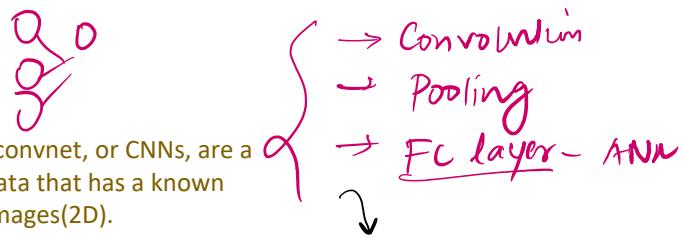


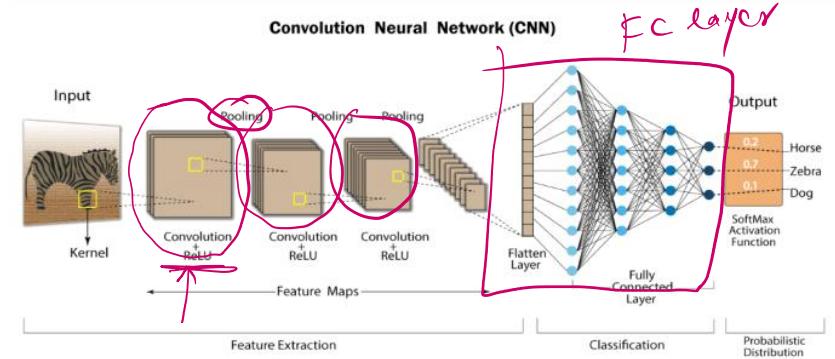
What is a CNN?

17 August 2022 06:47

Convolutional neural networks, also known as convnet, or CNNs, are a special kind of neural network for processing data that has a known grid-like topology like time series data(1D) or images(2D).



→ ANN → Convolution
CNN → convolution \otimes
ANN → matrix mult.



Inspirations

↳ visual cortex

1998 Yann LeCun → AT&T →
↳ Microsoft → OCR hand writing $\xrightarrow{\text{recog}}$ CNN

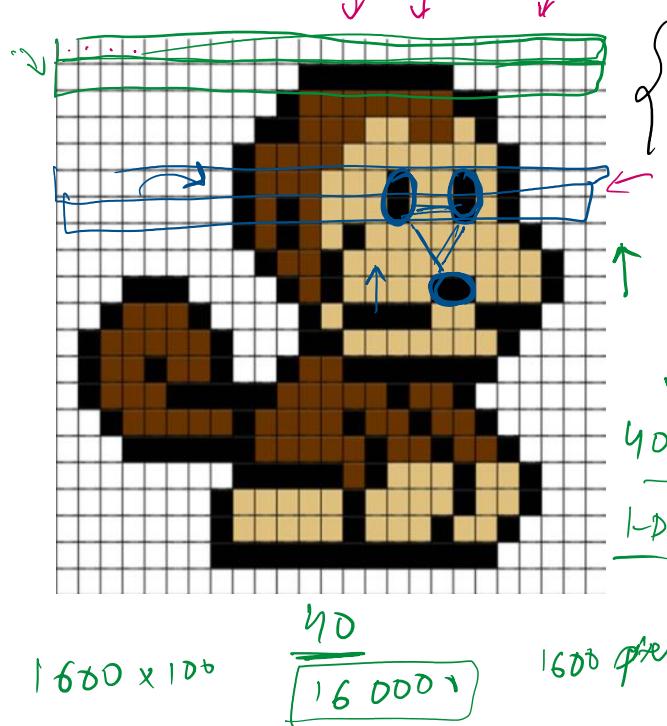
↳ facial recos self driving $\xrightarrow{\text{CNN}}$ $\xrightarrow{\text{RNN}}$

Why not use ANN?

17 August 2022 06:47

pixels 2D grid

CNN vs ANN

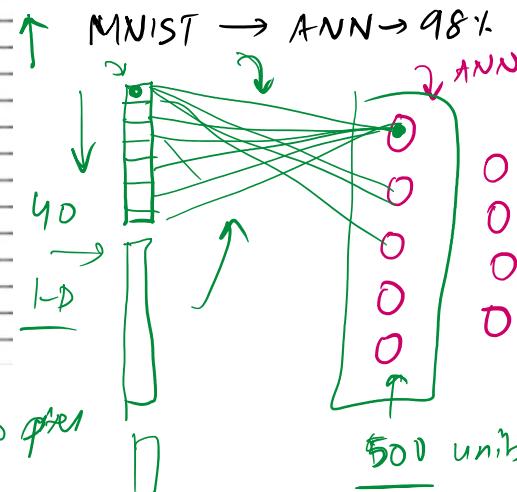


1. High Computation Cost ✓ 1D
2. Overfitting →
3. Loss of imp info like spatial arrangement of pixels

40x40 image

y

MNIST \rightarrow ANN \rightarrow 98%



ANN

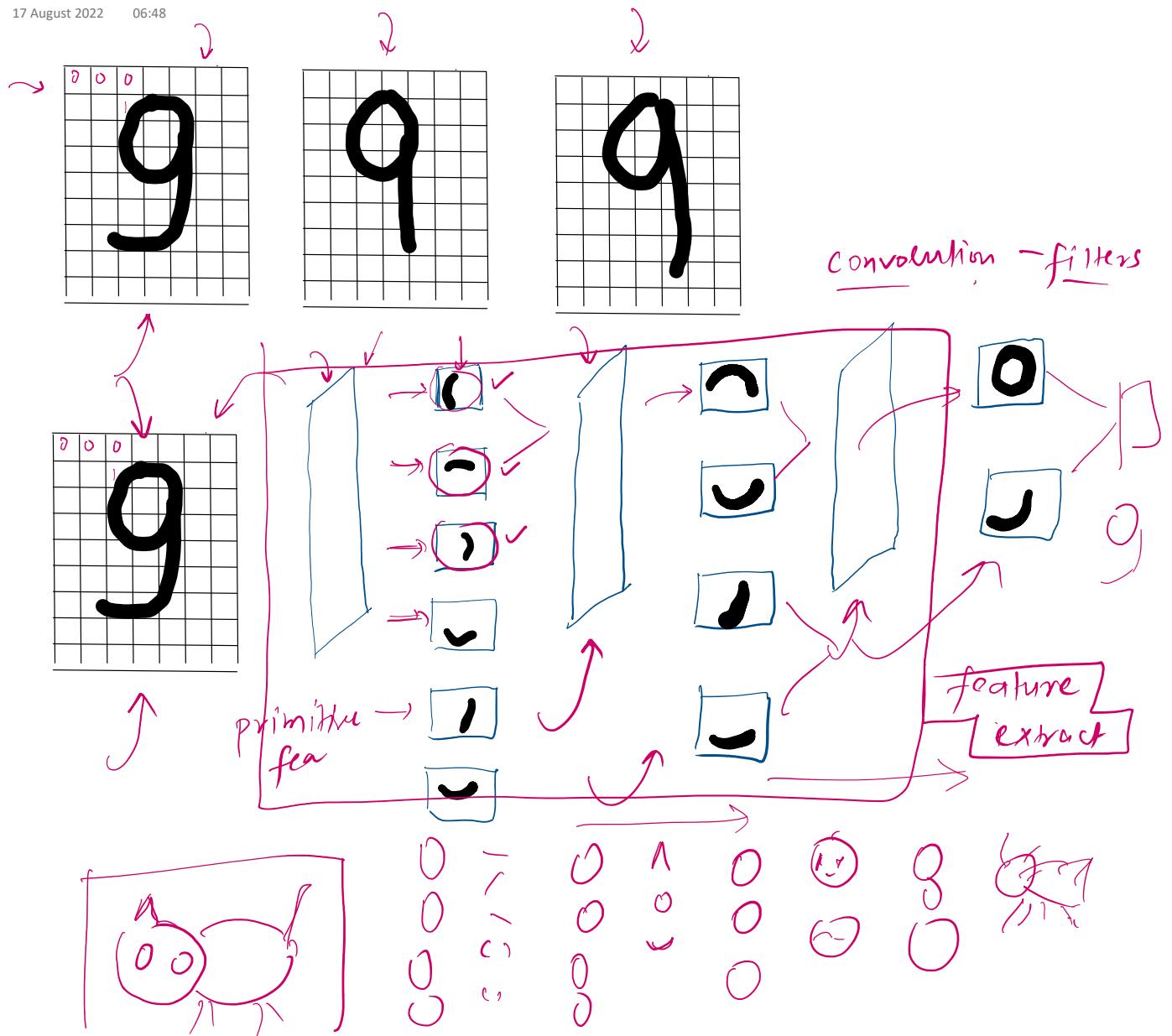
1000×1000

Overfitting

$1000 \times 1000 \times 500$

CNN Intuition

17 August 2022 06:48

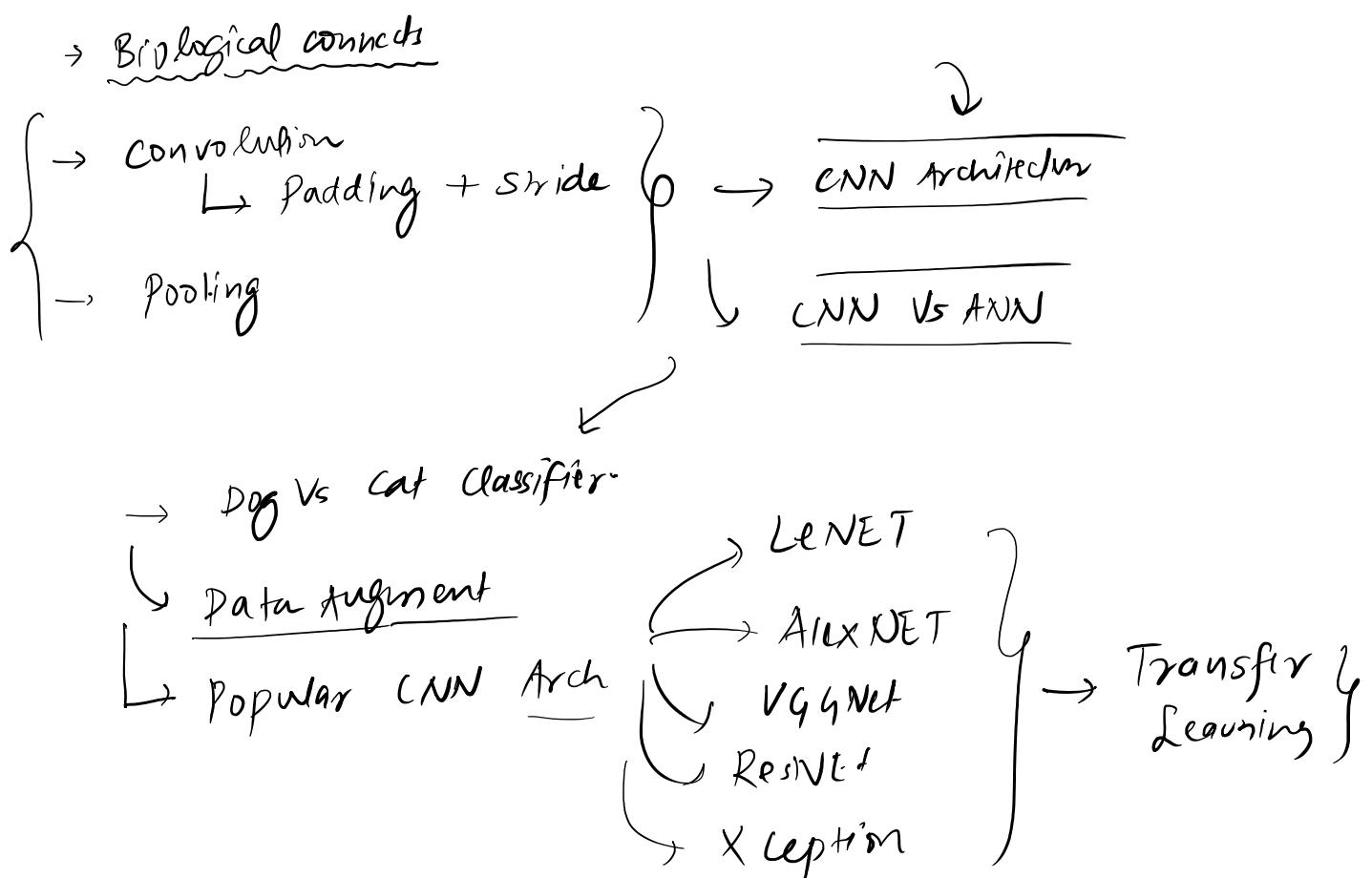


CNN Applications

17 August 2022 06:48

Roadmap

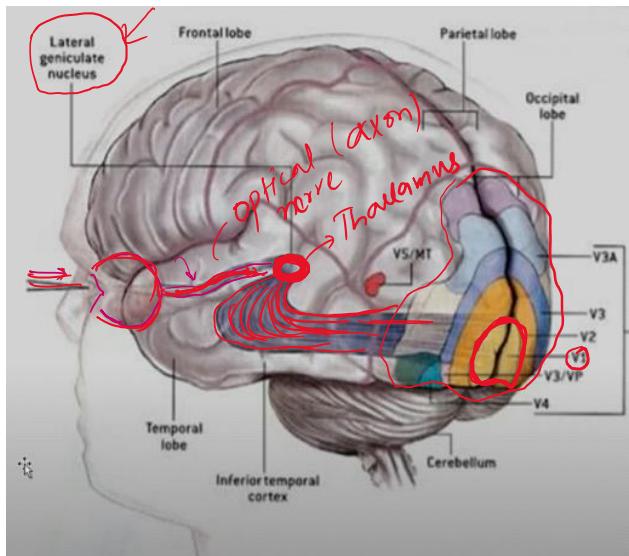
17 August 2022 06:48



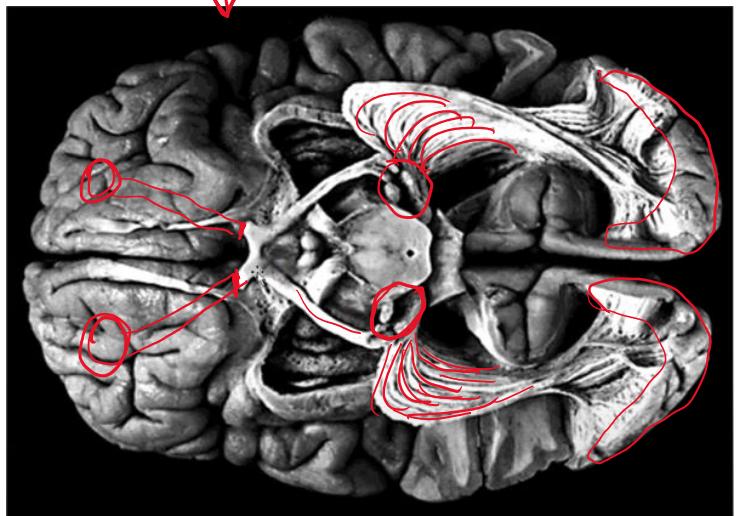
Human Visual Cortex

18 August 2022 16:05

2D sketch primary visual cortex

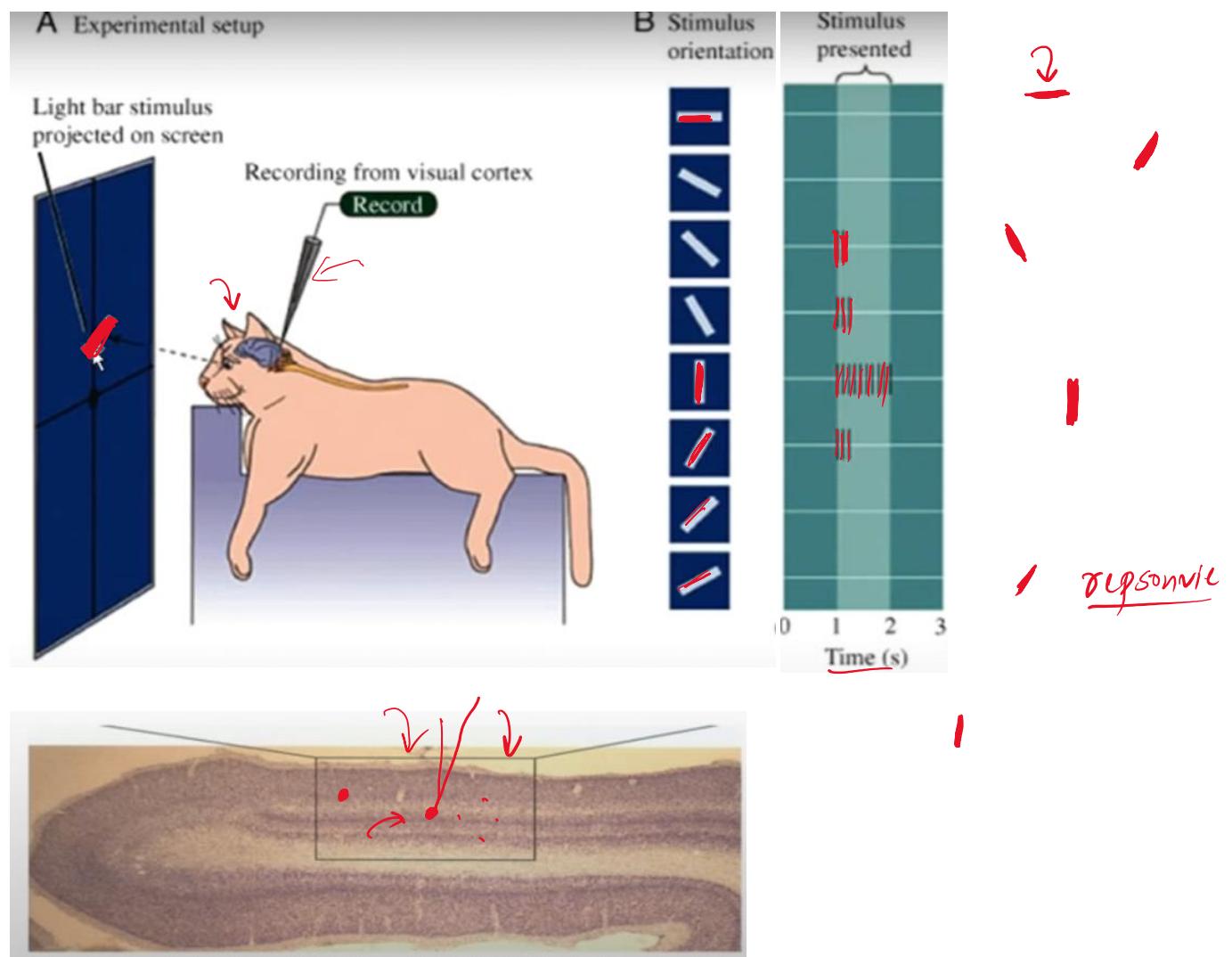


actual brain



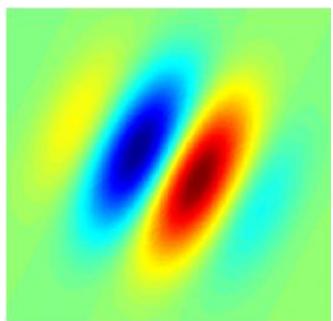
The Experiment

18 August 2022 16:09

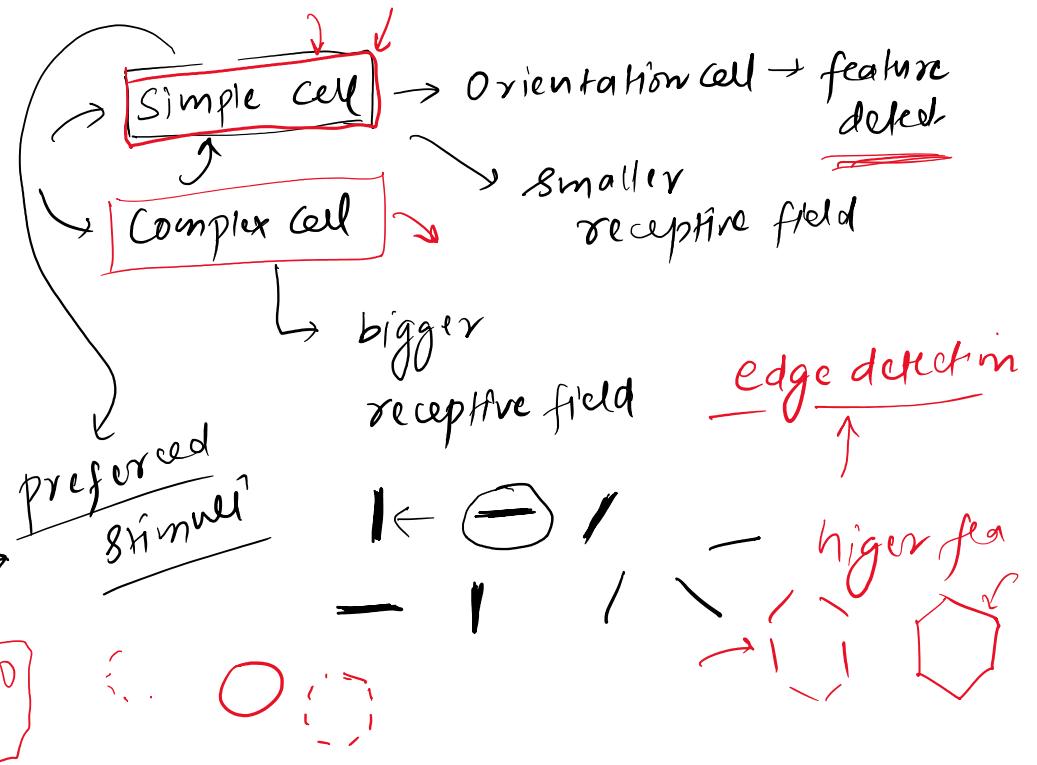


Conclusion

18 August 2022 17:57

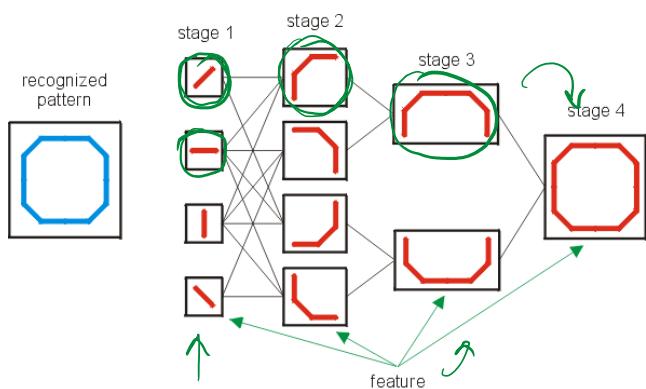


↑
edges

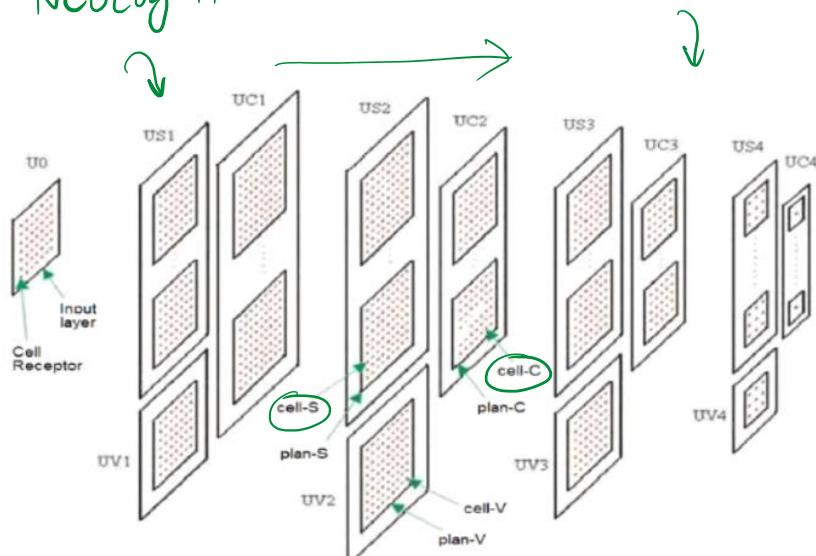


Development

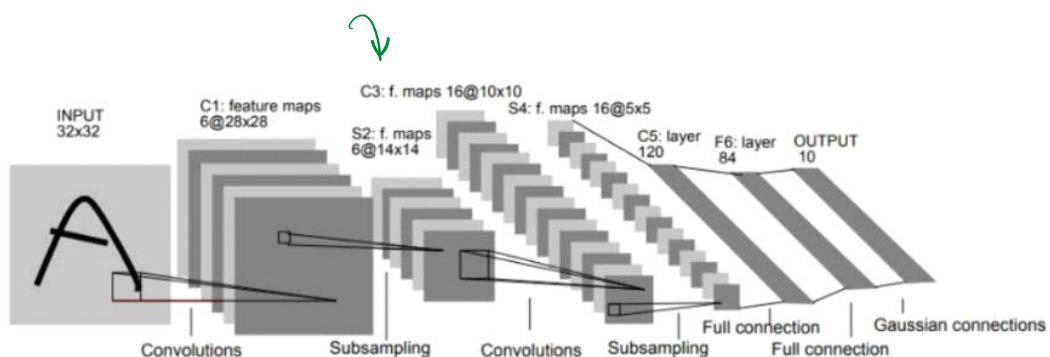
18 August 2022 16:15



Neocognitron → Fukushima



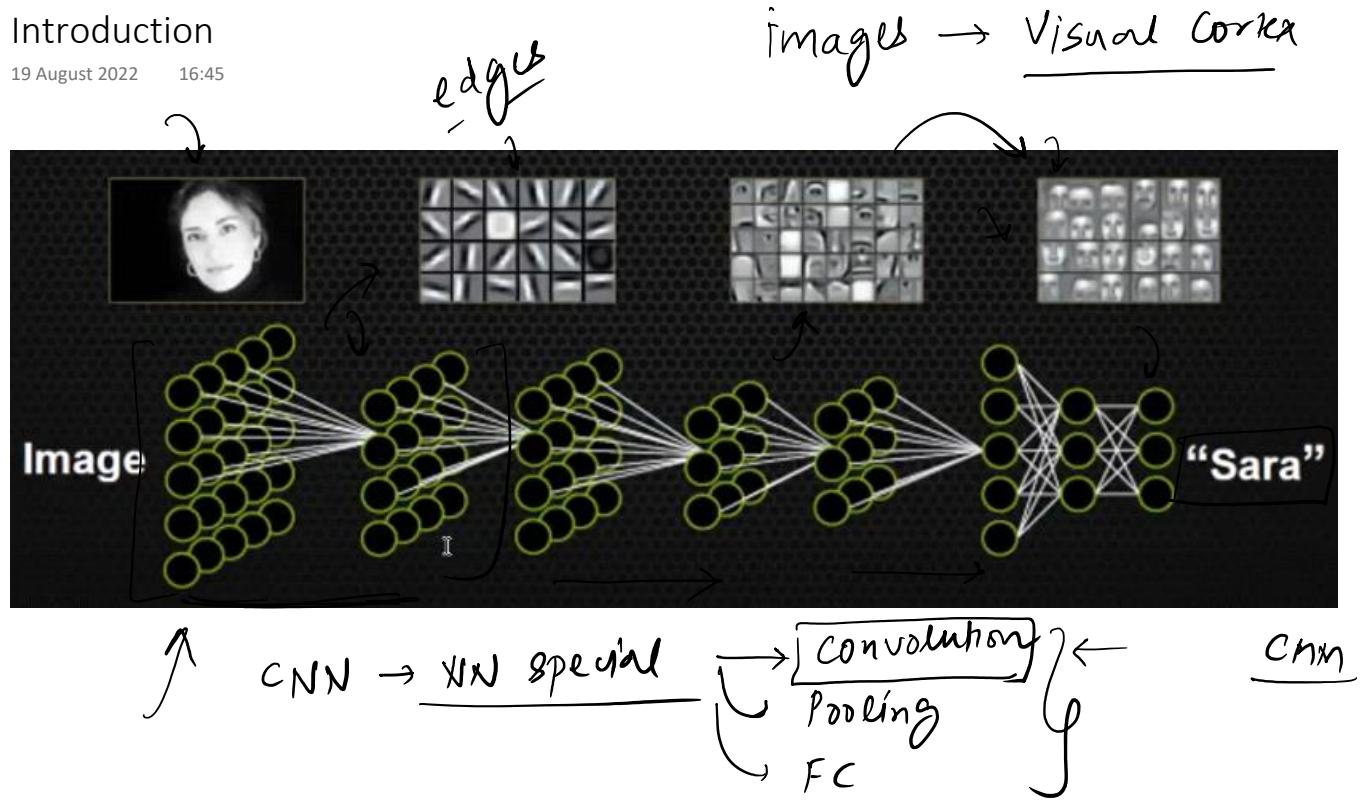
Yann LeCun → CNN → Backprop convolution



2012 → AlexNET → ImageNET → CNNs

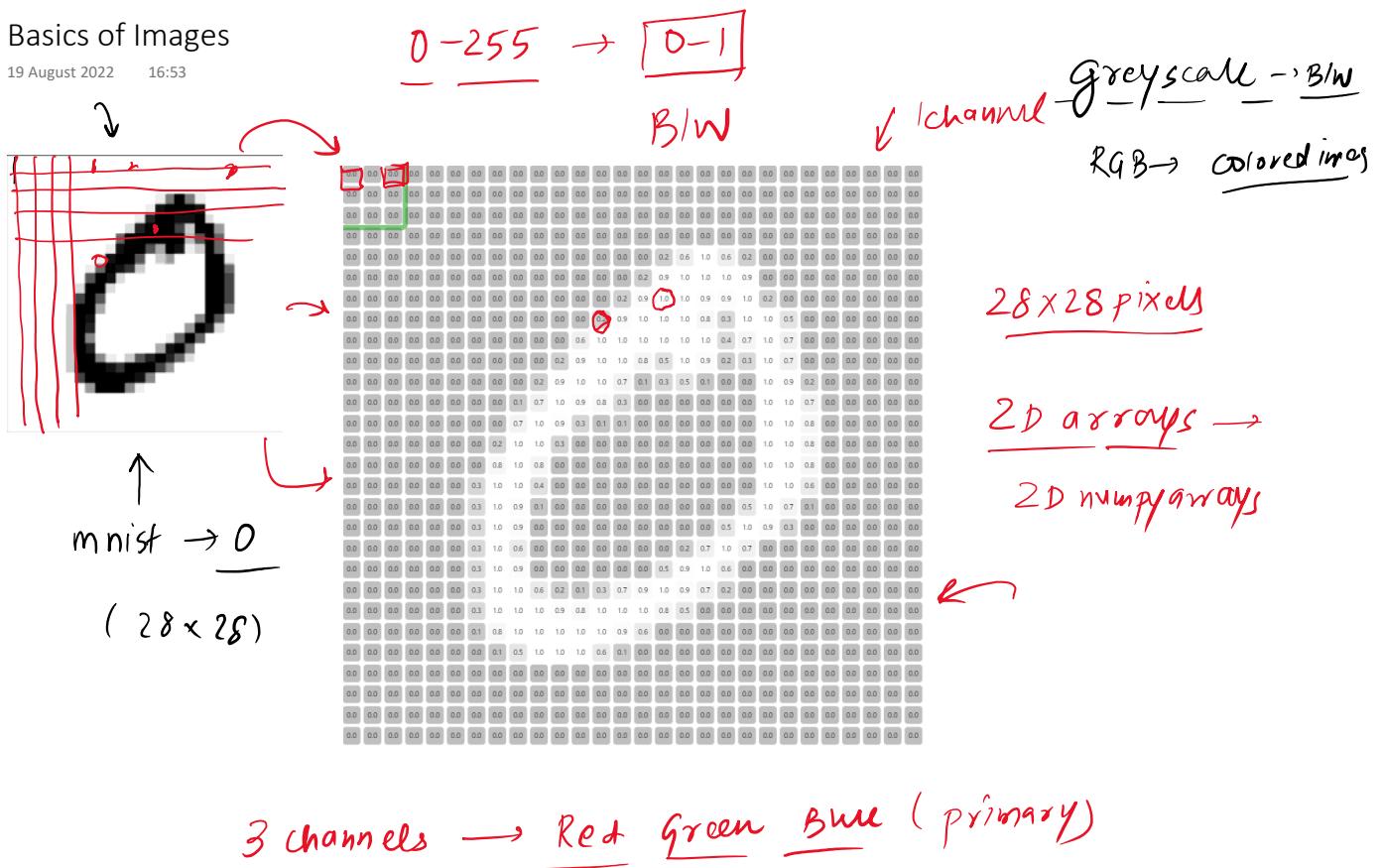
Introduction

19 August 2022 16:45



Basics of Images

19 August 2022 16:53



3 channels → Red Green Blue (primary)

