

Machine Learning

Neural Networks: Representation

Multi-class classification

reconhecer dígitos tbm é um exemplo

tentar reconhecer 4

categorias objectos

Multiple output units: **One-vs-all.**



Pedestrian



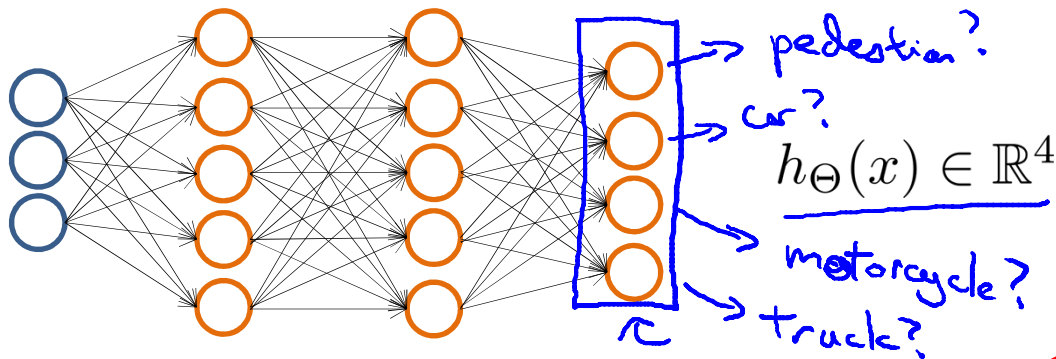
Car



Motorcycle



Truck



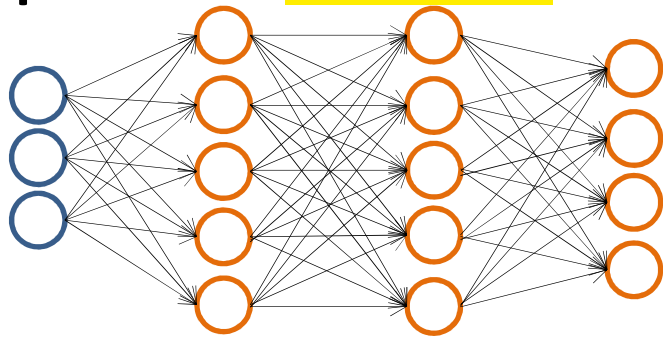
fazemos output
de 4 resultados

Want $h_{\Theta}(x) \approx \begin{bmatrix} 1 \\ 0 \\ 0 \\ 0 \end{bmatrix}$,
when pedestrian

$h_{\Theta}(x) \approx \begin{bmatrix} 0 \\ 1 \\ 0 \\ 0 \end{bmatrix}$,
when car

$h_{\Theta}(x) \approx \begin{bmatrix} 0 \\ 0 \\ 1 \\ 0 \end{bmatrix}$, etc.
when motorcycle

Multiple output units: **One-vs-all.**



$$h_{\Theta}(x) \in \mathbb{R}^4$$

Want $h_{\Theta}(x) \approx \begin{bmatrix} 1 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, $h_{\Theta}(x) \approx \begin{bmatrix} 0 \\ 1 \\ 0 \\ 0 \end{bmatrix}$, $h_{\Theta}(x) \approx \begin{bmatrix} 0 \\ 0 \\ 1 \\ 0 \end{bmatrix}$, etc.
 when pedestrian when car when motorcycle

Training set: $(x^{(1)}, y^{(1)}), (x^{(2)}, y^{(2)}), \dots, (x^{(m)}, y^{(m)})$

$\Rightarrow y^{(i)}$ one of $\begin{bmatrix} 1 \\ 0 \\ 0 \\ 0 \end{bmatrix}$, $\begin{bmatrix} 0 \\ 1 \\ 0 \\ 0 \end{bmatrix}$, $\begin{bmatrix} 0 \\ 0 \\ 1 \\ 0 \end{bmatrix}$, $\begin{bmatrix} 0 \\ 0 \\ 0 \\ 1 \end{bmatrix}$
 pedestrian car motorcycle truck

representa
imagem

$(x^{(i)}, y^{(i)})$

~~Previously~~
 $y \in \{1, 2, 3, 4\}$

$$\frac{h_{\Theta}(x^{(i)}) \approx y^{(i)}}{\mathbb{R}^4}$$

