Use case : Handwriting Recognition

- Used 1st to automate letter assignment based on pin code by the US Postal Service
- First step in analyzing documents like
  - medical diagnostic results (**M-Scribe, Foxtrot, CAT**)
  - bills/receipts (**ZOHO Documents, MagicBot**)
  - legal documents (**LawGeek**)
- Handwritten notes can be digitized – **MyScript** uses Neural Networks
- Seamless digitization and solving of equations written on tablet – **MyScript Calculator**
- Interactive learning by converting black boards into sharable digital formats
- Digitizing books to store for posterity – **Google Books**

MNIST Dataset

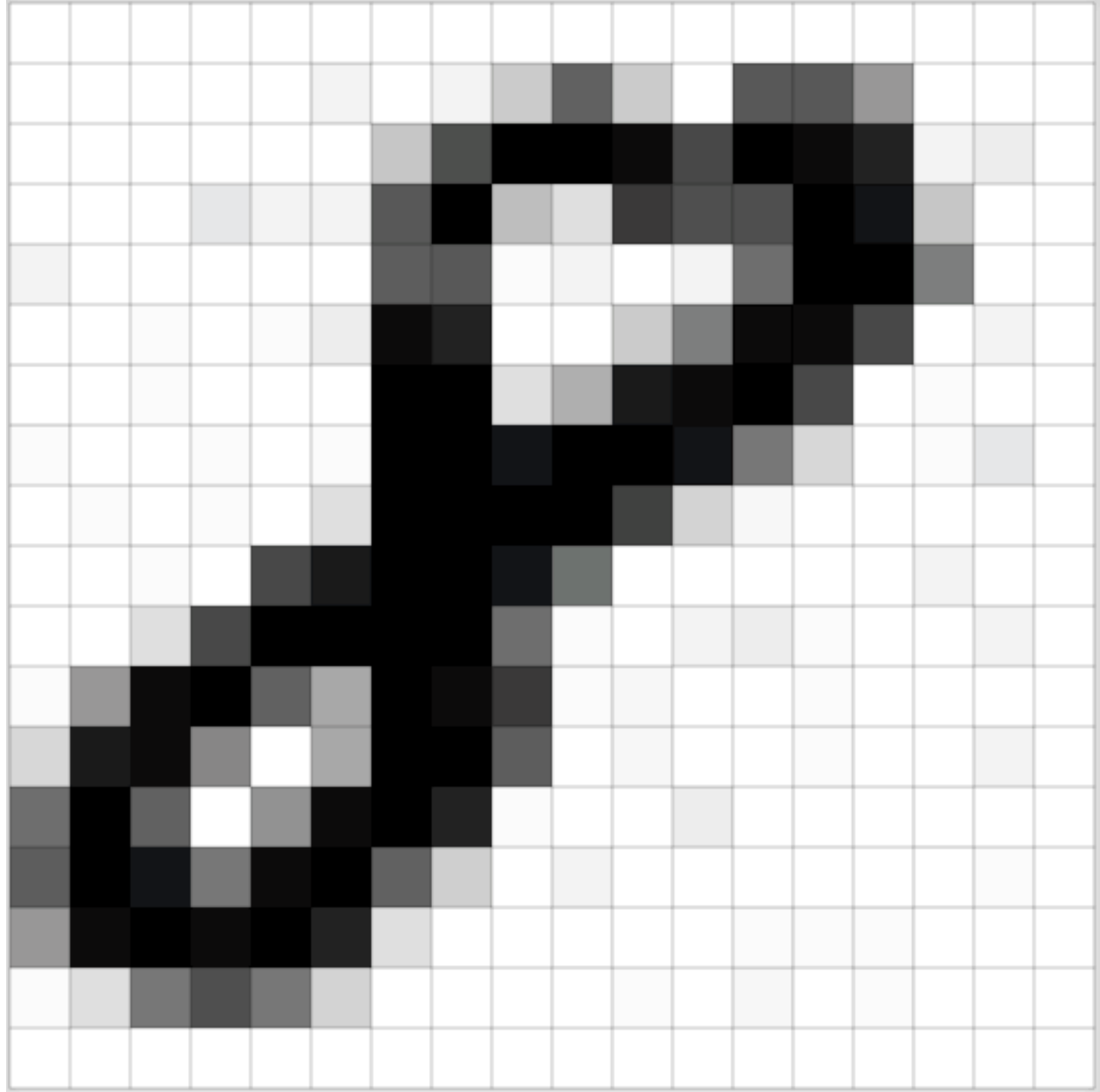
70,000 Images of Handwritten Digits

Every Image is a 28x28 pixel image

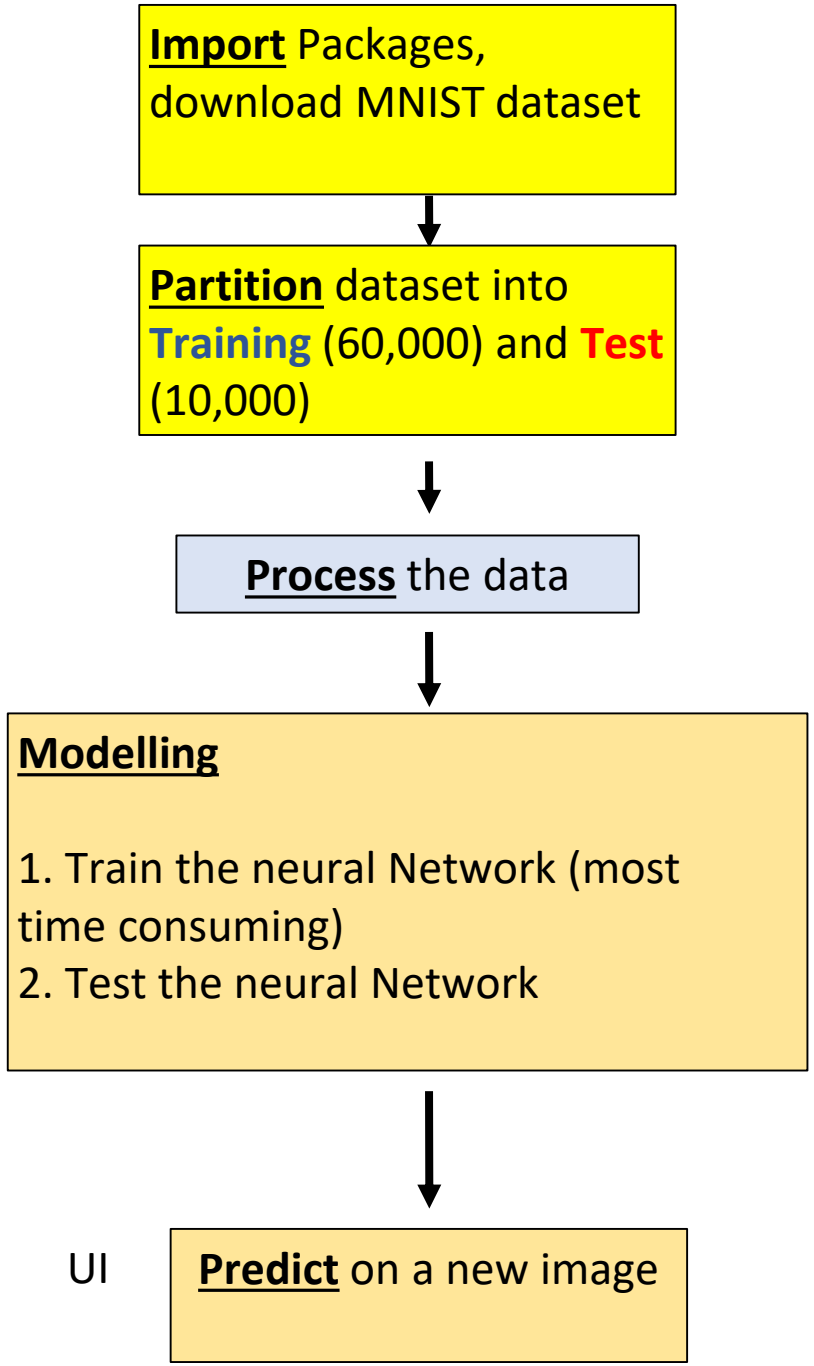
Prepared by Yann LeCun, Corinna Cortes and Chris Burges.

Handwritten Digit Recognition

Using shallow neural networks on the MNIST dataset



Artificial Neural Nets (ANNs)

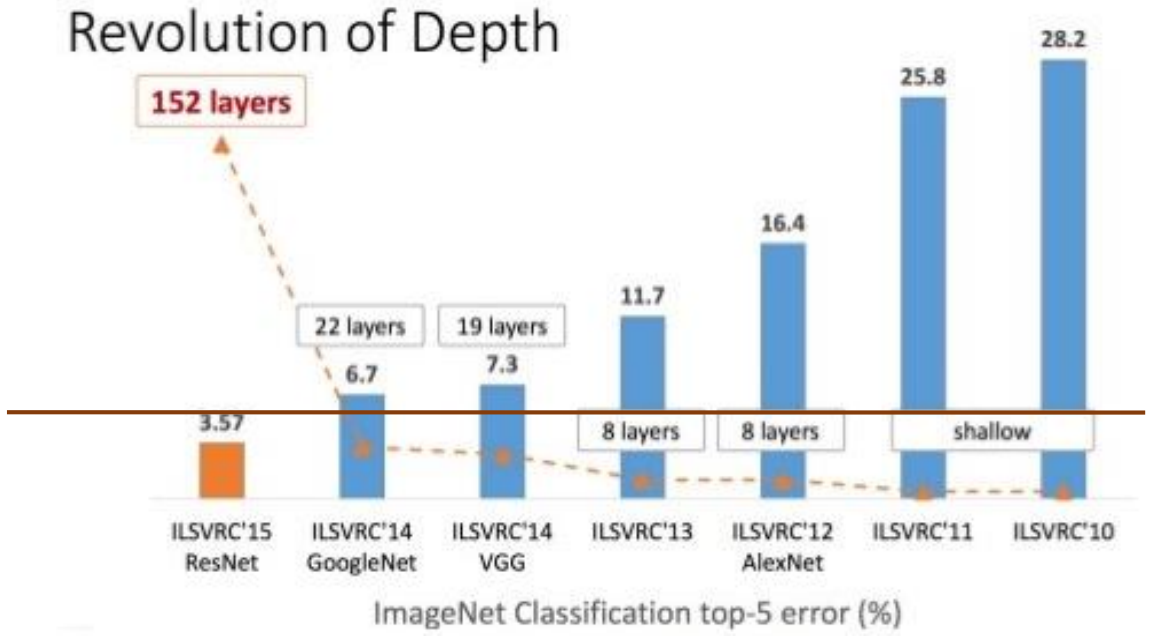


A Complex Neural Net

For better prediction accuracy

Convolutional Neural Nets

- Developed for image analysis
- The annual competition **Imagenet** puts to challenge different image analysis models
- CNNs have been dominating the challenge since **2012**
- Highly developed CNNs have now superseded humans in image classification !!!



= Human classification error rate = 5.1%

Convolutional Neural Nets (CNNs)