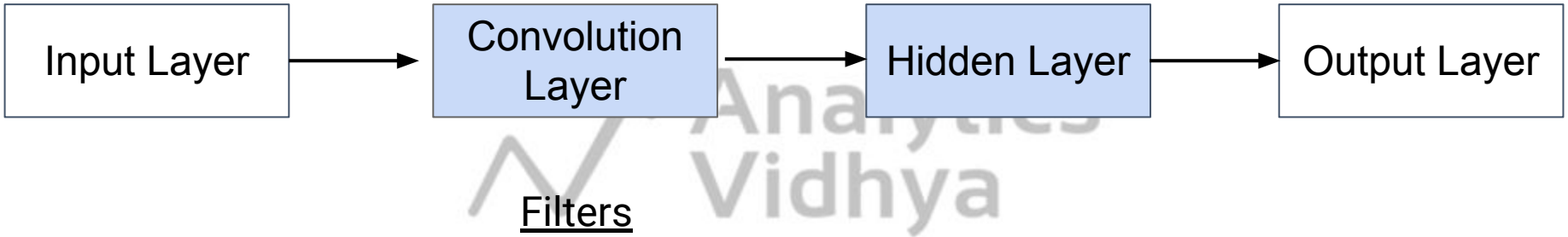
Forward Propagation in Convolutional Neural Network

CNN Structure

CNN Structure



CNN Structure

Weight and Bias

CNN Structure

Filters

Weight and Bias

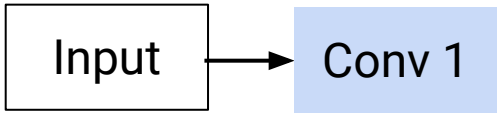
Forward Propagation in CNN

Input

Input = X

X = [100x22x22]

Forward Propagation in CNN



Input = X Z_1 =conv(X, f)

X = [100x22x22] *f* = [3 x 3]

Z_1 = [100x20x20]

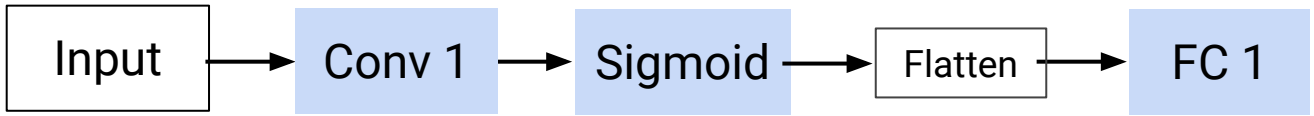
Forward Propagation in CNN

Input = X Z_1 =conv(X, f) H_1 = sigmoid(Z_1)

X = [100x22x22] *f* = [3 x 3] **H_1 = [100x20x20]**

Z_1 = [100x20x20]

Forward Propagation in CNN

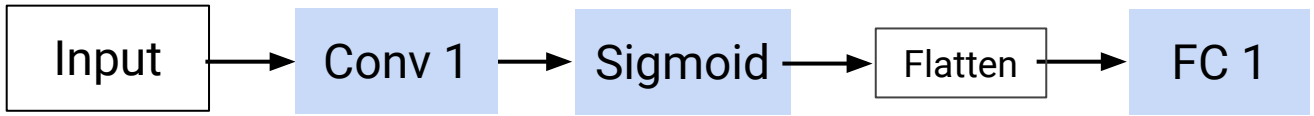


Input = X $\quad Z_1 = conv(X, f) \quad H_1 = sigmoid(Z_1) \quad Z_2 = W^T . H_1 + b$

X = [100x22x22] $\quad f$ = [3 x 3] $\quad H_1$ = [100x20x20] $\quad$ **H_1 = [400 x 100]**

Z_1 = [100x20x20]

Forward Propagation in CNN

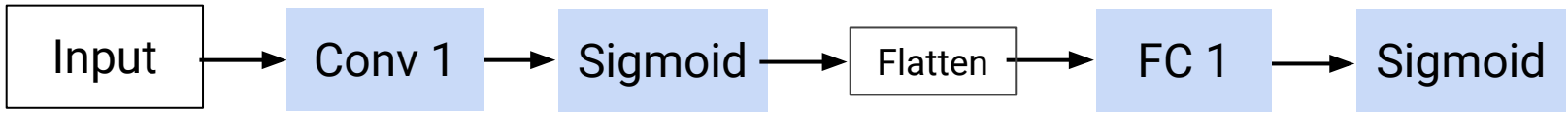


Input = X $\quad Z_1 = conv(X, f)$ $\quad H_1 = sigmoid(Z_1)$ $\quad Z_2 = W^T \cdot H_1 + b$

X = [100x22x22] $\quad f$ = [3 x 3] $\quad H_1$ = [100x20x20] $\quad H_1$ = [400 x 100] $\quad W^T$ = [1 x 400]

Z_1 = [100x20x20] $\quad$ **Z_2 = [1 x 100]**

Forward Propagation in CNN



Input = X $\quad Z_1 = conv(X, f)$ $\quad H_1 = sigmoid(Z_1)$ $\quad Z_2 = W^T . H_1 + b$ $\quad O = sigmoid(Z_2)$

X = [100x22x22] $\quad f$ = [3 x 3] $\quad H_1$ = [100x20x20] $\quad H_1$ = [400 x 100] $\quad W^T$ = [1 x 400] $\quad$ **O = [1 x 100]**

Z_1 = [100x20x20] $\quad Z_2$ = [1 x 100]

Forward Propagation in CNN

Input = X $\quad Z_1 = conv(X, f)$ $\quad H_1 = sigmoid(Z_1)$ $\quad Z_2 = W^T . H_1 + b$ $\quad O = sigmoid(Z_2)$

X = [100x22x22] $\quad f$ = [3 x 3] $\quad H_1$ = [100x20x20] $\quad H_1$ = [400 x 100] $\quad W^T$ = [1 x 400] $\quad$ **O = [1 x 100]**

Z_1 = [100x20x20] $\quad Z_2$ = [1 x 100]

Parameters in CNN

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Input = X Z_1 =conv(X, f) H_1 = sigmoid(Z_1) $Z_2 = W^T . H_1 + b$ O = sigmoid(Z_2)

Parameters in CNN

Input = X $Z_1 = conv(X, f)$ $H_1 = sigmoid(Z_1)$ $Z_2 = W^T . H_1 + b$ $O = sigmoid(Z_2)$

Thank You!