- What are middel layers doing?

· They are learning patterns, they are learning the patterns of the different digits

· Like what makes up a 9 a circle and stick. A circle by it self thats a zero. The position of there matter

· in a perfect NN one layer would pick up on the patterns and The one before it the edges that make up those pattern like circle stick etc

· The these patterns influence the out put

$$9 = O + 1 \quad , \quad 8 = O + O \quad \left(\begin{array}{c} position \ of \\ Subcomponts \end{array}\right)$$
matters

▪ That we can easaly geuss the image from these.

· but we need to know what a "O" is Like what pixels make up a "O" ie freer recognize Sub components

· this can break down into anolther. Subcompont problem

· Same for all subpatterns

$O = \ulcorner \urcorner + / + \backslash + ($

· find all the edges that make a "O"

final layers higest activation is last neuron corresponding with 9 The 3rd layer told this out put lay or the circle and stick present most likly means a 9

The last layers activations indicates to the third layer that a circle and stick is present based on the 34 edges given

second layer finds all edges in that make up the edges in the imges

given 9

784

· The problem gets easier and simpler each layer that s the point. until last layer gives ans