Review: ImageNet Classification with Deep Convolutional Neural Networks

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Explore Non-Linearities

The activation functions explored:relu, tanh, abs(tanh) and sigmoid. As expected relu takes shorter time to achieve the same level of accuracy on MNIT data.

- abs(tanh) - Time usage: 0:06:41, Accuracy on Test-Set: 98.7% (9867 / 10000)
- relu - Time usage: 0:06:32, Accuracy on Test-Set: 98.7% (9866 / 10000)
- tanh - Time usage: 0:06:37, Accuracy on Test-Set: 98.9% (9887 / 10000)
- sigmoid - Time usage: 0:06:30, Accuracy on Test-Set: 96.5% (9652 / 10000)

```r
x <- seq(from = -40, to = 40, by = 0.01)

sig <- 1 / (1 + exp(-x))
hinge <- function(a) {
  return(max(0, a))
}
relu <- unlist(lapply(x, hinge))

plot(x,
     relu,
     type = 'l',
     ylab = '')
lines(x, sig , col = 'red')
lines(x, tanh(x), col = 'green')
lines(x, abs(tanh(x)), col = 'blue')
```