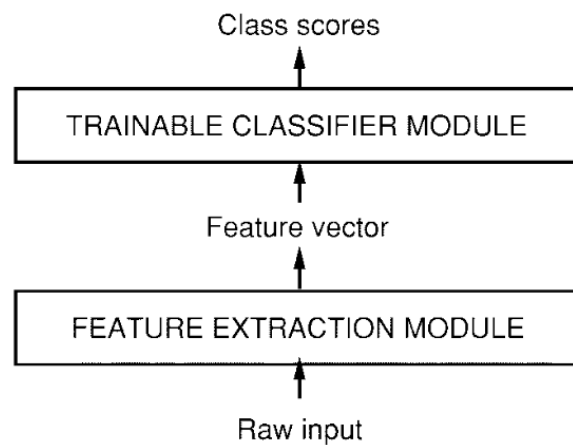


Digit Recognition and Data Curation

Michael Wollowski

Image sources: Gradient-Based Learning Applied to Document Recognition
by Yann LeCun, Leon Bottou, Yoshua Bengio, and Patrick Haffner

Pattern Recognition



Data Curation

- Size normalization
- Positioning in center of image

3 6 8 1 7 9 6 6 9 1
 6 7 5 7 8 6 3 4 8 5
 2 1 7 9 7 1 2 8 4 5
 4 8 1 9 0 1 8 8 9 4
 7 6 1 8 6 4 1 5 6 0
 7 5 9 2 6 5 8 1 9 7
 2 2 2 2 2 3 4 4 8 0
 0 2 3 8 0 7 3 8 5 7
 0 1 4 6 4 6 0 2 4 3
 7 1 2 8 7 6 9 8 6 1

Performance Evaluation

- Examples of distortions of ten training patterns.

0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

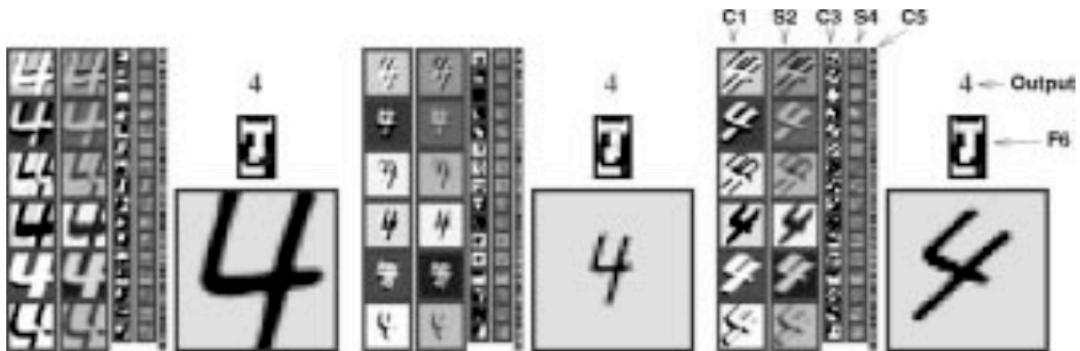
Performance Evaluation

- Test patterns misclassified by LeNet-5.



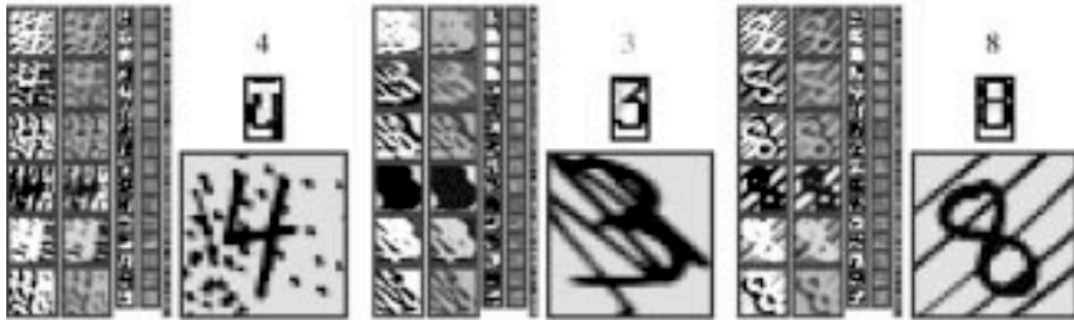
Performance Evaluation

- Unusual, distorted, and noisy characters correctly recognized by LeNet-5



Performance Evaluation

- Unusual, distorted, and noisy characters correctly recognized by LeNet-5



Performance Evaluation

- Unusual, distorted, and noisy characters correctly recognized by LeNet-5

