# 《神经网络基础》课程作业

## 项目 1：论文阅读

查阅近年来关于深度神经网络的经典文献进行研读。数量不少于 10 篇。

项目人数：个人完成。

作业提交形式：非必需。形式任意，比如可以写一篇深度卷积神经网络应用综述。

推荐文献：

Krizhevsky A, Sutskever I, Hinton G E. Imagenet classification with deep convolutional neural networks[C]//Advances in neural information processing systems. 2012: 1097-1105.

He K, Zhang X, Ren S, et al. Delving deep into rectifiers: Surpassing human-level performance on imagenet classification[C]//Proceedings of the IEEE international conference on computer vision. 2015: 1026-1034.

Ioffe S, Szegedy C. Batch normalization: Accelerating deep network training by reducing internal covariate shift[C]//International Conference on Machine Learning. 2015: 448-456.

Hubara I, Courbariaux M, Soudry D, et al. Quantized neural networks: Training neural networks with low precision weights and activations[J]. arXiv preprint arXiv:1609.07061, 2016.

Rastegari M, Ordonez V, Redmon J, et al. Xnor-net: Imagenet classification using binary convolutional neural networks[C]//European Conference on Computer Vision. Springer International Publishing, 2016: 525-542.

He K, Zhang X, Ren S, et al. Spatial pyramid pooling in deep convolutional networks for visual recognition[C]//European Conference on Computer Vision. Springer, Cham, 2014: 346-361.

He K, Zhang X, Ren S, et al. Deep residual learning for image recognition[C]//Proceedings of the IEEE conference on computer vision and pattern recognition. 2016: 770-778.

He K, Zhang X, Ren S, et al. Identity mappings in deep residual networks[C]//European Conference on Computer Vision. Springer International Publishing, 2016: 630-645.

Srivastava R K, Greff K, Schmidhuber J. Highway networks[J]. arXiv preprint arXiv:1505.00387, 2015.

Simonyan K, Zisserman A. Very deep convolutional networks for large-scale image recognition[J]. arXiv preprint arXiv:1409.1556, 2014.

Szegedy C, Liu W, Jia Y, et al. Going deeper with convolutions[C]//Proceedings of the IEEE conference on computer vision and pattern recognition. 2015: 1-9.

Carreira J, Madeira H, Silva J G. Xception: A technique for the experimental evaluation of dependability in modern computers[J]. IEEE Transactions on Software Engineering, 1998, 24(2): 125-136.

Xie S, Girshick R, Dollár P, et al. Aggregated residual transformations for deep neural networks[J]. arXiv preprint arXiv:1611.05431, 2016.

Long J, Shelhamer E, Darrell T. Fully convolutional networks for semantic segmentation[C]//Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition. 2015: 3431-3440.

Girshick R, Donahue J, Darrell T, et al. Rich feature hierarchies for accurate object detection and semantic segmentation[C]//Proceedings of the IEEE conference on computer vision and pattern recognition. 2014: 580-587.

Ren S, He K, Girshick R, et al. Faster R-CNN: Towards real-time object detection with region proposal networks[C]//Advances in neural information processing systems. 2015: 91-99.

Long J, Shelhamer E, Darrell T. Fully convolutional networks for semantic segmentation[C]//Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition. 2015: 3431-3440.

Dai J, Li Y, He K, et al. R-fcn: Object detection via region-based fully convolutional networks[C]//Advances in neural information processing systems. 2016: 379-387.

Lin T Y, RoyChowdhury A, Maji S. Bilinear cnn models for fine-grained visual recognition[C]//Proceedings of the IEEE International Conference on Computer Vision. 2015: 1449-1457.

He K, Gkioxari G, Dollár P, et al. Mask r-cnn[J]. arXiv preprint arXiv:1703.06870, 2017.

Goodfellow I, Pouget-Abadie J, Mirza M, et al. Generative adversarial nets[C]//Advances in neural information processing systems. 2014: 2672-2680.

## 项目 2：Neural style transfer

查阅近年来使用神经网络进行 style transfer 的文献资料，了解该任务的定义、常用方法及其原理等。并尝试编程复现其中一种方法。可以参考如下资料：

Jing Y, Yang Y, Feng Z, et al. Neural Style Transfer: A Review[J]. arXiv preprint arXiv:1705.04058, 2017.

项目人数：个人完成

作业提交形式：撰写研究报告。内容需包括：

1）Neural style transfer 的问题定义、现有方法的思路归类等。

2）选择一种现有的方法，详细介绍其方法原理和算法流程。如果你有创新或改进思路，请特别指出。

3）编程实现所选的方法。可以参考相关的开源项目。注意程序细节无需体现在报告中。报告中只需介绍所采用的模型、训练框架、输入输出、结果截图等。请明确区分自己和他人的成果。