## A Summary Table

| Year | CNN | Developed by | Place | Top-5 error rate | No. of parameters |
|---|---|---|---|---|---|
| 1998 | LeNet(8) | Yann LeCun et al | | | 60 thousand |
| 2012 | AlexNet(7) | Alex Krizhevsky, Geoffrey Hinton, Ilya Sutskever | 1st | 15.3% | 60 million |
| 2013 | ZFNet() | Matthew Zeiler and Rob Fergus | 1st | 14.8% | |
| 2014 | GoogLeNet(19) | Google | 1st | 6.67% | 4 million |
| 2014 | VGG Net(16) | Simonyan, Zisserman | 2nd | 7.3% | 138 million |
| 2015 | ResNet(152) | Kaiming He | 1st | 3.6% | |

# 3.10 GPU Implementations

In the year 2005 paper that established the value of GPGPU for machine learning, several publications described more efficient ways to train convolutional neural networks using GPUs. In 2011, they were refined and implemented on a GPU, with impressive results. In 2012, Ciresan et al. significantly improved on the best performance in the literature for multiple image databases, including the MNIST (Modified National Institute of Standards and Technology database) database, the NORB database, the HWDB1.0 dataset (Chinese characters), the CIFAR10 dataset (dataset of 60000 32x32 labeled RGB images), and the ImageNet dataset.