

Regularization

Image-level

1. Fast AutoAugment [[NIPS19](#)][[CODE](#)]: Efficient Density Matching without parameter tuning when searching, select a stack of augmentation strategies
2. AutoAugment: Learning Augmentation Strategies from Data [[CVPR19](#)][[CODE](#)]: search strategy based on RL, and RNN network as search space
3. Adversarial Learning of General Transformations for Data Augmentation [[ICLR19 workshop](#)]: using transformed image with noise to generate new adversarial samples for training, adding two more discriminators to learn the similarity and push GAN to update.
4. Cutmix for segmentation: Consistency regularization and CutMix for semi-supervised semantic segmentation [[PDF](#)]
5. ♥♥♥♥♥CutMix: Regularization Strategy to Train Strong Classifiers with Localizable Features [[PDF](#)][[CODE](#)]
6. ♥♥♥Semi-Supervised and Task-Driven Data Augmentation [[IPMI2019](#)][[CODE](#)] : using 2 GANs generates fake images
7. ♥♥♥mixup: Beyond Empirical Risk Minimization [[ICLR2018](#)][[CODE](#)]: simple combine two images and their labels
8. ♥♥♥Data augmentation using learned transforms for one-shot medical image segmentation [[CVPR2019](#)] MRI data, data augmentation wrapping, spatial and appearance transform
9. Improved Regularization of Convolutional Neural Networks with Cutout [[arxiv1708](#)][[CODE](#)]

Feature-level

1. ♥♥♥♥♥Manifold Mixup: Better Representations by

- Interpolating Hidden States [[ICML19](#)]
2. Implicit Semantic Data Augmentation for Deep Networks [[NIPS19](#)][[CODE](#)]: for classification
 3. ShakeDrop Regularization for Deep Residual Learning [[ICLR18workshop](#)][[CODE](#)]
 4. Shake-shake regularization of 3-branch residual networks [[ICLR17](#)][[CODE](#)]
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Network Regularization

1. ♥♥♥♥ Regularizing Deep Networks by Modeling and Predicting Label Structure [CVPR2018] [paper](#) code: combining hyper column feature segmentation network with auto encoder. Use encoder or decoder to regularise the segmentation network. Good paper, not work
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Normalization

1. Instance **normalization** (Improved Texture Networks: Maximizing Quality and Diversity in Feed-forward Stylization and Texture Synthesis) [[CVPR 2017](#)][[CODE](#)]:
2. Group normalisation [[arxiv2018](#)][[CODE](#)]:
3. ♥♥♥♥♥ Adaptive Affinity Fields [[ECCV 2018](#)][[CODE](#)]: loss function, segmentation, relationship in neighbors [separate or group]
4. ♥♥♥♥♥ Dilated Residual Networks [[CVPR2017](#)][[CODE](#)pytorch]
5. ♥♥♥♥♥ Weight Standardization [[arxiv1903](#)][[CODE](#)]: especially for batch size =1 or 2