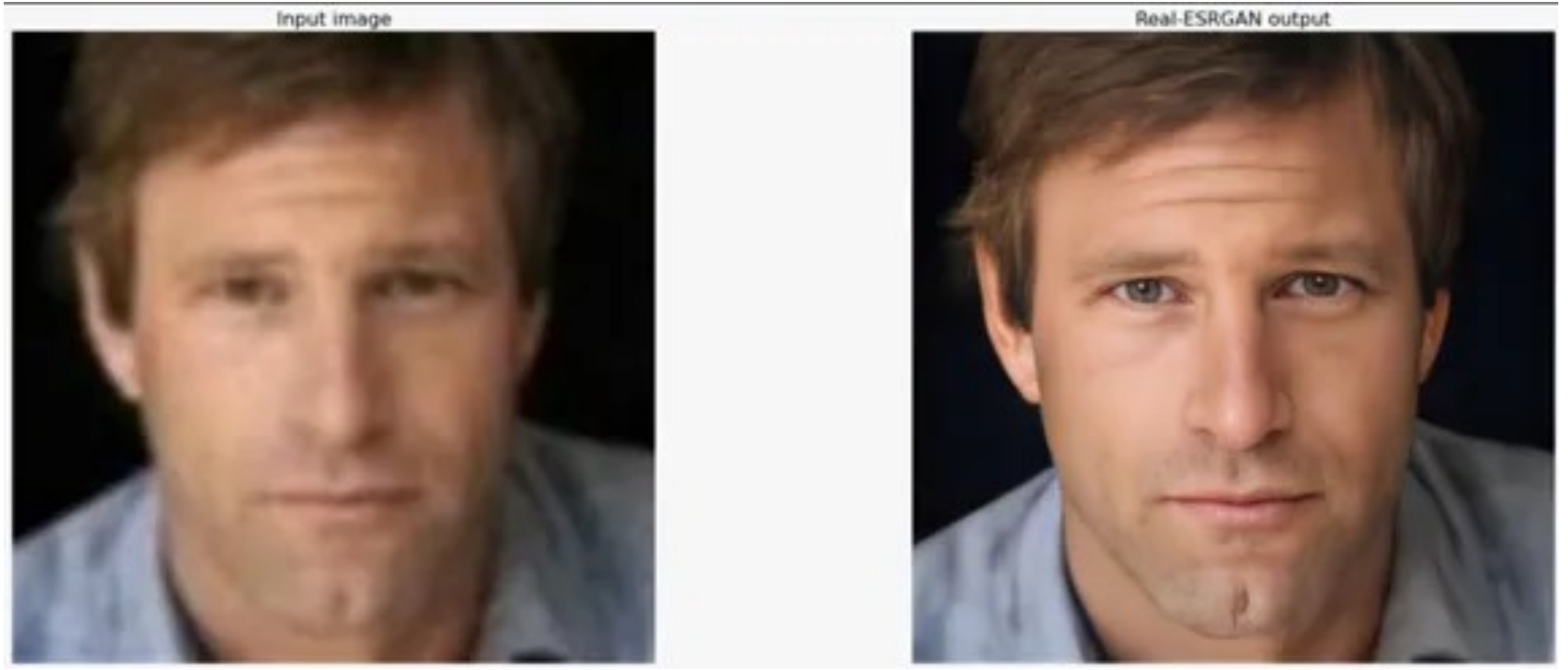
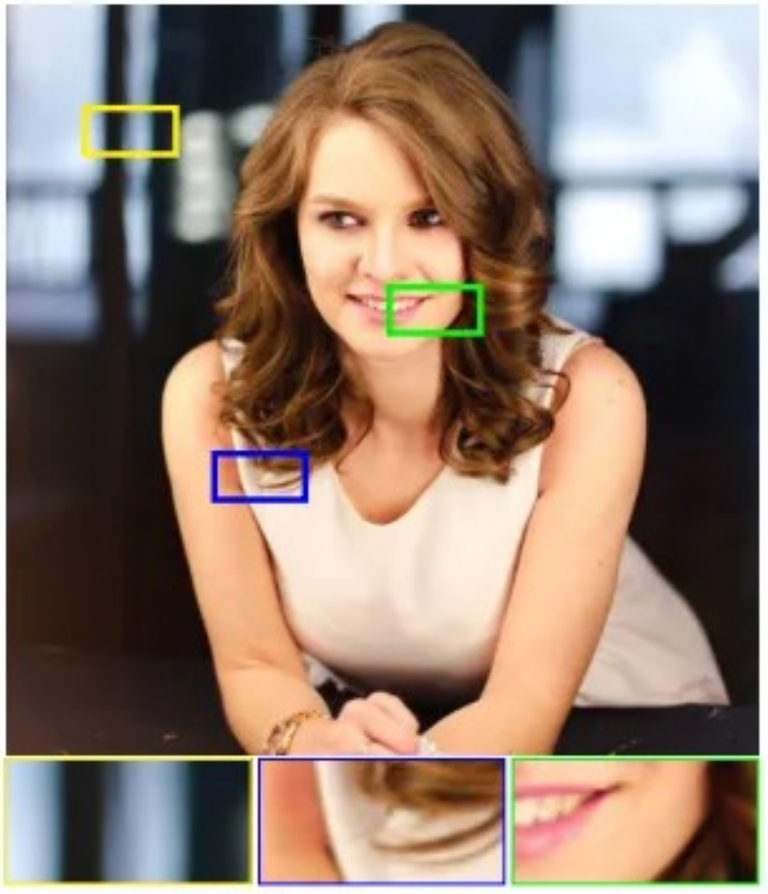
Redes Convolucionales

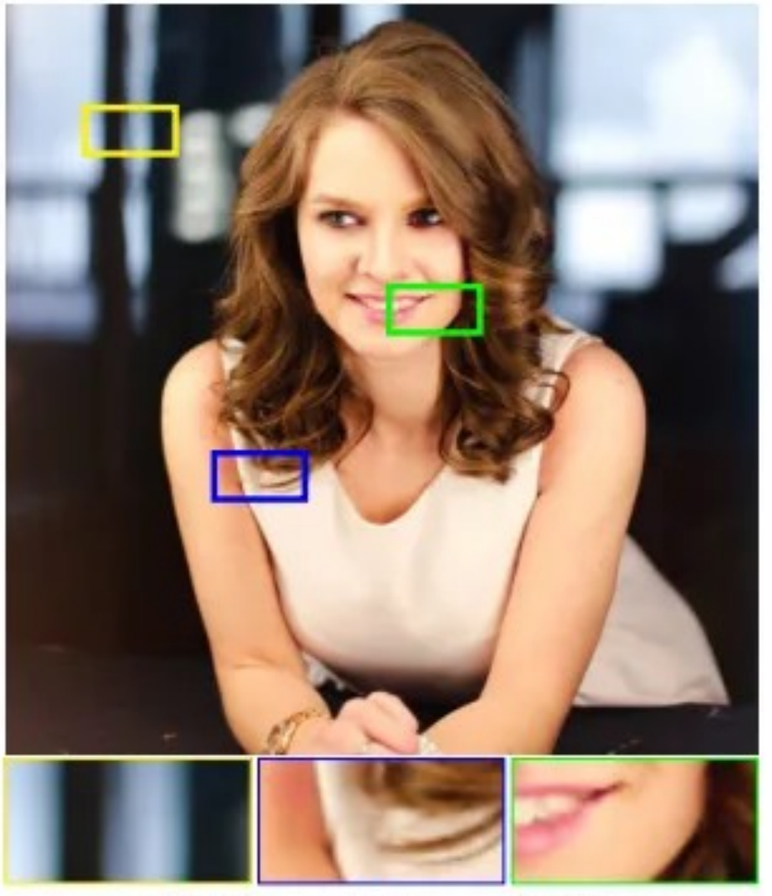
Dr. Alejandro Veloz


Input image
Real-ESRGAN output



(a) Original image

(b) Corrupted image

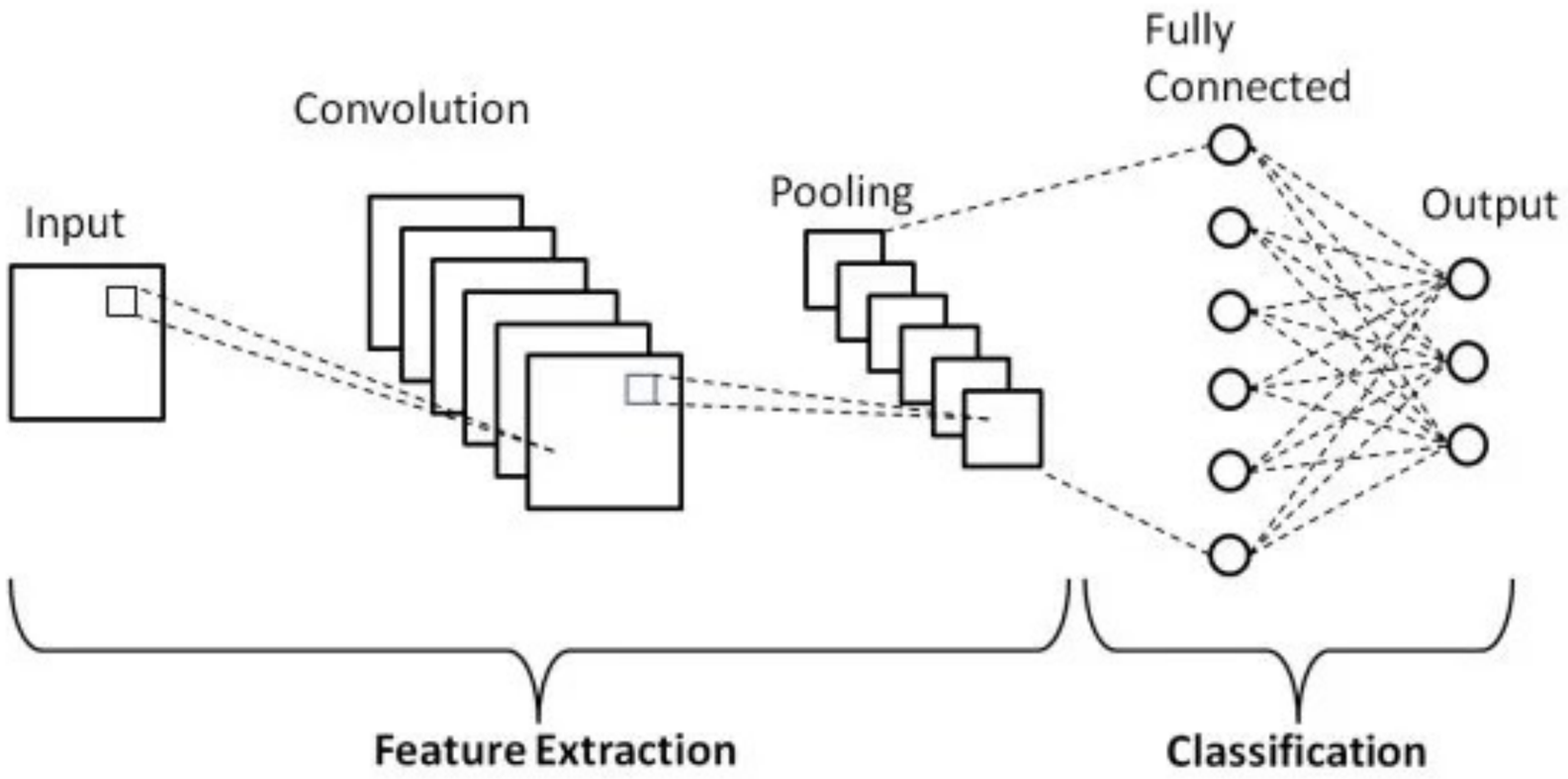


(d) Deep Image Prior

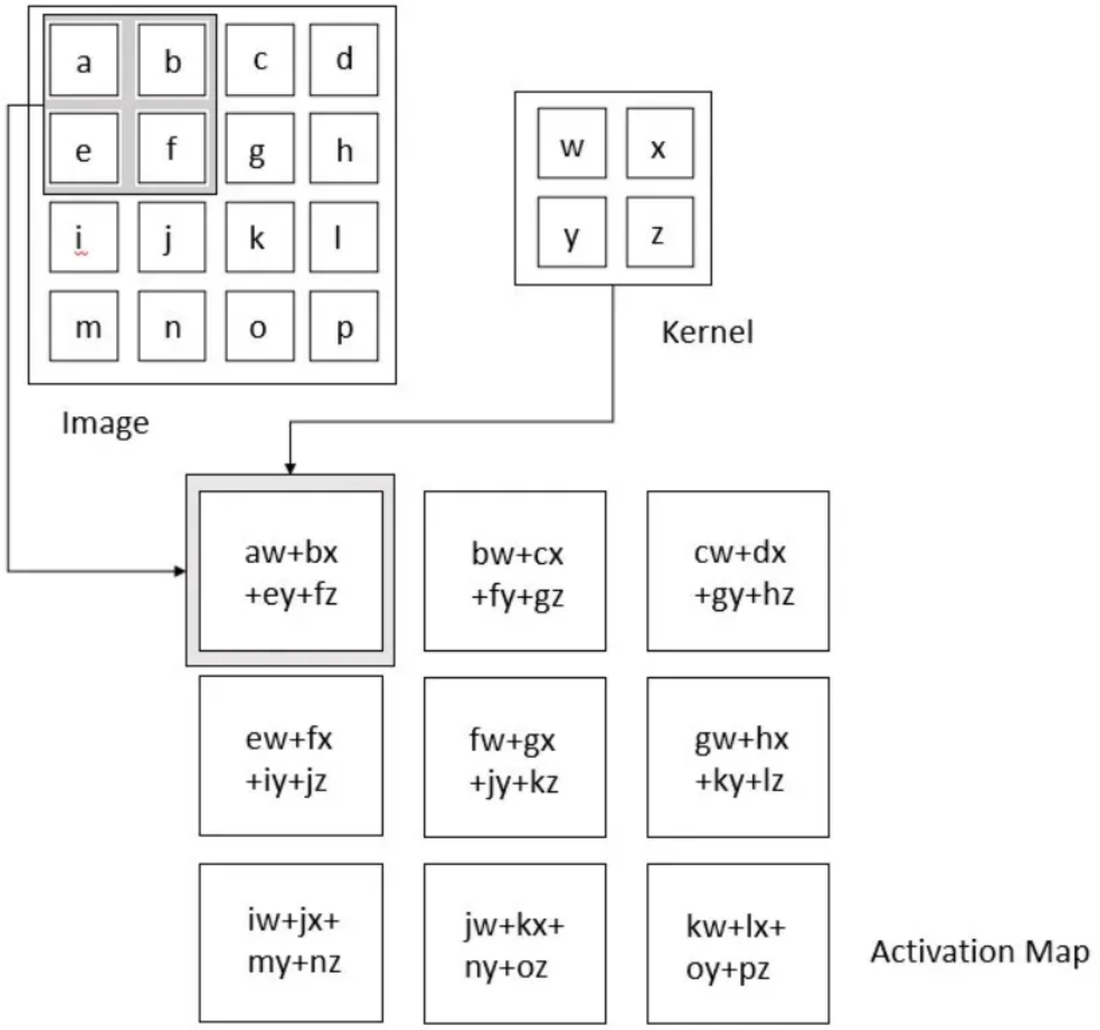

input
output

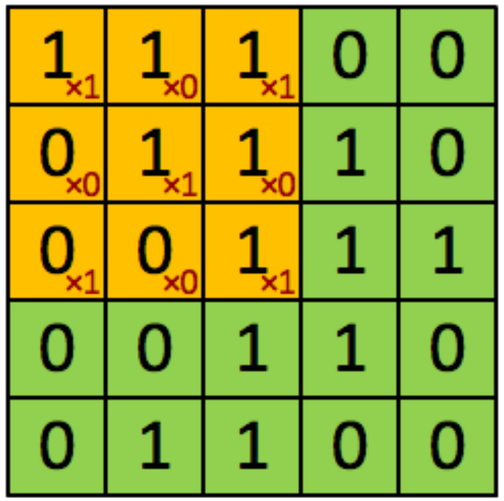
Elementos de una CNN

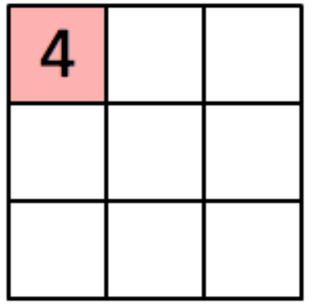
- Convolutional Layers
- Pooling Layers
- Fully-Connected Layers



Capas convolucionales







Capas convolucionales

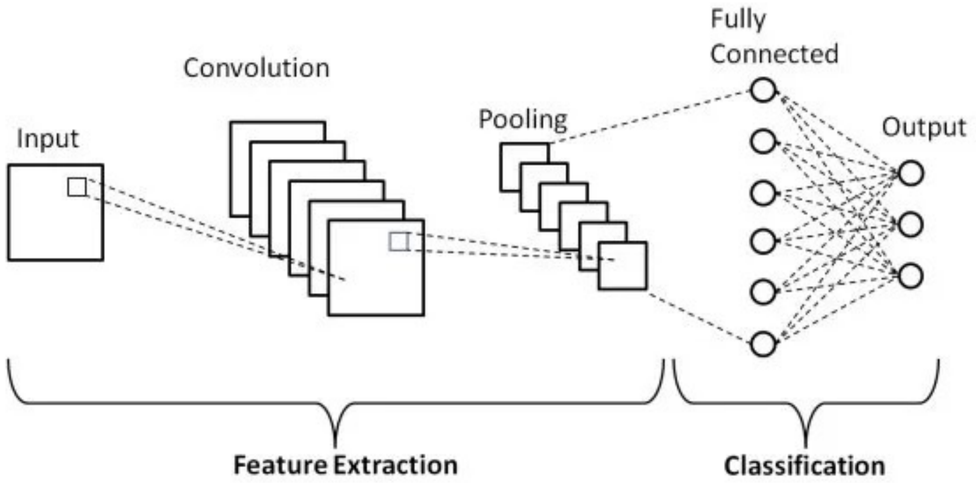
Parámetros

- Kernel size: It determines the size of the sliding window. It is generally recommended to use smaller window sizes, preferably odd values such as 1, 3, 5, and occasionally, rarely 7.

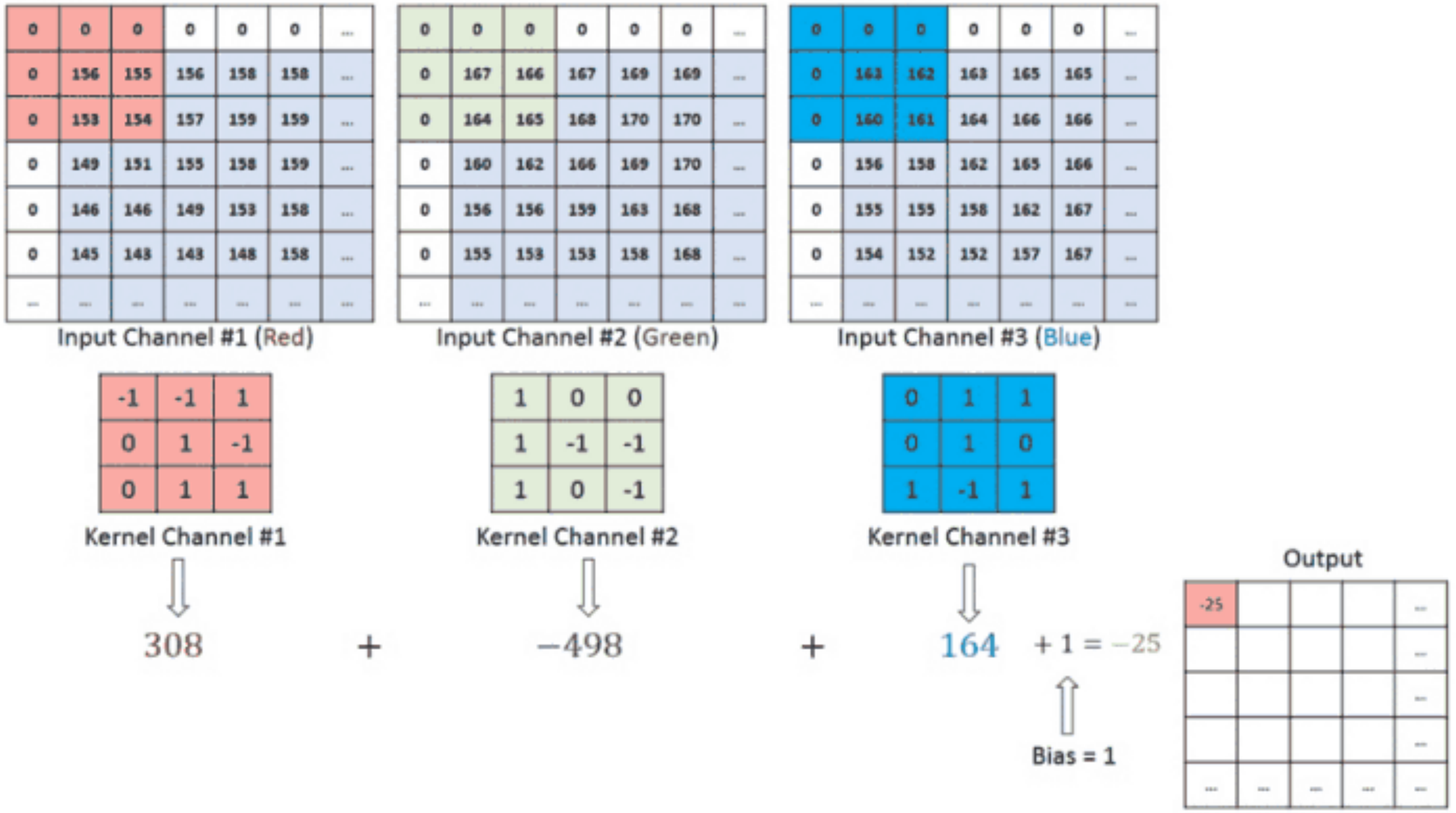
- Stride: The number of pixels the kernel window will move during each step of convolution. Typically, it is set to 1 to ensure that no locations are missed in an image. However, it can be increased if the intention is to simultaneously reduce the input size.

- Padding: Padding refers to the technique of adding zeros to the border of an image. By applying padding, the kernel can fully filter every position of an input image, ensuring that even the edges are properly processed.

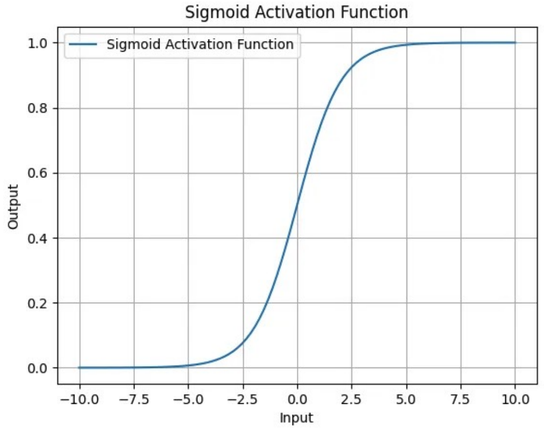
- Number of filters /Depth: The number of filters in a convolutional layer determines the number of patterns or features that the layer will seek to identify. In other words, it governs the number of distinct characteristics or elements that the convolutional layer will focus on detecting.

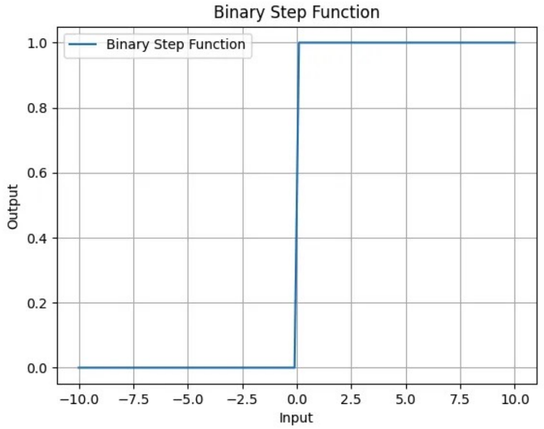


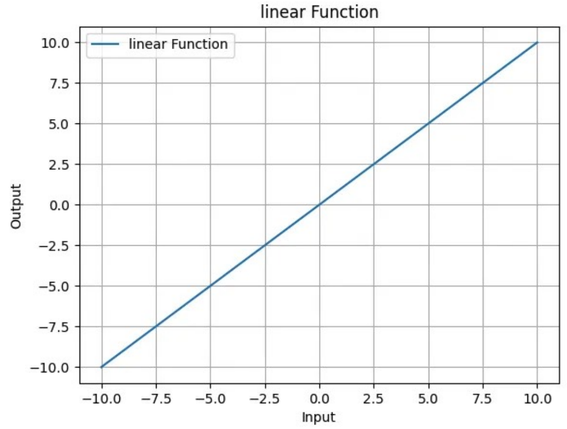
Entradas multiespectraules

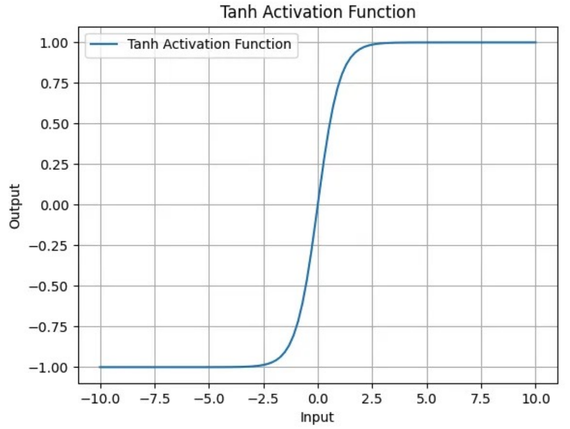


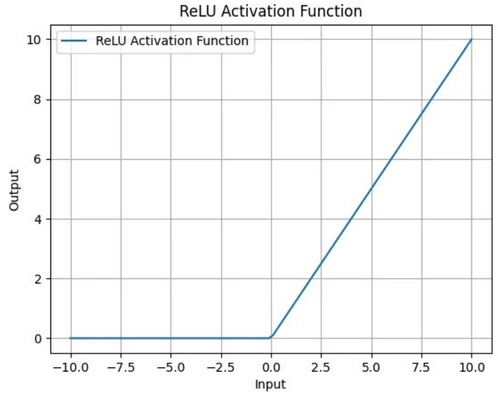
Funciones de activación

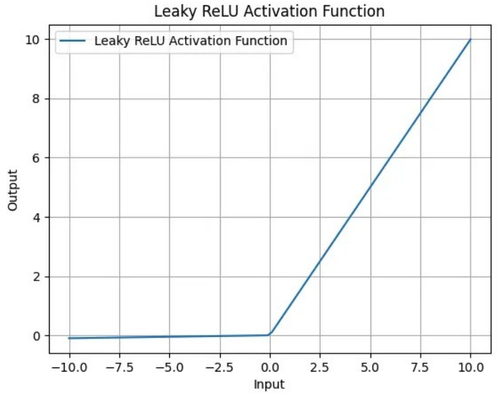


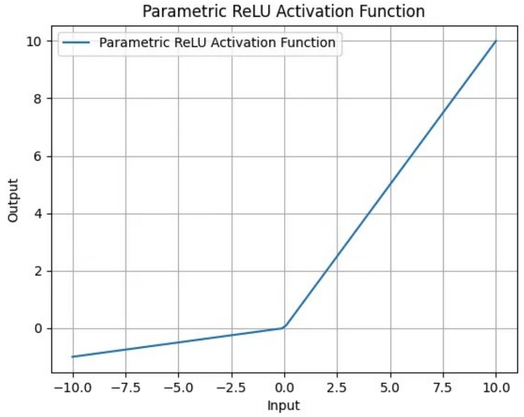


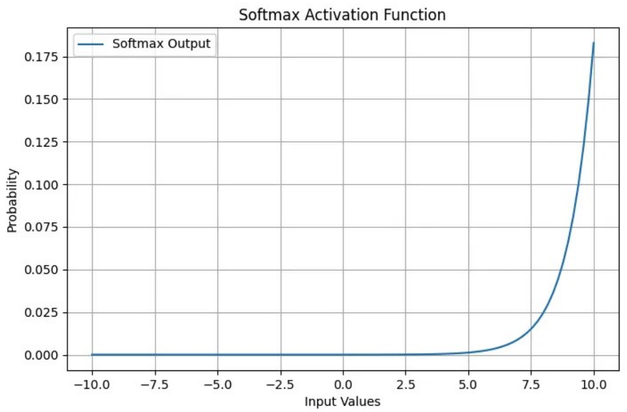






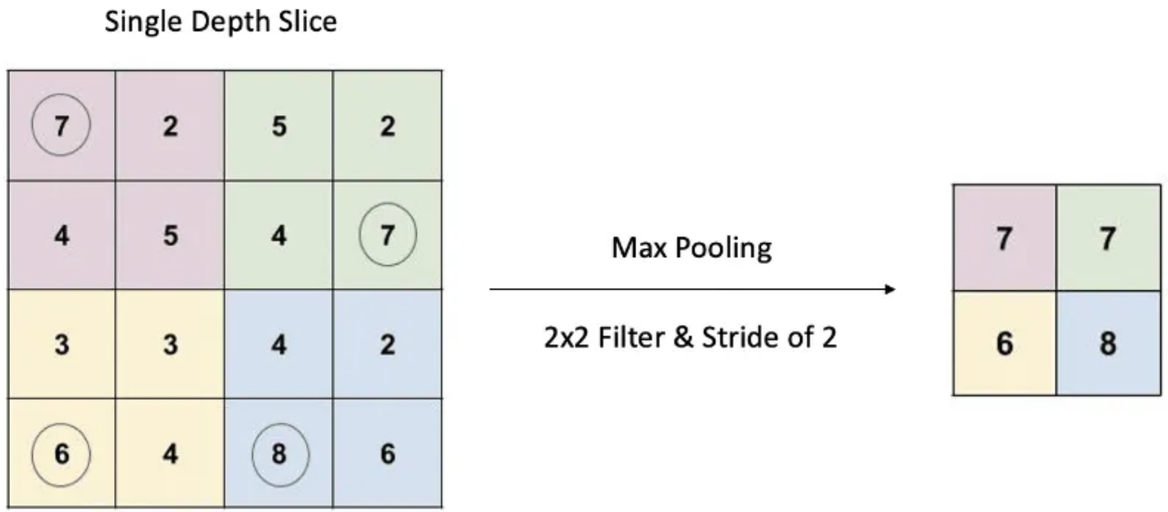




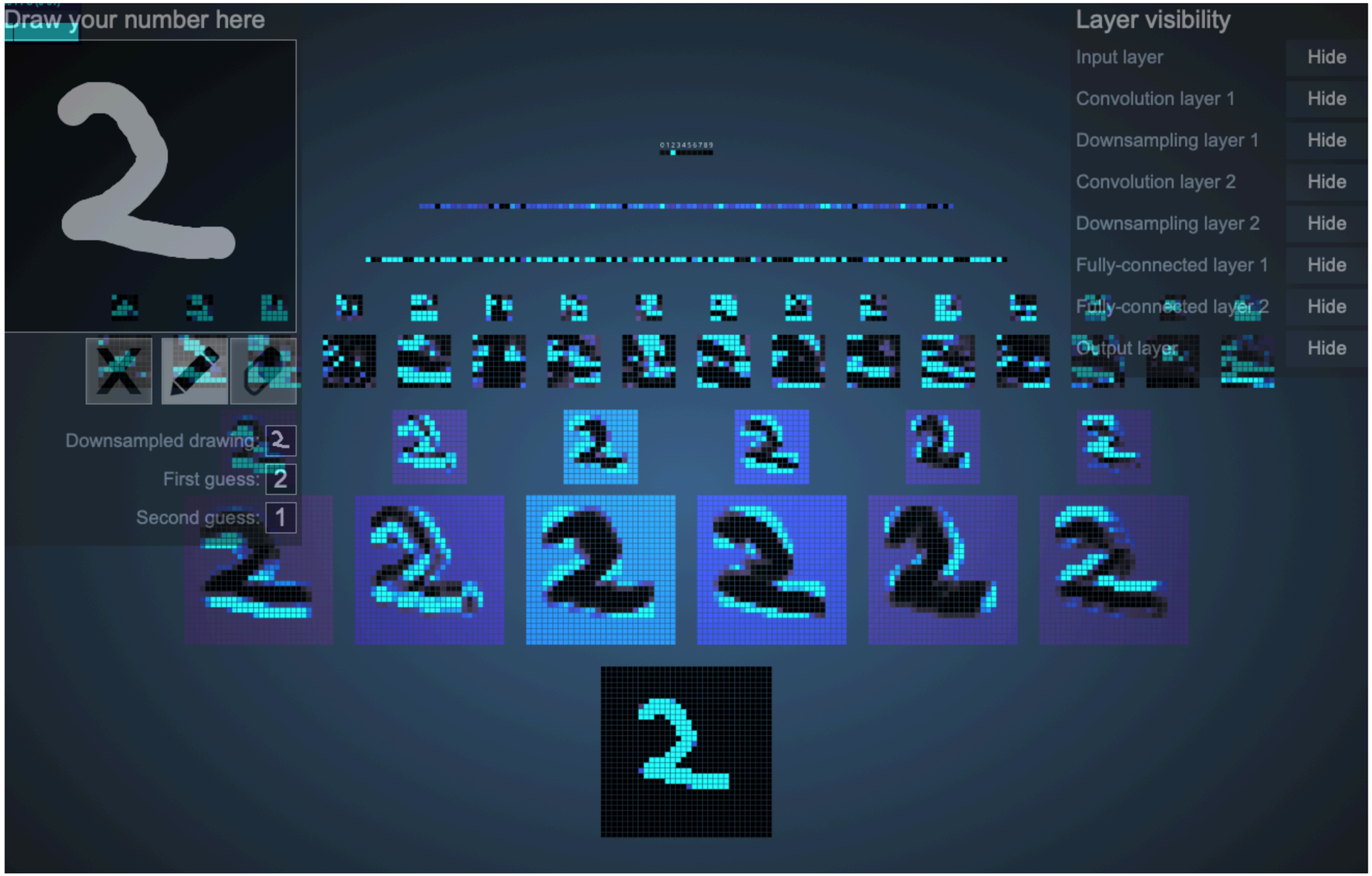


Capas de pooling

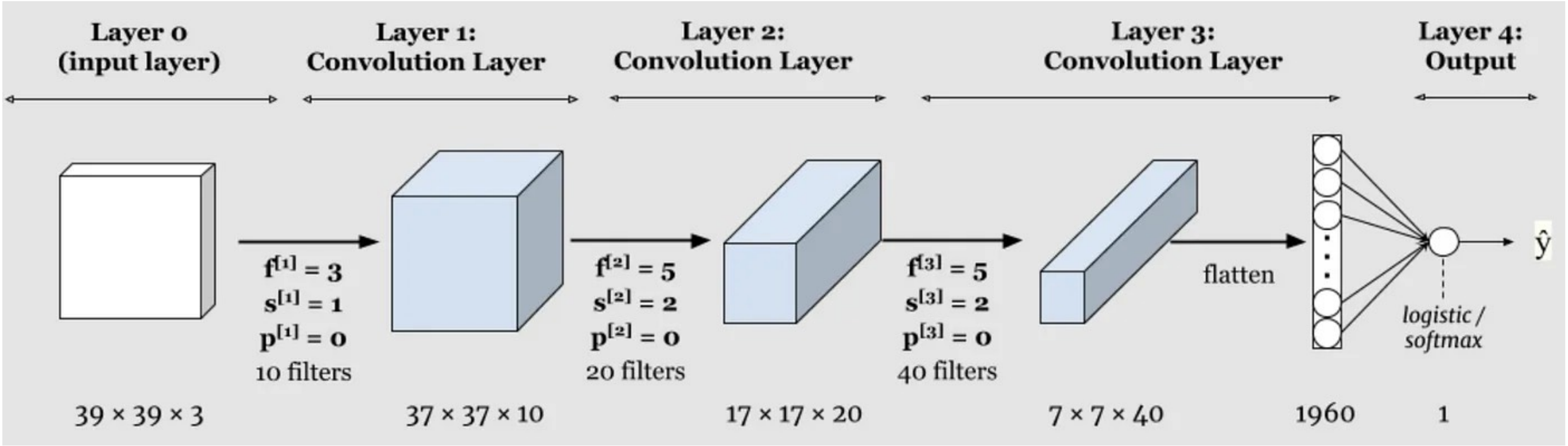
- **Max Pooling:** It selects the pixel with the maximum value to send to the output array.
- **Average pooling:** It calculates the average value within the receptive field to send to the output array.



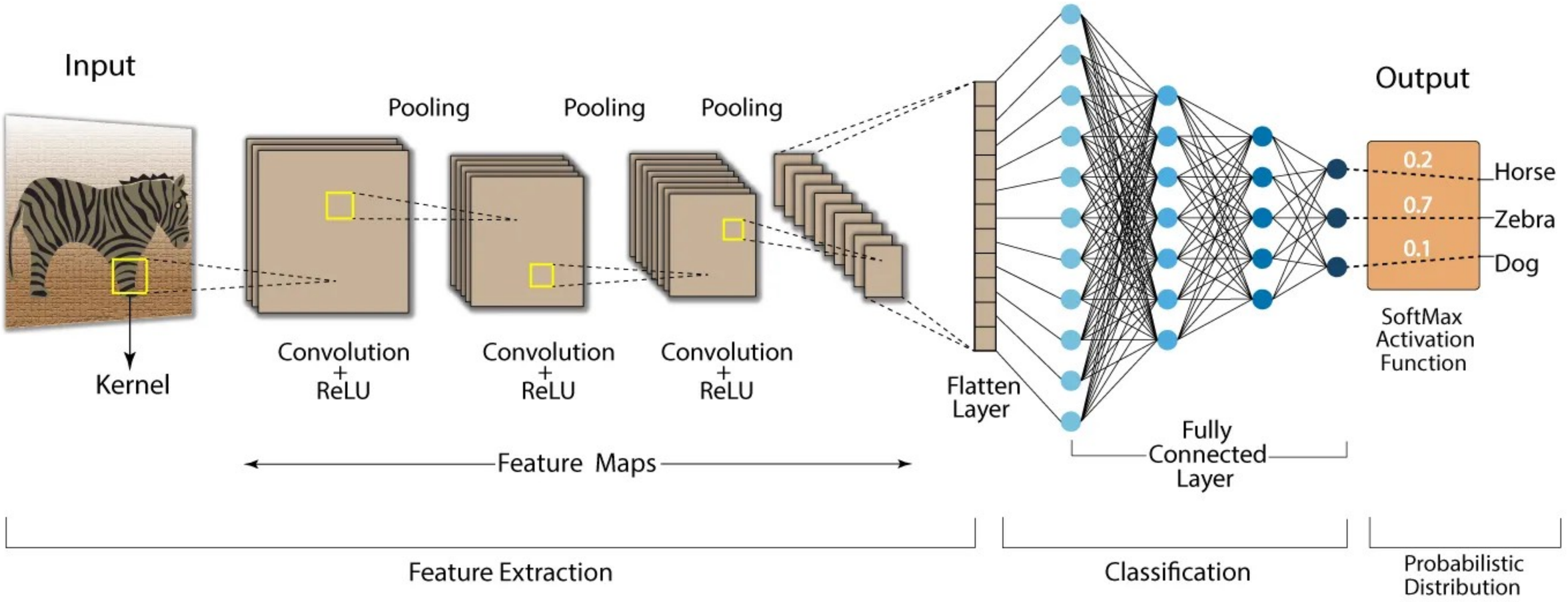
Arquitectura



Arquitectura



Arquitectura



Arquitectura Unet