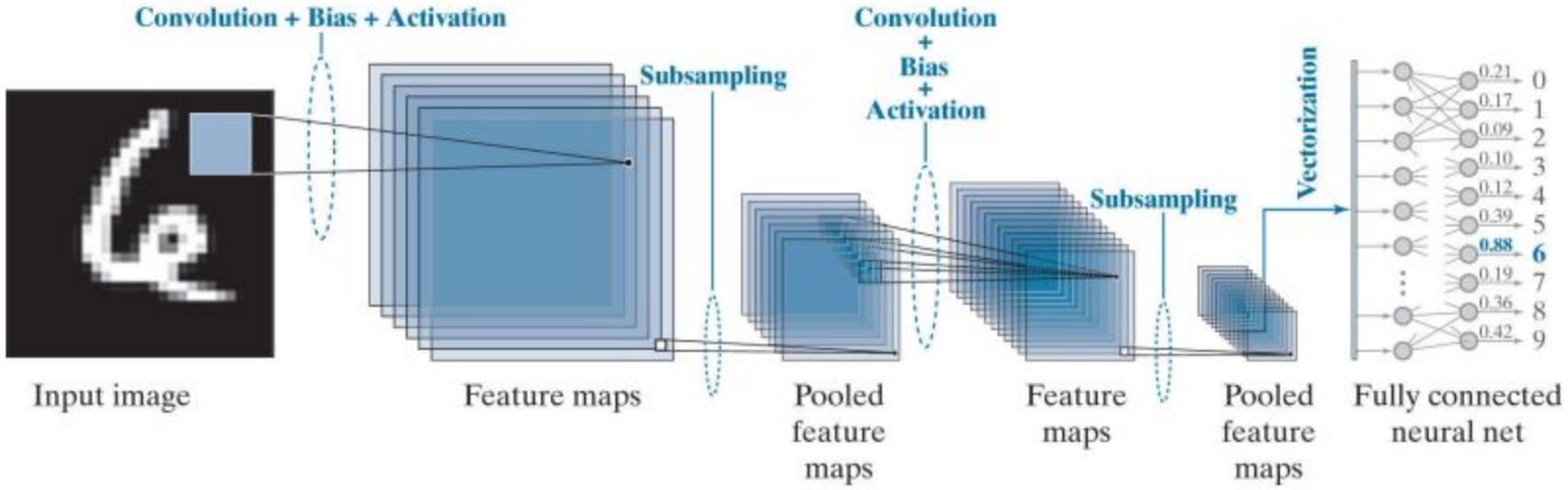
Classificação com Redes Convolucionais

LENET-5

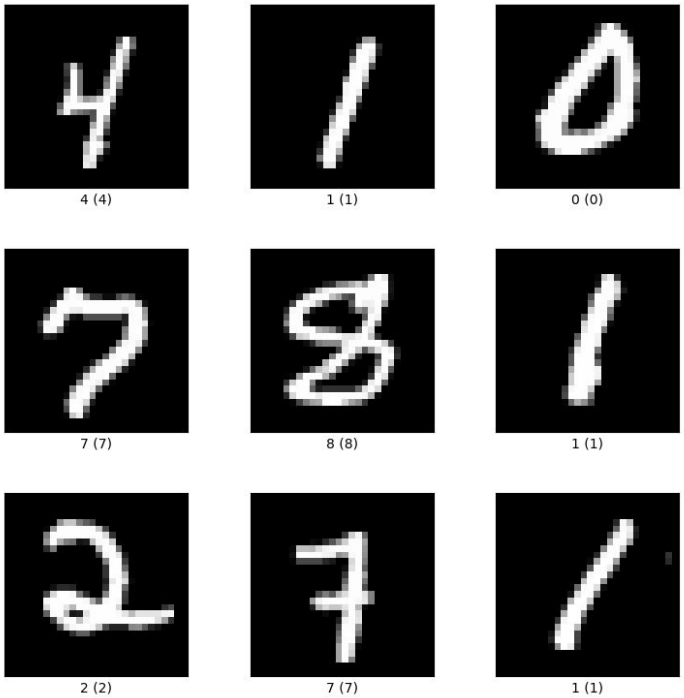
Diagrama - Funcionamento da Rede



Passos LENET

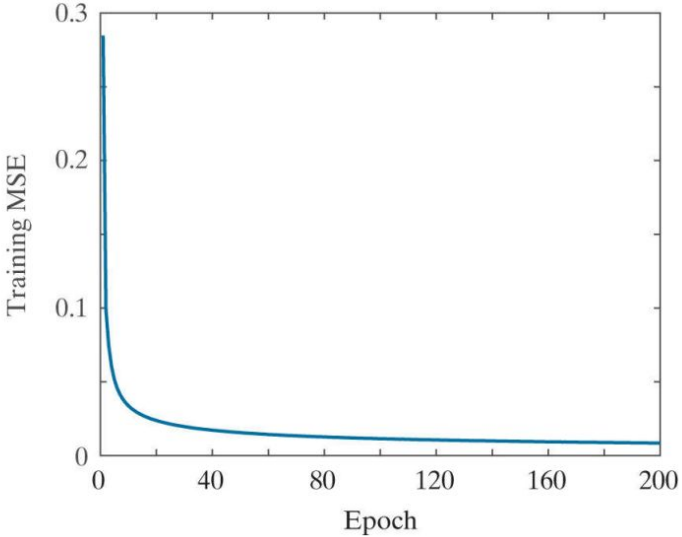
Step	Description	Equations
Step 1	Input images	$a(0) =$ the set of image pixels in the input to layer 1
Step 2	Forward pass	For each neuron corresponding to location (x, y) in each feature map in layer ℓ compute: $z_{x,y}(\ell) = w(\ell) \star a_{x,y}(\ell - 1) + b(\ell)$ and $a_{x,y}(\ell) = h(z_{x,y}(\ell)); \ \ell = 1, 2, ..., L_c$
Step 3	Backpropagation	For each neuron in each feature map in layer ℓ compute: $\delta_{x,y}(\ell) = h'(z_{x,y}(\ell))[\delta_{x,y}(\ell + 1) \star \text{rot180}(w(\ell + 1))]; \ \ell = L_c - 1, L_c - 2, ..., 1$
Step 4	Update parameters	Update the weights and bias for each feature map using $w_{l,k}(\ell) = w_{l,k}(\ell) - \alpha\delta_{l,k}(\ell) \star \text{rot180}(a(\ell - 1))$ and $b(\ell) = b(\ell) - \alpha \sum_x \sum_y \delta_{x,y}(\ell); \ \ell = 1, 2, ..., L_c$

Dataset MNIST

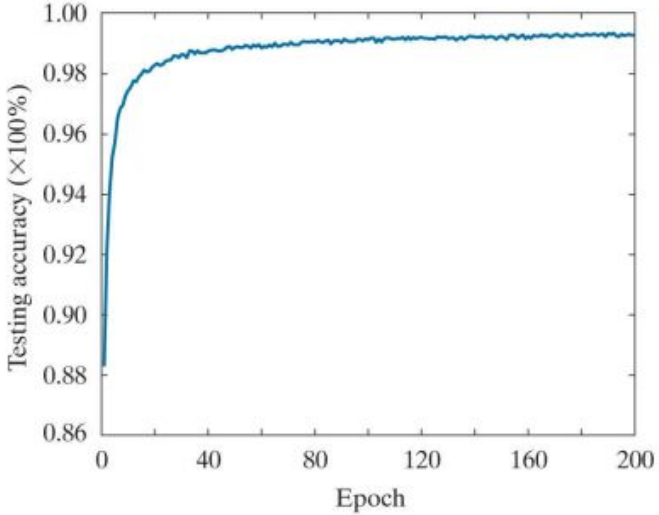


Resultados Gonzales

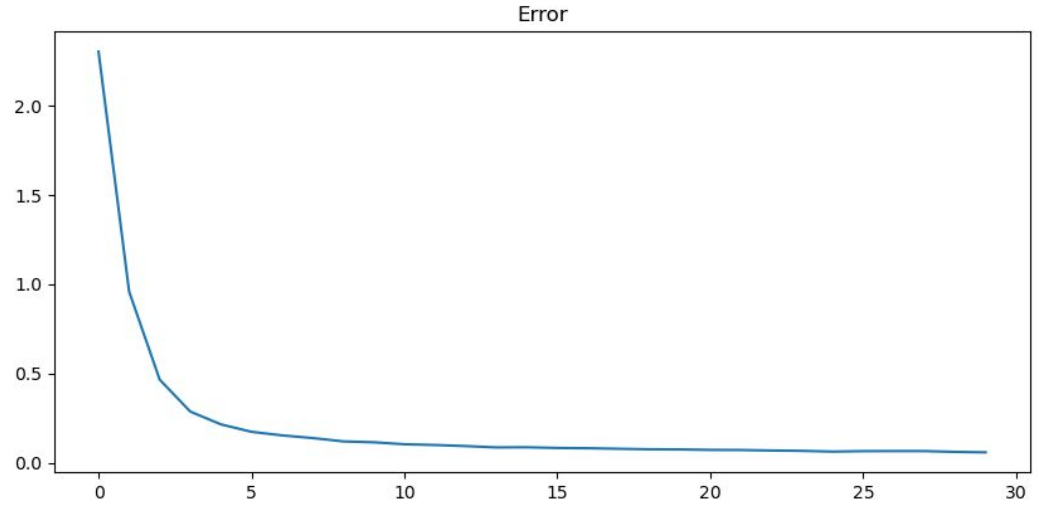
Error

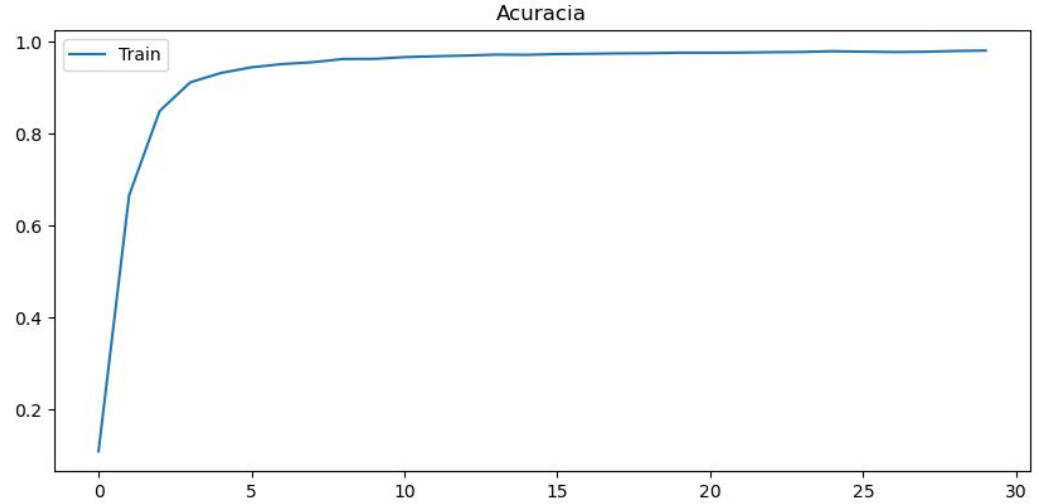


Acurácia



Resultados RELU





Resultados RELU