

Least Squares Generative Adversarial Networks

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ABSTRACT

Unsupervised learning with generative adversarial networks (GANs) has proven hugely successful. Regular GANs hypothesize the discriminator as a classifier with the sigmoid cross entropy loss function. However, we found that this loss function may lead to the vanishing gradients problem during the learning process. To overcome such a problem, we propose in this paper the Least Squares Generative Adversarial Networks (LSGANs) which adopt the least squares loss function for the discriminator. We show that minimizing the objective function of LSGAN yields minimizing the Pearson χ^2 divergence. There are two benefits of LSGANs over regular GANs. Firstly, LSGANs are able to generate higher quality images than regular GANs. Secondly, LSGANs perform more stable during the learning process. We evaluate LSGANs on LSUN and CIFAR-10 datasets and the experimental results show that the images generated by LSGANs are of better quality than the ones generated by regular GANs. We also conduct two comparison experiments between LSGANs and regular GANs to illustrate the stability of LSGANs.

This paper will be presented at the 2017 IEEE International Conference on Computer Vision (ICCV), Venice, Italy, October 22-29, 2017.

Supervisor: Prof LI Qing

Research Interests: Generative Adversarial Networks (GANs) and Unsupervised Learning

All are welcome!



In case of questions, please contact Prof LI Qing at Tel: 3442 9695, E-mail: ltqli@cityu.edu.hk, or visit the CS Departmental Seminar Web at <http://www.cs.cityu.edu.hk/news/seminars/seminars.html>.

