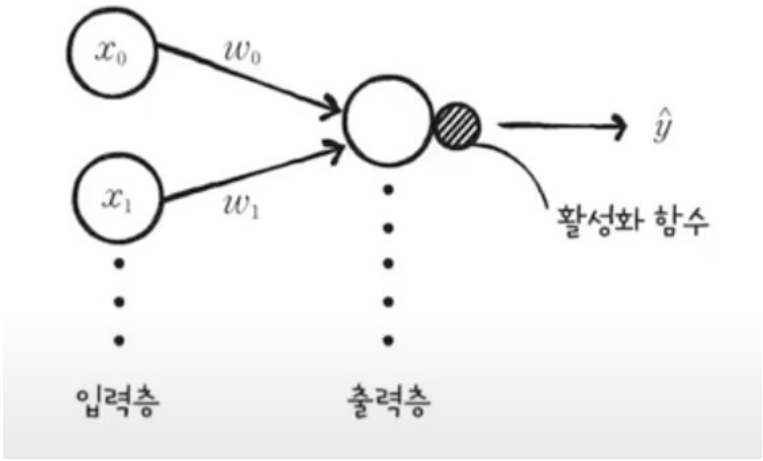
디지털 영상처리 연구실 연구보고서

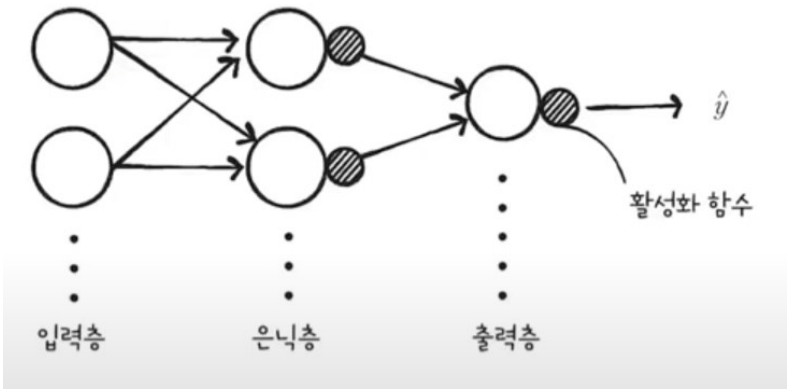
김우헌

#단일층 신경망



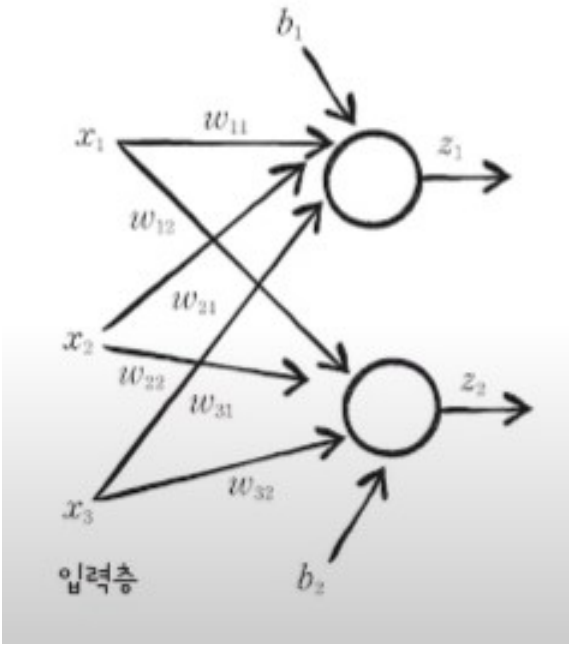
$$w_1x_1+w_2x_2+b=z$$

#심층 신경망(딥러닝)



##2개의 층을 가진 신경망

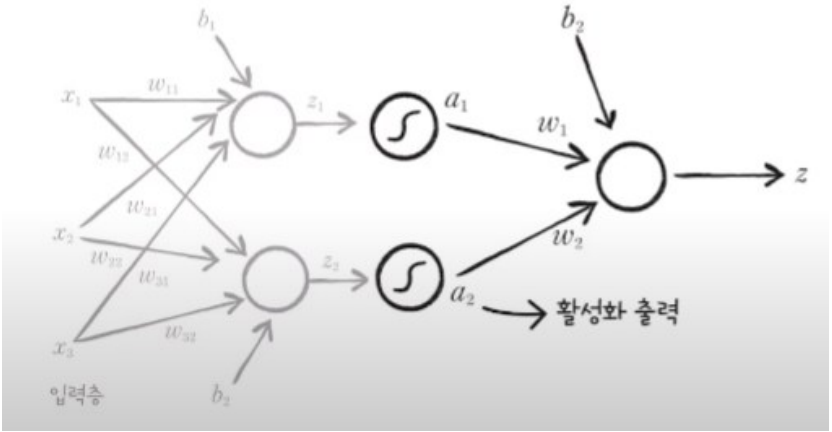
#은닉층



$$x_1w_{11}+x_2w_{21}+x_3w_{31}+b_1=z_1$$
$$x_1w_{12}+x_2w_{22}+x_3w_{32}+b_2=z_2$$

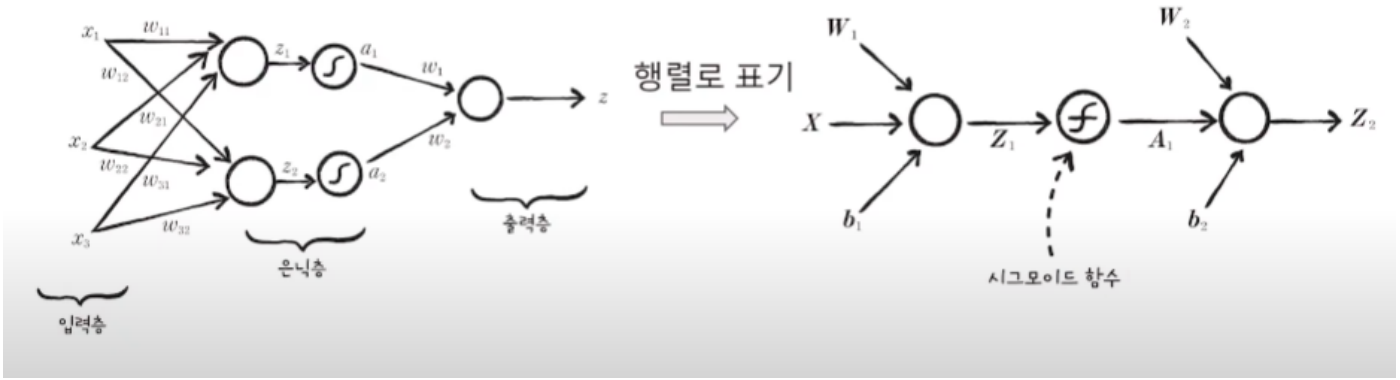
전체 샘플일 경우:$\boldsymbol{XW}_1+\boldsymbol{b}_1=\boldsymbol{Z}_1$

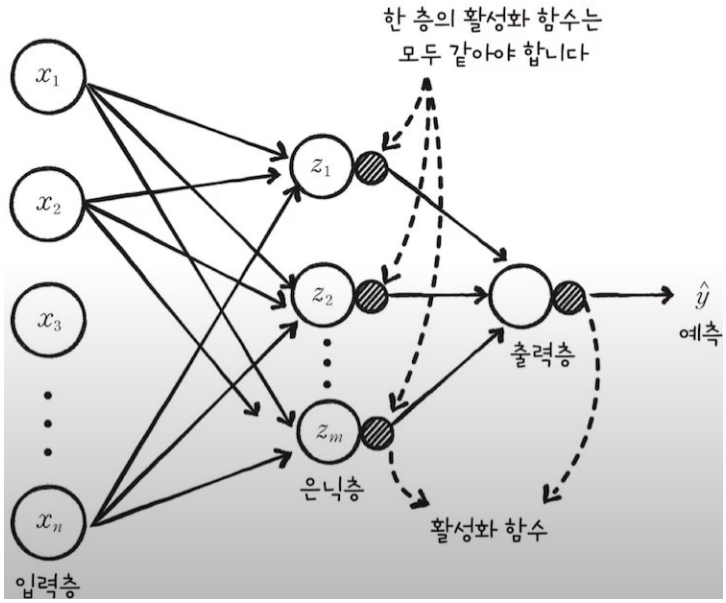
#출력층



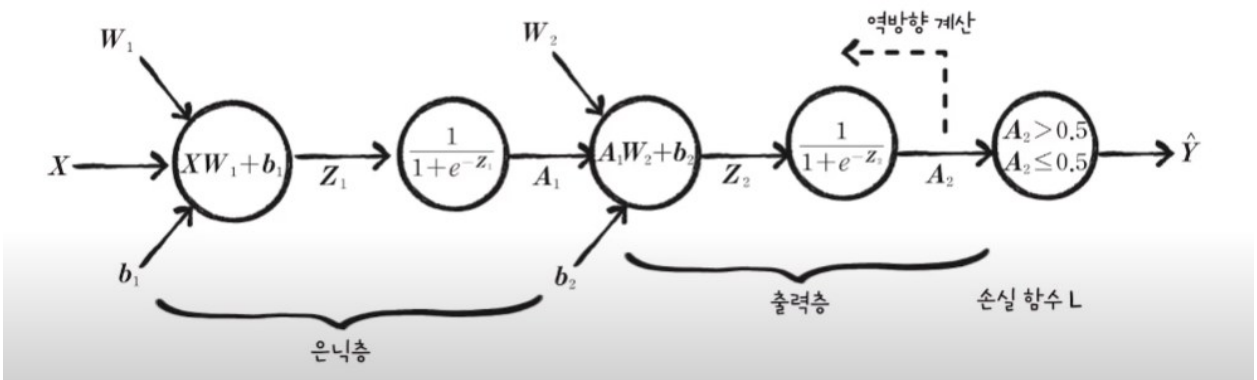
$$a_1w_1+a_2w_2+b_2=z$$

전체 샘플일 경우:$\boldsymbol{A}_1\boldsymbol{W}_2+\boldsymbol{b}_2=\boldsymbol{Z}_2$

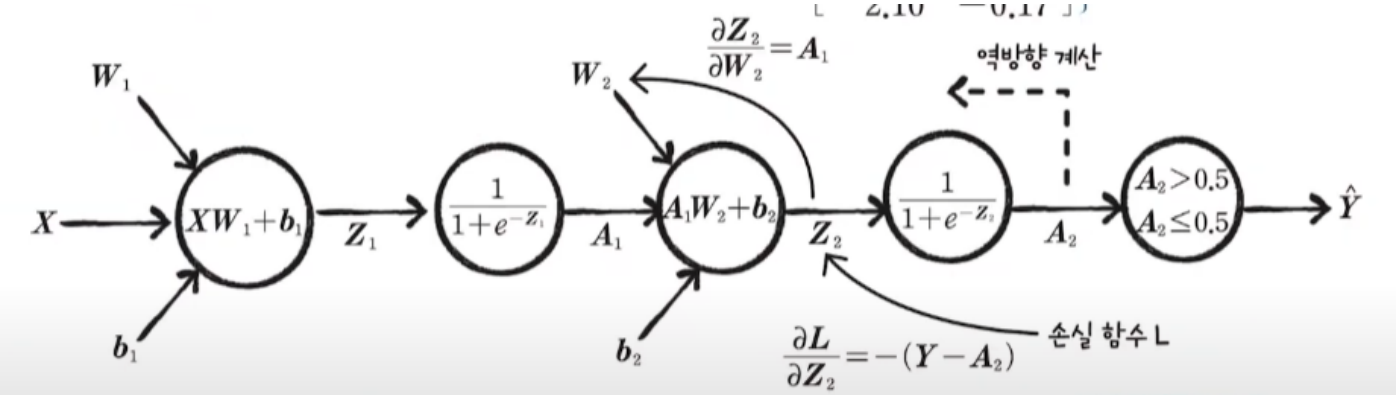




#심층 신경망에서 경사하강법



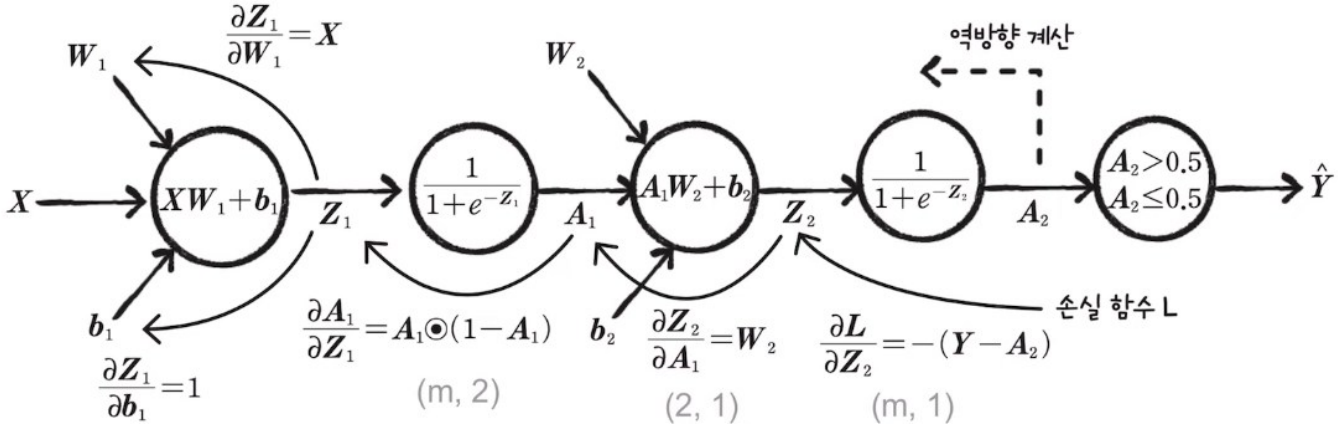
#가중치 업데이트(출력층)



$$\frac{\partial L}{\partial W_2}=\frac{\partial L}{\partial Z_2}\frac{\partial Z_2}{\partial W_2}=A_1^T(-(Y-A_2))$$

->W2값 업데이트!

#가중치 업데이트(은닉층)



$$\frac{\partial L}{\partial Z_2}\frac{\partial Z_2}{\partial A_1}\frac{\partial A_1}{\partial Z_1}=-(Y-A_2)W_2^T\odot A_1\odot(1-A_1)$$

->W1값 업데이트!

#다중분류