11) FFNs

Feedforward Networks (FFNs)

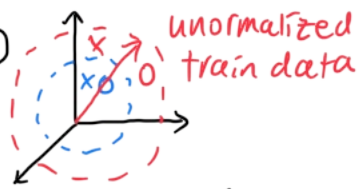
- The type of ANNs we've been working with
  - **Fully connected**: each node in a layer projects to each node in next layer
  - **Feedforward**: information propagates from input to output via activation

Loss vs. Accuracy

- Former's curve shows whether model is learning effectively
  Latter's numeric value is the metric u care

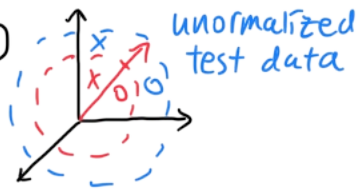
Why Normalize?

- Mis-normalization : ① unormalized train data



horrible hyperplane

② unormalized test data



okay hyperplane

  - so always normalize both train & test

Limitations of FFNs

① **Scrambled data**: "pixels" of each data is shuffled within the array
- Observation: FFNs perform equally well on scrambled vs. unscrambled

② **Shifted data**: rolled ($y\uparrow$ or $\rightarrow x$) each data by certain pixel
- Observation: FFNs perform poorly on shifted

- Conclusion: FFNs do NOT leverage spatial information of data
  ② breaks the pattern of FFN-vectorized image input