could it learn guassian dist? Yes, it could learn gaussian distribution very well (better than DVE) (dae.pdf), but the generalization gap of e's pairwise distance is very large

- Have tried to use a larger classification loss (dae_c10)
- Have tried to use a smaller std to model the cluster (dae_s0.3)

Hardness of generalize pairwise distance
Best Perf