Gradient-Based Learning Applied to Document Recognition (Pass 1)

Convolutional neural networks: invented by Yann LeCun, circa 2000

Useful links:

Category: What type of paper is this?

Review of various methods applied to handwritten character recognition

Context: What is it related to?

- Convolutional neural networks, Graph transformer network
- Machine learning, Neural networks, Gradient-based learning
- Document recognition, Optical character recognition
- Finite state transducers

Correctness: Do the assumptions appear to be valid?

- Allowing more reliance on automatic learning and less on detailed engineering is good. Yes, overall performance improvements is the entire point.
- "better pattern recognition systems can be built by relying more on automatic learning and less on hand-designed heuristics." Machine Learning is not worthless, cool.
- It is almost impossible to build an accurate recognition system entirely by hand. Hand-crafted algorithms are lame.

Contributions: What are the paper's main contributions?

- Introduces the MNIST database (Modified National Institute of Standards and Technology database), a large collection of handwritten digits.
- Provides a review of systems: "Convolutional NN's have been shown to eliminate the need for hand-crafted feature extractors. GTN's have been shown to reduce the need for hand-crafted heuristics, manual labeling, and manual parameter tuning in document recognition systems."
- Provides a detailed overview of Machine Learning and Recognition Systems

Clarity: Is the paper well written?

I love "NOMENCLATURE"

Gradient-Based Learning Applied to Document Recognition (Pass 2)

Convolutional neural networks: invented by Yann LeCun, circa 2000