

Neural Networks: 1986-2012

Rumelhart et al.
Nature paper

Hochreiter & Schmidhuber
Long-term memory

Hinton - Pre-training
breakthrough

ImageNet victory
Deep Learning era begins

Backprop Paper

LSTM

Deep Belief Networks

AlexNet

1985

1990

1995

2000

2005

2010

**Cybenko
Universal Approx.**

MLP can approximate
any function

LeNet-5

Key Turning Points:
- 1986: Backpropagation makes training practical
- 2006: Deep pre-training solves vanishing gradients
- 2012: GPUs + Big Data + Deep Networks = Revolution

GPU Training

Raina et al.
100x speedup

Connectionism Era

Second AI Winter

Deep Learning Revival